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A Process for Teaching Research Methods in a Virtual Environment

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ABSTRACT

Translating and integrating scholarship into practice is a difficult concept for students to embrace through a passive education model. Therefore, innovative teaching strategies were integrated into a translational science course for online graduate nursing students. The purpose of this project was to increase understanding of the research process and stimulate interest in translating nursing evidence into practice. The result was an effective educational strategy for teaching and learning about the research process in a virtual environment.

The Essentials of Master's Education in Nursing (American Association of Colleges of Nurses, 2011) created high standards for graduate nursing students. Graduates should be prepared to lead changes that improve quality outcomes, advance a culture of excellence, lead collaborative inter-professional care teams, and translate evidence into practice. Translating evidence into practice is specifically addressed in *Essential IV* which states that students can "apply research outcomes within the practice setting, resolve practice problems, work as a change agent, and disseminate results (AACN, 2011, pg. 4)". Translating and integrating research evidence into practice is a difficult concept for students to embrace through a passive education model comprised of video lectures and supportive readings without opportunities for application. It is with the above-mentioned mandate that an innovative approach to teaching a translational science course was developed for online graduate nursing students. The result was an effective and unique method for teaching and learning the research process in a virtual environment.

Traditionally, translating evidence into practice seems to be a stumbling block for many students and nurses (Liou, Cheng, Tsai, & Chang, 2013). Pravikoff, Tanner, and Pierce (2005) surveyed 3000 RNs and concluded that nurses "weren't prepared to use the information resources available to them, however adequate or inadequate. They received little or no education or training in information retrieval, didn't understand or value research, and were generally unprepared for a practice built on evidence" (pg. 49). Later, Melnyk, Fineout-Overholt, Gallagher-Ford, and Kaplan (2012) surveyed a random sample of 1015 RN members of the American Nurses Association. Their findings showed that nurses surveyed across the country are now ready for and do value evidence-based practices (EBP), yet barriers cited by nurses for over two decades still remain. Barriers include lack of time, knowledge, mentors, and organizational support. The results also indicated specific participants need to gain more EBP knowledge and skills. Therefore, nurse educators have a responsibility to address the inability or reluctance of nurses to translate evidence into practice through better educational techniques with students.

There is evidence that some strides are being made in undergraduate education. Positive experiences of undergraduate students with data collection improved understanding of the research process and increased their interest in research (Finetto, Carpanon, Turroni, Camellin, & Mecugni, 2013; Henoch et al., 2014; Liou et al., 2013). However, there appears to be a gap regarding graduate nursing students, especially when it comes to the online environment. The purpose of this project was to develop an online course that increased understanding of the research process and stimulated interest in translating nursing evidence into practice by integrating application of research principles parallel to course content.

Translational Science (TS) II is the second of the two required courses, of which TS I introduces students to theory, qualitative research, and the elements of research appraisal. The primary course objectives for TS II related to quantitative research designs and methods. The project application strategies integrated into the course included facilitating understanding of the research process through application, appreciating common data collection challenges, interpreting and summarizing descriptive research results, and providing an opportunity to disseminate research findings to colleagues. To accomplish these objectives, faculty developed a research proposal on attitudes toward men in nursing, approved by the IRB. Therefore, the TS II students actively participated in a research project related to attitudes toward men in nursing.

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Theoretical framework

The Adult Learning Model (Caputi, 2010) underpinned this educational strategy. The model indicates that adults: 1) seek applications to the real world and must recognize a direct relationship with what is being learned; 2) desire to be actively involved in the learning process; 3) offer life experiences to learning new concepts; 4) require independence in their learning process; and 5) prefer to learn at their own pace.

Educational strategies

Strategies for application of research principles were chunked into individual assignments and went along with the course content that supported the aforementioned objectives. Specifically, the course content and project activities were presented in four modules to promote student understanding of the research process and stimulate their interest in translating nursing evidence into practice. Table 1. Provides a description of the course content with integration of specific project strategies.

