Bridging the Theory-Practice Gap: Situated Learning as a Pedagogical Framework for Teaching Undergraduate Nursing Students

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ABSTRACT: A theory-practice gap has been described in the literature where essential nursing skills and knowledge covered in the classroom do not transfer well to the clinical setting. In order to minimize this gap, a situated learning framework was implemented to teach essential skills and knowledge to 2nd year medical/surgical nursing students. This paper describes the innovative development and implementation of this approach in detail. A clinical simulation center was utilized to create an authentic learning environment and a collaborative community of practice was established through the use of situated learning strategies. These included case scenarios, reflective practice and debriefing, cognitive apprenticeship, collaboration, coaching, multiple practices, articulation of learning skills, and the use of technology. The situated learning approach enabled simultaneous delivery of multiple teaching and learning points. Students' feedback suggests that this hands-on, interactive approach is engaging for students and teachers, has potential to reduce the theory-practice gap and is a viable and valuable theoretical approach to nursing instruction.

Keywords: Situated Learning, Pedagogy, Theory-Practice Gap, Nursing Education, Simulation

RESUMÉ: En littérature, on a décrit le décalage entre la théorie et la pratique comme étant un ensemble de connaissances et de capacités infirmières fondamentales apprises en classe mais que l'on ne peut réellement pas adapter au milieu hospitalier. Afin de réduire ce décalage, on a mis en place un cadre d'apprentissage contextualisé pour enseigner les connaissances et capacités élémentaires infirmières aux étudiants de deuxième année des services médical et/ou chirurgical. Dans cet article, on décrit en détails l'élaboration et la mise en application de cette méthode innovatrice. Un véritable milieu d'apprentissage a été créé dans un centre de simulation hospitalier et une communauté de pratique participative a été mise en place grâce au recours de stratégies de formation contextualisée. Les stratégies comprenaient des scénarii, une pratique pédagogique ainsi que des réunions bilan, un apprentissage cognitif, une coopération, un encadrement, des pratiques diverses, une articulation de capacités d'apprentissage et le recours à la technologie.

La méthode d'apprentissage contextualisé a permis de présenter divers aspects pédagogiques et de formation en même temps. La réaction des étudiants laisse à penser que cette méthode de terrain interactive leur est motivante ainsi que pour les enseignants, qu'elle pourrait réduire le décalage entre la théorie et la pratique, et que c'est un procédé théorique réalisable et utile dans l'enseignement des soins infirmiers.

Mots-clés : apprentissage contextualisé, pédagogie, décalage entre la théorie et la pratique, enseignement des soins infirmiers, simulation.

Background

Skills and theory instruction for clinical nursing courses are often difficult to teach in context. Competency in mathematics, in particular, has been recognized as a vital skill for nursing practice and one that is also difficult to teach effectively. This is partially because students sometimes experience difficulty making the cognitive link between how textbook information and didactic presentations apply to nursing practice (Greenfield, Whelan, & Cohn, 2006; Sherriff, Wallis, & Burston, 2011; Wright, 2004). Even when students achieve competency in the classroom, these concepts and skills may not transfer to the hospital. This lack of transference is widely referred to in the nursing literature as the theory-practice gap. Since Nursing is a practice-based profession that is also dependent on theoretical knowledge, finding ways to reduce the theory-practice gap is a highly important endeavor for Nursing education.

Theoretical Framework and Literature Review

Scully (2011) defines theory-practice gap as the inability to "[match] textbook descriptions of clinical situations with the reality of practice" (p.93). This definition highlights the 'distance' that exists between theoretical knowledge and its practical application. One of the possible reasons for this 'distance' is a range of discrepancies between what is taught and observed in the classroom and what is experienced in the reality of the clinical setting (Dadgaran, Parvizy, & Peyrovi, 2012). One of the challenges inherent in the issue lays in the fact that theoretical knowledge and practical skills are both vitally important. Adequate theoretical preparation is critical for intelligent nursing practice, but will not suffice if new graduate nurses do not possess satisfactory hands-on skills (Perin, 2011; Wright, 2007; Yoo & Yoo, 2003).

