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A Model for Easily Incorporating Team-Based Learning into Nursing Education

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Abstract

A sense of urgency exists among nurse educators to determine the best possible teaching strategies to create a rich, engaging learning environment for students. With the calls for transformation, innovation, and excellence in nursing education from the American Association of Colleges of Nursing, the National Council of State Boards of Nursing, and the National League for Nursing, educators may determine that current teaching strategies fall short. Team-based learning, an innovative teaching strategy, offers educators a structured, student-centered learning environment and may be effective in teaching necessary skills to students. An overview of how this strategy fosters many of the essential concepts, such as critical thinking, professionalism, communication, and interprofessional teamwork, is presented. Additionally, this article offers a clearly delineated "recipe" for implementing team-based learning in the classroom. This innovative strategy has the potential to transform nursing education and provide a positive teaching and learning environment for both educators and students.

KEYWORDS: team-based learning, active learning strategies, teaching strategies, nursing education

The American Association of Colleges of Nursing (AACN) (2008a) revised the "Essentials of Baccalaureate Education for Professional Nursing Practice" in an effort to transform nursing education and the delivery of health care. Additionally, the National Council of State Boards of Nursing (NCSBN) is considering revising the NCSBN Model Education Rules to foster innovative approaches while continuing to regulate core education standards. An underlying assumption is that as knowledge and complexity in health care increase exponentially, newer models and strategies in nursing education are necessary (Odom, 2009). As early as 2003, the National League for Nursing (NLN) called for innovation that did not just address content but also integral relationships between faculty and students and called for nursing schools to "enact substantive innovation in schools, document the effects of the innovation being undertaken, and develop the science of nursing education upon which all practicing teachers can draw" (NLN, 2003, p. 3). This recognition by national bodies of the importance of transforming nursing education creates a mandate for nurse educators to meet this challenge. Schools of nursing across the country are in an ideal position to encourage, foster, and support transformative and innovative educational strategies.

Nursing faculty members recognize and value evidence-based innovation in teaching strategies to meet educational outcomes. With the calls from NCSBN, AACN, and NLN, a sense of urgency exists among nurse educators to determine the best possible methods to create a rich, engaging learning environment for students. The AACN's (2008b) call for the "intentional use of active, collaborative, and integrative learning strategies" (p. 3) supports a relatively new teaching and learning technique, team-based learning, that can assist nurse educators to meet the increasingly high demands of nursing education. This active learning strategy can foster a spirit of inquiry and community of scholars, a component of the "Nurse Faculty Tool Kit for the Implementation of the Baccalaureate Essentials" (AACN), as well as foster many essential concepts, such as critical thinking, professionalism, communication, and interprofessional teamwork. Recognizing time limits of today's busy faculty members, this article outlines a clearly delineated "recipe" for implementation of team-based learning. The strength of this structured teaching strategy is the simplicity and clarity of the implementation phases.

TEAM-BASED LEARNING

Although relatively new in nursing education, team-based learning offers a structured, student-centered learning strategy that focuses on active learning strategies. Nurse educators have used many active learning strategies, such as

discussion, group work, and the use of case studies, for decades in nursing education. However, due to insufficient time and inadequate structure of these activities, their limited use still exist in current nursing education. Team-based learning captures the strengths of active learning strategies while offering faculty members a structured, time-efficient implementation model (Barak, Lipson, & Lerman, 2006; Jeffries & Norton, 2005; Sims, 2006).

In the late 1970s, Dr. Larry Michaelsen developed team-based learning. At the time, he was a faculty member confronted with the challenge of teaching a business course to a large class of students. Although Michaelsen had used group activities effectively in smaller classrooms, he was now facing classrooms of 120 students. Instead of using lecture, he decided to use the class time for group activities. During the first semester in which Michaelsen initiated team-based learning, three obvious outcomes occurred: students found the learning strategy beneficial, the strategy enhanced learning, and Michaelsen actually had fun teaching (Fink & Parmelee, 2008).