Description of project strategies module 1

In the introductory module at the beginning of the semester, students completed the National Institutes of Health online certification for "Protecting Human Research Participants" and critiqued a qualitative journal article on nurses' perception of attitudes and stereotypes in the profession. This assignment was used as a transitional device to review the previous course (i.e., TS I), which focused on nursing theory and the qualitative approach, and provide the background for the educational activities integrated into the course content. As part of the course introduction, students viewed the online video *Sissies*: *Men in Nursing* (Bricca & Hingoan, 2011). In addition, they read two research articles by Dr. Annette Jinks, who created an instrument to measure student nurses' perception of attitudes and stereotypes of men in nursing (Jinks, 1993; Jinks & Bradley, 2004). Dr. Jinks provided e-mail permission to use the instrument and to make alterations consistent with cultural and generational differences noted since the development of the instrument in 1993. The modified instrument paralleled the original instrument and included demographic and open-ended questions.

Module 2

The data collection assignment occurred in Module 2. It was a two-step interactive hands-on exercise. At step one, all the students took the modified version of Men in Nursing Survey. Students provided feedback to improve the survey content, process, and format. The faculty made minor revisions to the survey based on student feedback. At step two, students received a participant recruitment email and distributed the survey link (revised version) to 10 currently licensed nurses, the responses to which were anonymous. Students were instructed to share the study information and survey link directly with nurse colleagues via their school or personal email or through social media or professional group open websites. By the end of the two-week data collection window, the online survey record showed a gross click of 1372 with 1227 valid responses from nurses across the country. Faculty assisted students with participant recruitment if they did not have easy access to colleagues. Evaluation of data collection was based on effort not responses and all students received credit for participation. The overwhelming response rate exceeded faculty expectations and we believe that the students and participants were motivated by the subject matter.

Module 3

Faculty presented and explained the statistical tests used to analyze the data and the resulting output needed to address specific research questions. Students worked in small groups to interpret and write up the statistical results that were prepared and presented by the faculty. Each group explored one descriptive and one correlational research question and submitted a draft report of findings. Faculty reviewed and provided feedback on the draft reports; then student groups revised and resubmitted for grading.

Module 4

In Module 4, students learned about the importance of dissemination through publication and presentations. Each group created a PowerPoint presentation of their findings. Faculty reviewed presentations and returned them to students to make revisions. After revisions, students presented their results at their place of employment or in other professional settings. Most students were able to present the results in a work-related unit or committee meeting or to a small group of colleagues during a break. One student presented to a cohort of new graduates attending a unit orientation. The students' supervisors or other professionals provided written evaluation of the students' presentation. The evaluation was emailed or faxed directly to the faculty and faculty shared appropriate remarks and recommendations with the students. Students who did not have access to a professional group for presentation submitted a video presentation and faculty provided evaluation feedback in place of a supervisor's feedback. All students who provided a presentation received credit for the exercise.

Results

Seventy students, 67 (96%) female and 3 (4%) male, were enrolled in three TS II course sections. The majority of the students worked in acute care with approximately 35% working in medical-surgical or acute care areas. All students had a bachelor's degree and one reported a master's degree (see Table 2).

Evaluation of project strategies

Students' perceptions of their experience with the educational project strategies in TS II were collected through a self-reported online survey developed by faculty (see Table 3). The survey captured the learning outcomes of the course and specific aspects of the project-based learning method, i.e., the research process, student activities, and statistics and dissemination. Questions on student overall experiences with the project and the TSII course were also included. Student responses were measured on a 5-point Likert scale from *1 = Strongly Disagree* to *5 = Strongly Agree*. Higher scores indicated a more positive perception of the educational experience. In addition, students were asked to provide feedback to improve the course and learning for future students. Of the 70 potential participants, 22 students completed the survey resulting in a 31% response rate. Table 3 reflects the survey items by subscale and the mean for each subscale as well as individual item means. Students scored their perceptions of the "Student Activities" highest with a mean (standard deviation) of 4.58 (0.49), followed by "General Perceptions" with a mean of 4.09 (0.92), the "Research Process" with a mean of 3.95 (0.66), and lastly "Statistics and Dissemination" with a mean of 3.85 (0.90) ranking the lowest.

Discussion

Most graduate level students do not have experience with the research process even though they espouse being an evidence-based practitioner. Students are expected to be able to translate evidence into practice, but to be able to do this, students must understand the process by which the evidence was generated in the first place. Cho and Shin (2014) have pressed the need for faculty to urgently "provide nurses with education for responsible conduct of research, which can be applied to empirical studies on evidence-based practice in clinical settings" (pg.