The complexity of the factors that contribute to the theory-practice gap has stimulated much debate over the design and application of teaching strategies to address this gap (Perin, 2011; Wright, 2007; Yoo & Yoo, 2003). One of the barriers to successfully applying classroom knowledge to clinical practice is contextual difference between the two environments (Landers, 2000). The creation of an authentic context for learning is seen as essential for students

to develop strong connections between theoretical topics and the realities of practice (Cope, Cuthbertson, & Stoddart, 2000).

Past experience and observations by two authors of this paper (JH and ZH) teaching a medical-surgical nursing course prompted a search for a different method of delivering preclinical skills and theory lab classes. Poor comprehension and retention of information, combined with having to re-teach much of the material covered in lab classes once students entered the hospital, led the authors to believe that traditional methods were ineffective. The purpose of this paper is to describe the innovative development and application of a situated learning framework for teaching core skills and knowledge to 2nd year medical/surgical nursing students.

Vygostsky (1978) laid the foundations for situated learning theory when he proposed that learning occurs through collaboration and shared activities with more capable peers in the zone of proximal development. The shared activity creates a context where learning takes place, and the learner is viewed as a "cognitive apprentice" who observes and emulates through practice in shared activities (Brown, Collins, & Duguid, 1989; Collins, Brown, & Newman, 1987). Lave and Wenger (1991) view the situated learning environment as a "community of practice" where novices work alongside experts on shared activities and gradually develop increasing mastery of knowledge and tasks. There is minimal direct instruction; learning occurs through practice and instructor demonstration and feedback within the authentic context in which the skill will be used. Sayer (2014) examined the enactment of situated learning theory in clinical teaching and found that instructors were able to use some components of the theory with good effect. Sayer also extended understanding of how communities of practice "(re)produce" (p.433). The author concluded that mentorship provided under a community of practice model can be helpful in developing novice practitioners. Situated learning has also been adapted as a potentially useful framework for understanding and guiding nursing education in the classroom (Gieselman, Stark, & Farrugia, 2000). The authors identified eight strategies (discussed in detail later) that can be incorporated into classroom teaching. Paige and Daley (2009) have extended the application of situated learning theory to clinical simulation. The authors have adapted the concept of situated cognition to provide a learning framework for guiding and designing simulation activities. Paige and Daley (2009) explain that, the context where learning takes place is central to understanding cognition. Comprehension evolves within the learning environment from interactions between the: (a) activity; (b) people; and (c) prior knowledge that are brought to the situation (Jean Lave, 1988). Figure 1 illustrates the ecology of the situated learning environment.

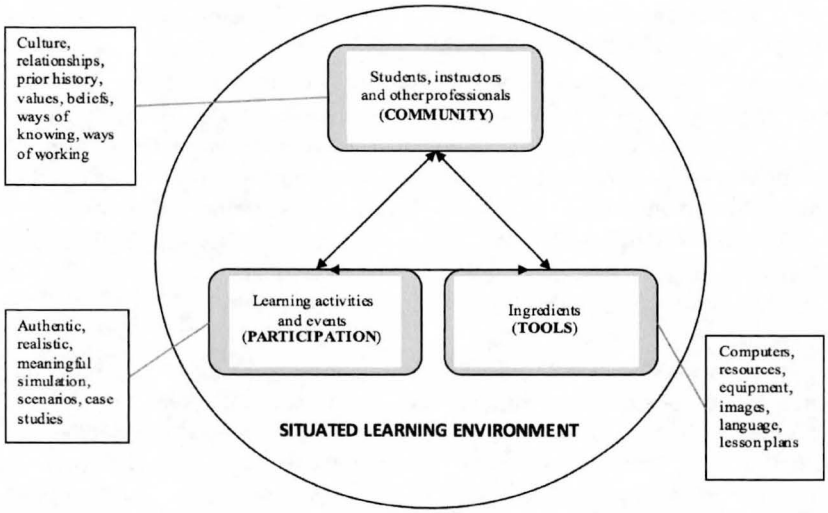

Figure 1: Ecological Analysis of the Situated Learning Environment (Adapted from Wyrostok, Hoffart, Kelly, & Ryba, 2014).