Since that time, the strategy has been revised and used successfully in a variety of educational settings, including marketing (Hernandez, 2002; Thackeray & Wheeler, 2006), psychiatry (Touchet & Coon, 2005), accounting (Lancaster & Strand, 2001), and business (Baldwin, Bedell, & Johnson, 1997; Fink & Parmelee, 2008). Team-based learning has also been employed extensively in medical education (Dunaway, 2005; Haidet & Fecile, 2006; Haidet, O'Malley, & Richards, 2002; Nieder, Parmelee, Stolfi, & Hudes, 2005; Ortega, Stanley, & Snavely, 2006; Seidel & Richards, 2001; Thompson, Schneider, Haidet, Perkowski, & Richards, 2007). Although much of the available literature from other disciplines is expository, a majority of the studies do report positive student attitudes and student outcomes with the use of team-based learning (Haberyan, 2007; Haidet et al., 2002; Koles, Nelson, Stolfi, Parmelee, & DeStephen, 2005; Koles, Stolfi, Nelson, & Parmelee, n.d.; Levine et al., 2004; McInerney & Fink, 2003; Nieder et al., 2005; Touchet & Coon). Furthermore, several studies indicate that team-based learning results in higher levels of student engagement (Haidet et al.; Dana, 2007; Levine et al.; Seidel & Richards). These positive findings further encourage the application of team-based learning in other disciplines, including nursing.

Team-based learning has also been used in the professional setting to encourage interprofessional collaboration. Rider, Brashers, and Costanza (2008) employed team-based learning with a group of health care professionals to develop health care policies and presented the resulting work to members of congress in a public policy position paper.

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Faculty members have just recently begun to use team-based learning in nursing education and limited studies exist regarding its efficacy. However, results indicate that team-based learning is beneficial in teaching essential components in nursing education (Clark, Nguyen, Bray, & Levine, 2008).

CONCEPTUAL MODEL FOR TEAM-BASED LEARNING

The conceptual model for team-based learning, developed by Haidet, Schneider, and Onady (2008), focuses on learner engagement, a key concept in team-based learning (Parmelee, 2008). According to this model, learner engagement occurs in two interrelated, mutually strengthening areas: within course content and within teams. Learner engagement within course content occurs through individual pre-class preparation and review of the course content. Additionally, as the student participates during class activities and discussion, a deeper knowledge of the course content occurs. Learner engagement within teams occurs and strengthens as teams develop cohesiveness. Within the conceptual model for team-based learning, learner engagement is also encompassed by other concepts that may affect both the degree and quality of the learner engagement. The surrounding concepts which influence learner engagement include teacher decision regarding the design of the course; individual characteristics, including student and faculty member characteristics; contextual factors; and team characteristics (Haidet et al.).

Multiple learning outcomes occur as a result of the learner engagement, which occurs within the course content and within the teams. These include depth of knowledge, cognitive structures, problem-solving skills, team communication skills, and leadership skills. Haidet et al. (2008) assert, "Greater degrees of and higher-quality engagement both with content and other learners are expected to favorably affect a variety of learning outcomes…" (p. 125).

IMPLEMENTATION OF TEAM-BASED LEARNING IN THE CLASSROOM

Team-based learning can be implemented in any classroom. While many options exist for implementation, the purpose of this article is to review the basic components of team-based learning and provide enough information to implement this teaching strategy in the classroom. Team-based learning involves a three-phase process: pre-class preparation, Readiness Assurance Tests, and application of course concepts.

Phase 1: Pre-Class Preparation

During the pre-class preparation phase, faculty member responsibilities include selecting reading assignments, which may involve textbook readings or additional assignments. Additionally, formation of groups may occur during this phase.

Reading assignments. Reading assignments need to reflect the unit topic and may include text readings and other assignments. After completing the readings, students should have a thorough understanding of the concepts prior to coming to class (Michaelsen & Sweet, 2008).

Group formation. At the beginning of the semester, the faculty member will facilitate group formation. Groups usually consist of five to seven students and remain intact for the whole semester. While many different methods for creating groups exist, the recommended method is to form them in class with the students present. Students can line up around the room based on similar characteristics and then number off to become heterogeneous groups. However, the faculty member can also pre-assign groups in order to ensure an appropriate mix of skills and academic ability in each group in order to promote development of students (Michaelsen & Sweet, 2008).

