



Utilizing constructivism learning theory in collaborative testing as a creative strategy to promote essential nursing skills

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SUMMARY

In nursing education, students participate in individual learner testing. This process follows the instructionist learning theory of a system model. However, in the practice of nursing, success depends upon collaboration with numerous people in different capacities, critical thinking, clinical reasoning, and the ability to communicate with others. Research has shown that collaborative testing, a constructivism learning activity and a form of collaborative learning, enhances students' abilities to master these areas. Collaborative testing is a clear, creative strategy which constructivists would say supports the socio-linguistic base of their learning theory. The test becomes an active implementation of peer-mediated learning where individual knowledge is enhanced through problem solving or defense of an individual position with the collaborative method. There is criticism for the testing method's potential of grade inflation and for students to receive grade benefits with little effort. After a review of various collaborative testing methods, this nursing faculty implemented a collaborative testing format that addresses both the positive and negative aspects of the process.

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Introduction

The 2010 Institute of Medicine report on the future of nursing called for a transformation from content-based nursing education to a program that emphasizes concept application across client settings, inter and intra professional collaboration, and leadership development (Institute of Medicine, 2010). Completion of this goal requires nursing students to develop collaboration and communication skills. The traditional summative testing methods utilized in nursing programs do not promote these skills. Instead, individuality is promoted and collaboration is punished as a form of cheating when not specifically part of an assignment, for example testing. Furthermore, summative evaluation is designed to merely assess student knowledge, but does not enhance knowledge development, critical thinking, collaboration, or communication ability. To increase student success in the application of concepts in addition to the knowledge of concepts, faculty at a small, private Midwestern University developed and implemented collaborative testing in combination with traditional individual testing. The premise of this collaborative testing technique utilizes the theory of constructivism learning as an alternative to instructionist theory.

Collaborative testing was introduced into the traditional as well as accelerated (second degree) pre-licensure baccalaureate programs.

Faculty interested in utilizing this method taught junior level pediatrics in the traditional program and introductory medical/surgical nursing in the accelerated program. Examinations in both of these programs account for 50 to 60% of the course grade and are administered in multiple-choice formats to prepare students for the type of question used in the National Council Licensure Examinations (NCLEX).

Background

Instructionists state that using a systems model provides learning through a very organized and systematic method. According to constructivists there is nothing systematic about how we learn or construct knowledge. Rather, constructivists believe that knowledge is constructed socially using language (Vygotsky, 1962) and everyone has different social experiences resulting in multiple realities (Jonassen, 1997). Constructing knowledge, then, is a socio-linguistic process where there is gradual advancement of understandings built upon previous knowledge resulting in multiple dimensions of the truth (Spiro and Jehng, 1990; Spiro et al., 1991). Students add to their learning through a variety of different experiences constructing knowledge from social encounters using language.

The constructivist learning method is particularly suited for scientific knowledge. In this domain collaboration is paramount in initiating convergent conceptual change. Conversational interaction provides a means for students to construct increasingly sophisticated approximations to scientific concepts collaboratively, through gradual refinement of ambiguous, figurative, and partial meanings (Roschelle, 1992). Face-

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to-face interaction enables participants to construct, monitor, and repair shared knowledge (Sacks et al., 1974).

Collaborative testing, a constructivist learning method, is an assessment method where students work together to develop answers on course examinations. This method is contrary to traditional testing methods, an instructivist learning method, used in education where students are tested individually. Traditional examination methods are time consuming and train students to work toward getting answers correct rather than growing as a learner (Dweck, 1999). Additionally, individual exams create an environment where collaboration is viewed as cheating, students compete for rank, and anxiety is heightened (Dallmer, 2004; Lusk and Conklin, 2003). Furthermore, this method may not accurately measure student knowledge gained (Dallmer).

Collaborative learning is a student-focused, active learning strategy (Dallmer) as well as an interpersonal form of critical thinking that is essential in nursing (Alfaro-LeFevre, 2010). With collaboration, students participate in a democratic process of data analysis to promote critical thinking skills and collaboration skills (Lusk and Conklin, 2003). Furthermore, the social interaction and mentoring that occurs between peers in collaborative learning activities promotes knowledge acquisition and motivation to continue learning (Vygotsky, 1978). The collaboration between students promotes opportunities where students can work together to solve a problem. Thus, students assume the role of instructor to model expert behavior, provide “just-in-time” scaffolding, and promote reflection (Collins et al., 1989).