McLellen (1996) summarized eight situated learning strategies that can be applied to instructional settings: "stories" play an important role in the social construction of knowledge and provide a way for information to be understood, stored, and accessed at a later time; "reflection" enhances the integration of new knowledge and buffers the shortcomings of purely experiential learning; "cognitive apprenticeship" exposes learners to authentic practices using activity and social interaction; "collaboration" can be used to promote shared problem solving and role model best practices; "coaching" occurs when instructors observe students carrying out a task and provide information, feedback and direction when necessary; "multiple practice" allows learners to become increasingly competent and confident performing skills within a collaborative and reflective context; "articulation of skills" allows learners to make their knowledge, reasoning and problem solving explicit to gain a better understanding of these processes; and "technology" can be used to enhance other situated learning strategies (McLellen, 1996). A collaborative community of practice was developed through the utilization of these situated learning strategies in an authentic context.

Methods

Methodology

A mixed methods case study approach was used to assess the development and implementation of this project. A situated learning framework was developed based on our review of the literature. Delivery of a medical/surgical nursing course was adapted based on this framework. The environment was manipulated to approximate as closely as possible the actual hospital

environment. Detailed lesson plans were created that linked situated learning strategies to classroom activities. Survey data, a focus group, and instructors' reflections were used to assess the process. We hypothesized that the creation of a community of practice in an authentic environment utilizing the situated learning strategies as described by McLellen (1996) would minimize the theory practice gap and facilitate retention of knowledge.

Pedagogical Difference

Table 1 highlights the key differences between the situated learning approach and the usual approach to teaching this class. Previously this course was taught utilizing traditional methods.

Table 1. Pedagogical differences between situated learning approach and traditional approach

Situated learning approach	**Traditional approach**
Practice first, theory during and after	Theory first, practice later
Student learns through action	Student receives information and is expected to transfer knowledge to action
Learning in context	Learning out of context
Practical math exam	Paper/pencil exam

Development of a Situated Learning Framework

Lesson plan. A lesson plan was developed with the aim of creating a more interactive experience for students. It progressed from knowledge and skills learned in previous clinical courses to include new knowledge and skills required for this course. The new skills to be taught for this course included: monitoring and regulating IV lines and nasogastric (NG) tubes, administering IV and NG medications, administering NG tube feedings, and performing suctioning and blood transfusions. The eight situated learning strategies described earlier were purposefully incorporated into the lesson plan wherever possible. A sample of the lesson plan is presented in Table 2. The full lesson plan can be provided upon request to the author.

Table 2. Adult Health Practice lesson plan: day 1 of 6 (morning only)

Objectives	Perform routine AM care and assessments in a situated learning environment Prepare PO, IM and SC medications Reconstitute medication Practice math associated with PO/SC medication administration Demonstrate responsibility for assigned patient Practice receiving/giving endorsement			
Time	**Student activities**	**Instructor activities**	**Resources**	**Situated learning elements**
0800-1130	Required: Each student dyad receives handover report and assumes care for one SP: change bed sheets, take vital signs, encourage personal hygiene, prepare PO/SC meds, perform head to toe assessment, complete required documentation. Give handover report after completing work. Optional: Perform additional assessments of Foley/urine Optional: PRN Paracetemol admin	› Give handover report › Use guiding questions to help students perform required tasks. › Encourage self-directed learning › Demonstrate and instruct only when necessary › Encourage articulation of learning skills › Receive handover report	› 5 SPs › Patient scenarios › Foley › Text book (Fundamentals and Math)	› Stories (pt scenario) › Cognitive apprenticeship (instructor) › Collaboration (with instructor, in dyad, between dyads) › Coaching › Multiple practice › Articulation of learning skills › Technology (tools – syringes, medication vials, etc)

Authentic environment. All classes were held in a 5-bed simulated hospital ward located in UCQ's simulation center. The 'sim-ward' is set up like a basic shared hospital room with privacy curtains, adjustable beds, and common attachments, such as those for providing oxygen and suctioning, available near the bedside (see Figure 2). In addition to the basic set up, the sim-ward has a medication trolley containing sham stock medications, an equipment trolley containing general use items such as tape measures, penlights, reflex hammers, et cetera, and a supplies trolley containing towels, gowns and linen.