Phase 2: Readiness Assurance Tests

Readiness Assurance Tests. The faculty member develops one Readiness Assurance Test for each unit of instruction. For example, one Readiness Assurance Test becomes both an Individual Readiness Assurance Test (IRAT) and a Group Readiness Assurance Test (GRAT) for each unit of instruction. The Readiness Assurance Test is a multiple-choice quiz based on the assigned unit readings and taken without the use of textbooks or notes. The number of questions may vary based on the amount of information in each unit and the length of class time. For example, for a three-hour class time, one faculty member developed a 25-question Readiness Assurance Test (personal communication, September 15, 2009). The Readiness Assurance Test should ensure student understanding by testing the key concepts from the readings. Furthermore, the Readiness Assurance Test prompts pre-class preparation, and therefore, assures individual and group accountability (Michaelsen & Sweet, 2008).

At the beginning of each unit of instruction, the IRAT is given to every student and graded by the faculty member. After this is completed, students form

their groups and take the GRAT, which consists of the same questions as the IRAT, only with the answers scrambled. The GRAT provides an opportunity for students to discuss the questions and answers, thus promoting learning and discussion among the groups. During this group activity, the Immediate Feedback-Assessment Technique (IF-AT) self-scoring sheet is used. The IF-AT form is similar to scratching off a lottery ticket and offers multiple choice options for each question. Once the groups determine their answer, they scratch off the appropriate box. If there is not a star present in their box, their choice was not the correct answer and they must continue scratching off boxes until the correct answer is found. Full or partial credit is awarded based on the number of boxes the group scratched before revealing the correct answer (Michaelsen & Sweet, 2008). The benefit of using the IF-AT forms, according to Michaelsen and Sweet, is that the students have truly immediate feedback, can "quickly correct their misconceptions of the subject matter" (p. 24), and the IF-AT form "is the single most powerful tool one can use to promote learning and cohesiveness in classroom learning teams" (p. 24). The forms are available from www.epsteineducation.com.

Scoring of the IRATs and GRATs is at the faculty member's discretion. However, Michaelsen and Sweet (2008) recommend group scores be weighted heavier than individual scores to increase team cohesion and effort. The IRAT and GRAT scores are then recorded for each individual student.

Appeals process. Following the completion of the GRAT, students may appeal their missed questions by providing the rationale based on the assigned readings. Appeals can then be addressed by the faculty member to the entire class. If the rationale provided by the group is deemed sufficient, the faculty member may choose to award credit for the question. This allows for clarification of content that may be confusing to students (Michaelsen & Sweet, 2008).

Phase 3: Application of Course Concepts

The third phase of team-based learning is the application of course concepts. This phase consists of activities designed by the faculty member to enhance student understanding of course content and increase group cohesion. Furthermore, the application exercises allow students to focus on applying material rather than simply memorizing it. Students work together to solve challenging problems created by the faculty member. Although there are a variety of activities that could be developed, the faculty member should consider the following four main points when creating group application assignments:

1. the problem should be significant to the students;
2. groups should all work on the same problem;
3. groups should be asked to make a specific choice; and
4. groups should report their answers simultaneously (Michaelsen & Sweet, 2008).

By way of example, for a unit focused on health care and global health in a community health nursing course, a faculty member developed the following application exercise (personal communication, September 15, 2009). Two multiple-choice questions were posed to each group. The first question was: "To what extent does the nursing shortage affect global health?" Groups were asked to choose from the following responses: (a) to no extent, (b) to some extent, and (c) to a great extent. The second question was: "Who do you believe has the greatest impact on improving health care in the world?" Groups were to choose from the following responses: (a) national health organizations, (b) global health organizations, and (c) non-governmental organizations. Additionally, each group was asked to provide rationales for their responses.

In a medical-surgical course, an example application exercise might consist of a case study regarding a patient with congestive heart failure. The faculty member would provide students with the patient's medical history, medication list, current vital signs, and laboratory values. Each group would then answer the following questions:

1. identify the priority nursing diagnosis for this patient;
2. list four nursing interventions appropriate for this patient;
3. identify the purpose of each of the patient's medications; and
4. identify the abnormal lab values, the normal ranges of these lab values, and interpret the patient's results.