Research has shown that there are many benefits to utilizing collaborative testing as a constructivist learning method. Critical thinking ability (Kapitanoff, 2009; Lusk and Conklin, 2003; Shindler, 2004), student test taking skills (Lusk and Conklin, 2003), and collaboration skills (Lusk and Conklin, 2003; Dallmer, 2004; Kapitanoff, 2009; Shindler, 2004; Sandahl, 2010) are enhanced with student participation in collaborative testing. Furthermore, student learning is improved by interacting with others to solve a problem or defend an answer (Bloom, 2009; Kapitanoff, 2009; Sandahl, 2010; Shindler, 2004). Additionally, students express greater motivation for learning (Dallmer, 2004; Shindler, 2004) and express increased study efforts to prepare for exams since others are depending on their knowledge application (Lusk and Conklin, 2003; Sandahl, 2010). Student exam scores are higher when they take the exam collaboratively (Bloom, 2009; Lusk and Conklin, 2003; Haberyan and Barnett, 2010; Kapitanoff, 2009; Sandahl, 2010). Moreover, Bloom found that collaborative exam scores were higher than scores earned when students were allowed to take individual exams while using course texts and notes. Further benefits include decreased test anxiety (Lusk and Conklin, 2003; Kapitanoff, 2009; Sandahl, 2010) and higher course evaluations (Dallmer).

Counter to these benefits is a concern of grade inflation and the potential for social loafing students to receive grade benefits without effort. Data related to these negative effects is mixed in the literature. Shindler found that approximately 20% of students were marginal contributors on collaborative exams where students submit one answer sheet per group. Conversely, Kapitanoff found that students put in the same amount of study effort whether they were preparing for individual or collaborative exams. Also, individual final exam scores were the same or higher for students who participate in courses using collaborative unit exams compared to students who took individual unit exams (Lusk and Conklin, 2003; Haberyan and Barnett, 2010; Sandahl, 2010).

While collaboration is a component of nursing curricula, students are rarely challenged to develop these skills with individual examinations and limited ability to actively participate in delegation, care conferences, or interdisciplinary communication prior to the senior year. Faculty at a small, private Midwestern university reviewed various collaborative testing methods and learning theories. The result was a collaborative testing model that utilized the basis of constructive learning principles. Furthermore, the faculty implemented strategies to decrease grade inflation and the potential for decreased student effort while promoting active learning.

The Model

The model used was introduced into junior level traditional pediatric and introductory level accelerated (second degree) medical/surgical nursing courses. The classes in pediatrics had 16–20 students per section and the accelerated classes had approximately 30 per section. The model was used with each test scheduled throughout the course, including the final exam. The examinations were in a multiple-choice format similar to the structure of the licensure exam that students take after graduation. Throughout the course, students were given 3–6 examinations consisting of approximately 50 questions applicable to the current course subject matter and a 100 question cumulative final examination.

In the model that was developed, students took the examination individually to decrease the potential for social loafing and then they repeated the exam in randomly assigned groups of three to six students depending on class size. Students were given 1 h to complete each of the examinations during the term and 2 h to complete the individual final examination. The retesting occurred immediately after the individual examination so that information was current in the minds of the students. With this method, students could receive immediate feedback and review of the information included in the examination. Additionally, the time for retesting was limited to half the amount of time allowed for the original exam; 30 min for a term exams and one hour for a final exam. Students in the collaborative groups were given one answer sheet per group to complete in order to enhance communication and collaboration skills. Furthermore, students were permitted to use their course learning materials when taking the exam. The decision to allow the use of course materials was based on the results of student course evaluations which revealed that students reported difficulty with locating and using course resources for problem solving.

The score earned by the group on the collaborative exam may entitle the individual student to a small amount of extra credit added to their individual exam score. The faculty believes that this approach enhances student motivation to participate in the collaborative exam to earn a higher score. In order to decrease the likelihood of grade inflation, students must participate in the collaborative exam and earn a passing score on their individual exam to be eligible for extra credit. The extra credit is awarded based on the score earned on the collaborative exam by the group. Students earn an additional 2% in extra credit for earning an A or an A– on the collaborative exam and 1% for earning a B or B+ on the collaborative exam. If the group score is a B– or lower, the students in the group do not earn extra credit. With the initiation of this model, students in the accelerated program were not permitted to use course notes or textbooks for the collaborative exam. In this instance, the course faculty used a different scale for extra credit: 3% for an A, 2% for a B and 1% for a C.

To successfully complete the course, students in both the traditional and accelerated pre-licensure programs must succeed in both the didactic and clinical sections of the course, which are weighted and combined for the final grade. Course examinations account for 50 to 60% of the final course grade. The collaborative testing is designed to decrease the problem with grade inflation by only granting extra credit to those students who have succeeded on an exam by their individual effort. This policy prevents borderline students from completing courses based on the efforts of their classmates and encourages students to work on developing their individual knowledge base. The distribution of extra credit points allows all students who succeed with the exam credit without inflating the grades unnecessarily.

Effectiveness

After approximately two years of utilizing collaborative examination the faculty feels that their efforts have successfully enhanced their pre-licensure programs' examination effectiveness. As previously discussed, collaborative learning has the potential to improve student

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