Figure 2. UCQ Simulation Center 'hospital ward'

Several innovations were introduced to increase the authenticity of the simulation ward: First, we created several different scenarios based on actual cases from the hospital units where students would be undertaking the majority of their clinical hours. Each scenario had a brief description of a patient's reason for admission and medical history, a 'night report' summarizing how the patient had fared overnight, a 'tasks' section indicating what would be expected of a nurse caring for such a patient, a 'doctor's orders' section, and a 'medication' section.

Second, we employed simulated patients to play the role of each patient described in the scenarios. The term simulated patient is used over the more traditional term, standardized patient, as scenarios (and student experiences) were not standardized but created to simulate the actual diverse environment of a hospital ward. Simulated patients were briefed on the scenarios and discussions were held with the instructors to identify common behaviours and concerns of acute care patients. Simulated patients were asked to come to the simulation ward 30 minutes prior to the first class of the semester and were prepared according to the conditions set out in the scenarios. For example, one simulated patient was given three temporary wound tattoos on her abdomen, covered with dressings, to simulate a post-laparoscopic cholycystectomy scenario. The same patient had a Foley catheter taped to the inside of her leg and connected to a urine bag, which was filled with clear, yellow liquid. Other simulated patients were set up with an IV port taped to the hand, which was connected to a bag of normal saline running at 100ml/hr (there was a towel underneath the patient's arm to collect the IV fluid, which dripped from the uninserted IV catheter).

Third, we made sure all of the necessary supplies to provide the care set out in the scenarios were available. The medication cart was stocked with the ordered medications, syringes were available for SC and IM injections, pill crushers and pill cutters were available, and a shelving unit was set up with IV fluid and tubing, emesis basins, wound care supplies, nasogastric tubes, suctioning equipment, et cetera. Previously, these items were made available in kits for the students to manipulate, but once students got to the hospital they became anxious when given the task of independently identifying and selecting the equipment from the supply room. This time, to increase authenticity we had all of the necessary supplies together in bulk on the shelving unit. Students were responsible for identifying and collecting specific items when needed.

Fourth, we created hospital charts for each simulated patient. Charts were filled with photocopies of the actual blank forms used at the clinical site and included nursing progress notes, graphic forms for vital signs, intake/output forms, doctors' orders, consent forms for surgery and anesthesia (if applicable to scenario), other assessment forms, and medication administration records. All relevant forms were filled with hypothetical data commencing on the date of admission as set out in the scenarios. The first three classes were designed to create a community of practice in an authentic context and will be described in detail. Table 3 contains a brief summary of these classes.

Table 3. Outline of the three situated learning lab-based classes

Class #	Morning session	Afternoon session
1	Simulated patients: › Routine care › PO/IM/SC medication administration › head-to-toe assessment	› Debrief › eDose©
2	Simulated patients: › IV infusion and medications › NG feeding and medications	› Debrief › Introduction to class › IV/NG math & theory
3	Vital SIM mannequins: › Safety precautions › Blood transfusion › NG tube insertion › Suctioning	› Debrief › Review of relevant math & theory from morning session

The remaining three classes were designed to supplement material covered in the situated classes, using more traditional didactic and workshop approaches (Table 4). These included: a wound care workshop, critical thinking exercises, and navigating thorough reliable sources of information to complete a patient profile and a nursing care plan. These classes will not be described in detail.

Table 4.Outline of the final three lab-based classes

Class #	Morning session	Afternoon session
4	› Math Review › Theory Review	› Math Exam › Lab Exam › eDose©
5	› Wound care workshop	› Expectations › Review learning gaps as needed › Head to toe assessment
6	› Patient research workshop	› Critical thinking › Care plans

Implementation of a Situated Learning Approach

Course delivery. Students were contacted prior to the start of classes for the semester and informed that they would be responsible for providing nursing care to simulated patients on the first day of class, and to come prepared. Students were provided with a study guide, outlining what tasks they would be responsible for during each class, what the objectives were for the class and what readings/resources they should review to prepare. When students arrived at 0800 on the first morning, they were led to a conference room and given a brief overview of situated learning and why it had been chosen to inform our instructional approach for this semester. One student asked, "So we are basically guinea pigs?" This thought was reframed and the students were told they had an important role to play in the creation and assessment of a new teaching approach and that their feedback and suggestions would be sought and acted on throughout the course. At 0830, students were given a patient assignment sheet on which student dyads had been assigned to a specific patient. Student dyads were then given their patient scenario and a brief handover report from the instructors and told to take over care for their patient. Activities set out in the scenarios for the first class were created as a review of prior learning; students were not responsible for performing any new skills or applying any new knowledge. Activities included taking vital signs, providing morning care, performing head to toe assessment, and administering oral, subcutaneous and intramuscular medications requiring dosage calculations. Throughout the morning, instructors guided and supported students' nursing care. At 1130, the simulation was ended for the day. After lunch students were debriefed and asked to reflect on their experiences from the morning and completed an online learning module for math (eDose©).