The groups would also be required to provide rationales for their answers.

Upon completion of the application exercise, students must then present their answers to the class. If a multiple-choice answer must be reached, groups may simultaneously hold up a color-coded card to represent their choice. The group may also have to verbally provide their rationale to the class. If the group was required to develop a short-answer, they might record their response on a large sheet of paper. The faculty member then has one person from each group come to the front of the class to present their answers. After the answers have been displayed, the teams can then debate their responses as a class (Clark et al., 2008). Simultaneous reporting also allows teams to be "(a) accountable for its choice and (b) motivated to defend its position" (Michaelsen & Sweet, 2008, p. 49).

Coverage of Content

Throughout the team-based learning process, the faculty member serves as a facilitator and provides feedback and clarification of material as necessary (Michaelsen, 2002). Although the faculty member serves as a content expert, lecture is unnecessary because students come to class prepared and ready to apply the information (Pelley & McMahon, 2008).

Sequence of Team-Based Learning

Each three-phase cycle of team-based learning is repeated for every unit of instruction, as shown in the Figure, and usually consists of 6-10 hours of class time (Michaelsen & Sweet, 2008).

Preparation	Readiness assurance	Application of course concepts
(pre-class)	45-75 minutes of class time	1-4 hours of class time
	Individual test Team test	Application oriented activities

Figure. Team-based learning instructional activity sequence (repeated for each major unit = 5-7 per course).

Note. From "Fundamental Principles and Practices of Team-Based Learning", by L. Michaelsen, & M. Sweet, 2008, *Team-based learning for health professions education: A guide to using small groups for improving learning*, p. 21. Copyright © 2008 by Stylus Publishing, LLC. Reprinted with permission.

EFFECTS OF TEAM-BASED LEARNING ON FACULTY MEMBERS

Team-based learning allows small groups to interact without requiring multiple educators to be present, unlike other methods such as problem-based learning. Even with large classes of 200 students, team-based learning can be used effectively by one faculty member (Clark et al., 2008). This shift towards placing the responsibility of learning onto the student alleviates faculty burden and allows the faculty member to become a facilitator of learning (Touchet & Coon, 2005).

Faculty members who have used team-based learning are generally satisfied with this teaching strategy (Clark et al., 2008; Thompson, Schneider, Haidet, Perkowski et al., 2007). Students attend class more regularly and are better prepared for interacting with the material (Thompson, Schneider, Haidet, Perkowski et al.). This enhances faculty-student interactions, resulting in more fulfilling relationships (Michaelsen & Sweet, 2008).

Initially, faculty must invest time to implement team-based learning in their courses (Ortega et al., 2006). The development of IRATs, GRATs, and application exercises requires preparation. Additionally, faculty members are expected to be content experts and provide clarification of material as necessary (Team-Based Learning Collaborative, 2005). In a study by Thompson, Schneider, Haidet, Perkowski et al. (2007), faculty members acknowledged that team-based learning required a time commitment the first time. However, they also expressed that it was well-received by students and was an effective method of teaching. Although preparing a course to use team-based learning requires time and can seem impossible to faculty members who may already be overwhelmed with heavy workloads, team-based learning can be successfully implemented in an entire course or gradually by converting a module each semester. Once the IRATs, GRATs, and application exercises are completed, they can be reused each semester with minimal changes. Furthermore, Parmelee (2008) has stated, "…we feel that for professional students to be engaged fully, challenged intellectually, and have the opportunity to develop interpersonal and teamwork skills, the team-based learning strategy holds the greatest promise in curriculum development" (p. 6).

Student Advantages of Team-Based Learning

Preparation. Out-of-class preparation is critical to make best use of team-based learning and maximize individual learning (Clark et al., 2008; Dana, 2007; Ortega et al., 2006). Students are motivated to prepare and develop an understanding of the course content prior to coming to class (McInerney & Fink, 2003). This pre-class preparation results in enhanced and deeper discussion during class time (Thompson, Schneider, Haidet, Levine et al., 2007). Dunaway (2005) found that "students felt obligated to prepare before class to do their best in intragroup and intergroup discussion" (p. 60).