When students arrived on the morning of the second day, they were assigned to the same simulated patient. However, the scenarios for all simulated patients had evolved: in general, all patients' conditions had worsened overnight and new interventions and medications had been ordered. The scenarios were adjusted in a way that incorporated new skills/knowledge into the required nursing care for the day. For example, all patients had IV fluids, IV medications, and either a NG tube to gravity or NG feedings. Students were expected to perform necessary skills and apply relevant knowledge even though this information had not been covered in any previous class. It also required them to utilize math skills in regulating IV rates and administering IV and NG medications. Once again, instructors rotated between student dyads and used situated learning strategies to offer advice, encourage reflection and demonstrate techniques when necessary. At any given time during the clinical practice in the simulation lab, there were three instructors available for five groups of students. The instructors were regularly rotating between and guiding students at every step and were actively involved in patient care. The instructors played the role of experts (e.g., staff nurses, preceptors) providing coaching, mentoring, opportunities for multiple practices, fostering critical thinking by asking

questions, assisting with articulation of skills and encouraging reflection. Although the students were practicing new skills for the first time, they had frequent access to expert advice and demonstration (see Figure 3); which encouraged them to be more engaged and participatory without the fear of making mistakes which cannot be rectified. Students were encouraged to refer to their textbooks and web resources during the simulation to fill gaps in knowledge. Instructors were able to cover much of the theory, rationale, complications, and considerations at the bedside while working collaboratively with the students.

Figure 3. The expert (instructor) guiding the novices (students)

On the third morning, simulated patients were replaced with Vitalsim™ manikins due to the intrusiveness of skills to be covered. Manikins retained the identities of their human predecessors: scenarios once again evolved to incorporate new skills/knowledge to be learned; students were instructed to treat the manikins (as much as possible) as they treated their simulated patients in the previous two classes; and, wigs and pictures of the simulated patients' faces were attached to manikins for added effect. Manikins had a combination of IV lines, Foley catheters, nasal prongs, NG tubes, and dressings in place. Each student dyad rotated through three patients during the morning: one patient had pulled their NG tube out overnight and needed it reinserted; one had developed aspiration pneumonia and required nasotracheal and oropharyngeal suctioning; and, the other had developed low hemoglobin levels and required a transfusion of packed red blood cells. Students had to demonstrate proper safety precautions, refer to doctor's orders and provide care based on individual patient scenarios. It also involved adjusting flow rate for blood transfusion and documentation in the simulated patient's files and medication profiles. As in previous classes, students used their textbooks and online resources to gather information, and instructors employed situated learning techniques to facilitate student learning.

To further enhance math concepts, math review was performed in the afternoon of the third class utilizing examples from the morning scenarios. A take home sample math exam was given to the students, which was reviewed the next day. A paper and pencil math exam was administered, which was made more realistic by including case scenarios with doctor's orders, utilizing medication labels for commonly used medications. A practical math exam was also included requiring students to reconstitute a demo medication, prime the IV line and set the drip rate based on the exam question.

Study Procedures

This project occurred within the normal course delivery and was consistent with standard practices. Course delivery was adapted, and data was collected and analyzed but expectations for students meeting course objectives remained the same. Ethical approval for this project was obtained from the institution's Conjoint Health Research Ethics Board.

Recruitment. All students in the Adult Health Practice course were invited to participate. Recruitment was done by a co-investigator (KR) not involved with instruction or grading for potential participants. Participation was voluntary and informed consent was obtained from 9 out of 11 students. The other two students participated in the class activities but did not contribute to data collection.

Data collection. Data were collected at midterm (20 min questionnaire) and during the last week of classes (focus group). The questionnaire was developed by the researchers to explore students' perceptions on the utility of the situated learning approach, effective strategies for math instructions and students' reflection on their learning. Questions were scored from 0 (completely disagree) to 10 (completely agree). Several open-ended questions were also included.Content validity was determined through review by the University's acting Director of Teaching and Learning. Quantitative data was analyzed using Microsoft Excel data analysis formulas. A focus group was conducted to explore questionnaire responses in more detail and to help validate results. Thematic analysis was done and responses were summarized to infer the conclusions. Several areas were explored, including perceptions about the learning environment, the situated learning approach, math instructions strategies and application to practice. All data collection was conducted by the co-investigator (KR) not involved with teaching this course. Results of the regular course assessment (e.g., lab exam, math exam) as well as Instructors' reflections on the group's progress were also considered as data.

Results

Students' general perceptions of the situated learning approach are presented in Table 5.

Table 5. General perceptions of situated learning

General Perceptions	Mean(SD)
Felt like I was Nursing in a real hospital environment	7.1 (1.4)
The situated learning approach made learning easier	8.7 (1.2)
The situated learning approach was an engaging way to learn	8.4 (1.0)
Participation in the labs prepared me to apply **skills** in the hospital	8.6 (1.3)
Participation in the labs prepared me to apply **knowledge** in the hospital	8.3 (0.9)
The situated learning approach made it easier to adapt to the hospital setting	7.9 (1.4)

Students found a variety of math instructional methods to be helpful. The paper & pencil math review with instructors and the independent sample math exam were seen by the majority as being a helpful method of math instruction (n=8 and n=7, respectively). Students found other methods of instruction helpful as well, including, a computerized learning tool - eDose (n=5), 'bedside' teaching (n=4) and studying the textbook (n=3). Peer teaching was not included in the questionnaire, but was later identified by the students as another effective method for learning math skills.

During the focus group, students commented that the situated learning approach offered several advantages over traditional methods. Students were given a chance for "real practice" in an environment that was "like the hospital environment" but less threatening. Practicing new skills and knowledge was facilitated by increased presence of clinical instructors, openness of standardized patients towards students' inexperience, and ease of communication with the English-speaking standardized patients. Students requested that the situated learning approach be integrated into the curriculum at an earlier stage.

Areas for improvement were also identified. Students would have preferred to be given information about their patient prior to the lab classes, which is more in line with how they prepare for actual clinical days. Simulated patient cases were seen as being too basic. In particular, "crisis situations" or "unexpected events" were suggested as one way to increase realism. Students requested a longer debriefing to facilitate reflection on the positive and negative aspects of their nursing practice. Finally, several challenges of working in a new clinical setting were not addressed, including working with patients through a language barrier, obtaining lab results from unit computers, and dealing with sometimes negative attitudes from staff Nurses.

Overall, students felt this approach to learning was a positive and beneficial instructional method. Students preferred the experience of performing new skills before receiving related theory instruction. They felt it was "a good idea to do the procedure first" because otherwise "you don't get the real feeling of doing it." They felt it "made us more confident before going into clinical – even if we weren't 100% ok." They saw the lab classes as a collaborative experience where they were "treated more like an adult, [which] helped students to become independent." There was a consensus that "every clinical course should start the same way with hands-on learning."

Students performed well with regard to summative evaluation. All students passed the multiple choice theory exam (i.e., obtained above 64%) and 82% passed the short answer math exam (i.e., obtained above 90%). The remaining students passed the math exam after remediation. Instructors perceived a reduction in the theory-practice gap; knowledge and skills seemed to transfer to the clinical setting better than with traditionally taught cohorts and less re-teaching was needed.