Accountability. The IRATs and GRATs ensure accountability (McInerney & Fink, 2003). Students reported they did more to actively prepare for their classes that used team-based learning than they did for classes that used

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primarily lecture format, and they cited the desire to do well on the Readiness Assurance Tests as their reason for preparing (Clark et al., 2008).

Teamwork. Teamwork and learning among students is purported to improve with team-based learning (Clark et al., 2008). Working in groups exposes students to multiple viewpoints and ideas, in which they gain additional insights from each other (Paswan & Gollakota, 2004). This creates a learning environment where students teach and learn together, thus maximizing group learning (Bastick, 1999; Dana, 2007). Students learn how to work as a team to solve problems (McInerney & Fink, 2003). Additionally, this collaboration and interaction teaches practical interpersonal skills that are helpful in the work environment, particularly in the health care setting (Rider et al., 2008).

Interpersonal communication skills. Small group learning promotes interpersonal communication skills and group skills (Clark et al., 2008; Paswan & Gollakota, 2004). In a study by Baldwin et al. (1997), the level of communication within a team was strongly associated with effectiveness of the team; teams with a high level of communication were more likely to achieve positive outcomes.

Critical thinking skills. Critical thinking skills and problem solving skills are improved when using team-based learning. Students who learn by using this type of method tend to assimilate the content better than others who are not using it, according to Clark et al. (2008) and Thompson, Schneider, Haidet, Levine et al. (2007). As well, group application activities in team-based learning encourage students to connect theory with practical applications, essentially "building a bridge between theory and practice" (Touchet & Coon, 2005, p. 295).

Student engagement. Student engagement is enhanced with team-based learning (Bastick, 1999; Clark et al., 2008; Thompson, Schneider, Haidet, Perkowski et al., 2007). Rather than allowing passive learning, students actively use the knowledge they have learned (Dunaway, 2005). Team-based learning also allows students to focus on applying and mastering concepts during class time (Michaelsen & Sweet, 2008; Ortega et al., 2006). Thus, the transition from being a passive learner to an active learner fosters student learning (Thackeray & Wheeler, 2006).

Comprehension and recall of material. Students' comprehension and retention of material is enhanced when using team-based learning (McInerney & Fink, 2003; Touchet & Coon, 2005). In a study of team-based learning by Touchet and Coon, faculty members teaching the course noticed that medical

residents were integrating the concepts into their casework more effectively than from previous classes.

Student satisfaction. Studies in other disciplines have demonstrated favorable student responses to team-based learning (Dunaway, 2005; Seidel & Richards, 2001; Touchet & Coon, 2005). Reported was that small group activities increased students' enthusiasm for the course (McInerney & Fink, 2003), and peer interaction increased overall student satisfaction with the course (Baldwin et al., 1997).

DISCUSSION

With the calls from the NLN, NCSBN, and AACN, there is a sense of urgency among nurse educators to determine the best possible methods to create a rich, engaging learning environment for students. As nurse educators review their teaching methods to determine how to best meet the learning needs of students while meeting educational standards, current teaching methods may fall short. Team-based learning is a relatively new teaching and learning method that has the potential to enhance nursing education.

Limitations and Recommendations

As with every teaching method, team-based learning has some limitations. As previously mentioned, team-based learning does require an initial time commitment from faculty members. Time is required to convert a course to implement team-based learning, including creating Readiness Assurance Tests and application exercises. Furthermore, faculty member buy-in is necessary for team-based learning to be successfully implemented. Faculty members must be willing and interested to try a new teaching method to replace their current methods. Team-based learning also requires more physical classroom space when compared to more traditional methods, such as lecture. Students need physical space to move around and interact with group members. However, it has been reported that some course content may not be appropriate for team-based learning (Thompson, Schneider, Haidet, Perkowski et al., 2007).

CONCLUSION

This paper has offered a delineated "recipe" for implementation of team-based learning in order to provide a more structured student-centered learning environment. Despite the initial time commitment from the faculty member, team-based learning can provide a more positive and engaging academic teaching

and learning environment. "Academic environments that best support student success create high expectations for student learning… Students express accountability for their own learning … students are actively engaged in learning and are encouraged to question and seek answers…" (AACNb, 2008, p. 12).

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