Because this approach to teaching these classes represented a pedagogical change for students' learning, it is crucial to understand how students perceived the value of this situated learning approach. From the qualitative data, the researchers identified a theme in relation to students' perceptions regarding this pedagogical change:

> *"It was really helpful as I could really focus better on my areas of weakness in the theory class".*
> *"It was different from my previous experience in the sense that the simulation lab looked nearly like the hospital environment and I didn't find the hospital environment strange".*
> *"It prepares me well for my clinical practice by instilling confidence in me through the simulation experience".*
> *"It gave me an insight to how things would be in the hospital setting".*
> *"In this experience they better equip us with knowledge so that we would work [more] efficiently in the clinical".*
> *"It is a safe environment to apply what I think as a student have learned from labs, lectures, and readings in a real-life situation in a hospital setting".*
> *"I feel more comfortable in moving around the wards and communicating with the health care providers".*
> *"I gained more confidence/independence in my clinical rotations".*

These comments indicate the value students placed from this change in pedagogical approach. Because their learning was focused on integrating authentic experiences, students highlighted: their increased confidence and transference of learning to the real world environment.

Lessons Learned

This article has described the development and implementation of a situated learning framework for teaching pre-clinical classes in an undergraduate medical/surgical nursing course. Results suggest that the situated learning framework was an engaging, hands-on approach to teaching and learning. The combination of the 'ward' environment with standardized patients, realistic scenarios, props/medical equipment, and placebo medications seemed to be effective at modeling the hospital environment. Within this authentic learning environment it was relatively easy for instructors to implement the situated learning instructional techniques described earlier and to contextualize learning. Based on our students' conclusions, we feel that the teaching and learning process was enhanced by using a situated learning approach. The opportunity to practice in a non-threatening environment helped students to feel more prepared and more confident for the hospital portion of their course.

Through participation in this learning activity utilizing aspects of situated learning approach and creating a community of practice, students can gain insight and "feed forward" to see what they will be doing in the future when they have mastered certain skills and behaviors (Ryba, Selby, & Brown, 2004). The clinical placements where the students will eventually practice are complex social contexts (Cope et al., 2000). By creating the authentic environment, the learners are enabled to be successful in joining and being accepted by the community of practice in the hospital(Cope et al., 2000). The community approach to learning serves as a "collective zone of proximal development" where there is potential for the entire group of students to make greater advances in learning than would be the case if they were working independently (Ryba, Selby, & Kruger, 2002). Furthermore, the simulated context provides a safe environment to practice new skills through observational learning and social experience and has the potential to facilitate development of self-efficacy (Bandura, 1989; Goldenberg, Andrusyszyn, & Iwasiw, 2005; Pike & O'Donnell, 2010).The combination of in-class preparation, simulation, debriefing and follow-up discussion provides a basis for students to engage in "reflection-before-action, reflection-in-action, and reflection-on-action" (Onda, 2012). This reflective process has the potential to enhance comprehension and retention of a wide range of key nursing concepts and skills and decrease the theory-practice gap.

Limitations

Results from this mixed methods case study were favorable and provided evidence that situated learning approach was effective as compared to the traditional methods. However, comparison of performance against a control group would allow us to test and confirm some of the perceived successes of this approach. Additionally, the material and human resources requirement was high for implementation of this approach, which may be difficult for institutions with

restricted budgets. However, a situated learning simulation may still be feasible by identifying specific learning tasks (e.g. medication administration) and including only the resources necessary to accomplish these tasks.

Conclusion

Development of a situated learning framework for teaching medical/surgical nursing students was undertaken in response to a gap in the comprehension and retention of math and other nursing skills. Based on students' feedback on the approach and reflections on learning we recommend situated learning as a viable and potentially valuable theoretical approach to nursing instruction. Future testing using larger sample sizes and a control group would offer additional insight into the efficacy of the approach.

References

Bandura, A. (1989). Human agency in social cognitive theory. *American Psychologist*, *44*(9), 1175–1184.

Brown, J. S., Collins, A., & Duguid, P. (1989). Situated cognition and the culture of learning. *Educational Researcher*, *18*(1), 32–42.

Collins, A., Brown, J. S., & Newman, S. E. (1987). *Cognitive apprenticeship: Teaching the craft of reading, writing, and mathematics*. Champaign, Illinois: University of Illinois at Urbana-Champaign. Retrieved from http://ocw.metu.edu.tr/pluginfile.php/9107/mod_resource/content/1/Collins%20report.pdf

Cope, P., Cuthbertson, P., & Stoddart, B. (2000). Situated learning in the practical placement. *Journal of Advanced Nursing*, *31*(4), 850–856.

Dadgaran, I., Parvizy, S., & Peyrovi, H. (2012). A Global Issue in Nursing Students' Clinical Learning: The Theory–Practice Gap. *Procedia - Social and Behavioral Sciences*, *47*, 1713–1718. doi:10.1016/j.sbspro.2012.06.888

Gieselman, J., Stark, N., & Farrugia, M. (2000). Implications of the situated learning model for teaching and learning nursing research. *The Journal of Continuing Education in Nursing*, *31*(6), 263–268.

Goldenberg, D., Andrusyszyn, M., & Iwasiw, C. (2005). The effect of classroom simulation on nursing students' self-efficacy related to health teaching. *The Journal of Nursing Education*, *44*(7), 310–314.

Greenfield, S., Whelan, B., & Cohn, E. (2006). Use of dimensional analysis to reduce medication errors. *Journal of Nursing Education*, *45*(2), 91–94.

Landers, M. G. (2000). The theory–practice gap in nursing: the role of the nurse teacher. *Journal of Advanced Nursing*, *32*(6), 1550–1556. doi:10.1046/j.1365-2648.2000.01605.x

Lave, J. (1988). *Cognition in Practice: Mind, Mathematics and Culture in Everyday Life*. Cambridge ; New York: Cambridge University Press.

Lave, J., & Wenger, E. (1991). *Situated learning: Legitimate peripheral participation*. Cambridge, UK: Cambidge University Press.

McLellen, H. (1996). Situated learning: multiple perspectives. In H. McLellen (Ed.), *Situated learning perspectives* (Vols. 1-Book, 1-Section, pp. 5–17). Engelwood Cliffs: Educational Technology Publications, Inc.

Onda, E. L. (2012). Situated cognition: its relationship to simulation in Nursing education. *Clinical Simulation in Nursing*, *8*(Journal Article), e273–e280.

Paige, J. B., & Daley, B. J. (2009). Situated Cognition: A Learning Framework to Support and Guide High-fidelity Simulation. *Clinical Simulation in Nursing*, *5*(3), e97–e103. doi:10.1016/j.ecns.2009.03.120

Perin, D. (2011). Facilitating student learning through contextualization: A review of evidence. *Community College Review*, (Journal, Electronic), April 14, 2013. doi:10.1177/0091552111416227

Pike, T., & O'Donnell, V. (2010). The impact of clinical simulation on learner self-efficacy in pre-registration nursing education. *Nurse Education Today*, *30*(5), 405–410. doi:10.1016/j.nedt.2009.09.013

Ryba, K., Selby, L., & Brown, R. (2004). Developing mental imagery using a digital camera: a study of adult vocational training. *Down Syndrome Research & Practice*, *9*(1), 1–11.

Ryba, K., Selby, L., & Kruger, L. J. (2002). Creating computer-mediated communities of practice in special education. *Special Services in School*, *17*(1-2), 59–76.

Sayer, L. (2014). Communities of practice, a phenomenon to explain student development in community nursing. *Primary Health Care Research & Development*, *15*(4), 430–440. doi:10.1017/S1463423613000455

Scully, N. J. (2011). The theory-practice gap and skill acquisition: An issue for nursing education. *Collegian*, *18*(2), 93–98. doi:10.1016/j.colegn.2010.04.002

Sherriff, K., Wallis, M., & Burston, S. (2011). Medication calculation competencies for Registered Nurses: a literature review. *Australian Journal of Advanced Nursing*, *28*(4), 75–83.

Vygotsky, L. S. (1978). *Mind in society*. Cambridge, MA: Harvard University Press.

Wright, K. (2004). An investigation to find strategies to improve student nurses' math skills. *British Journal of Nursing*, *13*(21), 1280–1284.

Wright, K. (2007). A written assessment is an invalid test of numeracy skills. *British Journal of Nursing*, *16*(13), 828–831.

Wyrostok, L. J., Hoffart, J., Kelly, I., & Ryba, K. (2014). Situated Cognition as a Learning Framework for International End-of-Life Simulation. *Clinical Simulation In Nursing*, *10*(4), e217–e222. doi:10.1016/j.ecns.2013.11.005

Yoo, M. S., & Yoo, I. Y. (2003). The effectiveness of standardized patients as a teaching method for Nursing fundamentals. *Journal of Nursing Education*, *42*(10), 444–448.

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