Table 1
Course content and assignments with integration of project strategies

Course Content	Didactic content assignments	Project strategies application assignments
Module 1 • Review of evidence based practice & qualitative research • Protection of human subjects • Overview of men in nursing research project	NIH "Protecting Human Research Participants" Critique of qualitative research article	View the video, "Sissies: Men in Nursing." Read the articles, Jinks, 1993 and Jinks & Bradley, 2004.
Module 2 • Quantitative research designs • Sampling in quantitative research • Data collection methods • Measurement and data quality	20 question quiz on major concepts of quantitative research applicable to understanding the evidence based practice	Complete modified Men in Nursing Survey and provide feedback. Share final Men in Nursing survey with colleagues.
Module 3 • Rigor and validity • Types of quantitative designs and statistical analysis ○ Descriptive ○ Correlational ○ Experimental/quasi experimental	20 question quiz covering rigor, validity, & major designs. 20 question quiz covering common statistical tests.	Group work: From the data analysis provided by faculty, propose two research questions and report statistical results to answer the research questions.
Module 4 • Overview of mixed methods • Systematic review and meta synthesis/ analysis • Integrating evidence into practice • Reporting research findings	20 question quiz covering mixed methods research and systematic reviews. Add 3 (new this semester) quantitative research articles to the evidence table begun in TS I.	Group work: Prepare PowerPoint presentation introducing the "Men in Nursing" project and presenting questions and statistical results for questions developed in Module 3. Individual work: Deliver the presentation to your colleagues at work or some other appropriate venue.

485). Hamilton (2010) used clinically based research projects to teach research principles to graduate nursing students. In Hamilton's study, the students felt that the experience helped them read research articles despite no experience in empirical data collection process.

The experience with the educational strategy supported student learning on the research process to aid in future review and critical appraisal of research evidence. Students were involved in multiple steps of the study including instrument revision, data collection, and interpretation and dissemination of the findings. The topic of the study, men in nursing, helped the students make application in the real world. They could use what they learned about gender bias and the new knowledge of the research concepts in their workplace. This strategy contrasts with other studies that prepare students to identify clinical problems entirely through the review of literature.

The results of the student perceptions of the learning methods indicated that the course was very meaningful in terms of appreciating the need for and process of protection of human subjects, the difficulties that can be encountered engaging research participants, the mechanics of interpreting research findings, and the presentation of research findings to colleagues in clinical practice. Considering the need for adult learners to be actively involved in the learning process, it is no surprise that students rated their perceptions highest on the Student Activities Subscale.

Table 2
Participant demographic information (number of valid responses in parentheses)

		Frequency	Valid %
Gender (70)	Female	67	95.7
	Male	3	4.3
Licensure/education (69)	RN, BSN	68	98.6
	Master's, RN	1	1.3
Area of work (69)	Med Surg	12	17.4
	Psych	2	2.9
	Ob/Gyn	6	8.7
	Pediatrics	6	8.7
	Critical care	12	17.4
	Emergency	5	7.2
	Community	3	4.3
	Education	5	7.2
	Other	18	26.1

The educational activities were very fast paced and the most difficult material and assignments were at the end of the project. A few students noted that the course moved too quickly, and they did not like working with partners on the data analysis and planning of the presentations. This may reflect an infringement of their need for independence in the learning process and the need to learn at their own pace. In addition, adults seek application to the real world and must recognize a direct relationship with what is being learned. The subject matter, men in nursing, provided the direct relationship for students to connect what they were learning with experiences in their professional environment. One student reported "I personally loved the gender analysis because it's a good topic and very interesting." Students perceived that the learning strategies helped them increase their understanding of research and somewhat increased their interest in research. They perceived greater comfort with the research process and had a greater appreciation for the problems that can occur in recruitment and data collection.

The students' perceptions related to their understanding of research, beliefs that they are able to pose a valid question related to a clinical problem, and confidence in their ability perform a literature review of the nursing evidence supports the inclusion of these or similar strategies for actively engaging students in aspects of a research project. Translation of nursing evidence into practice requires that the nurse have the requisite skills associated with research methods. Consistent with *Master's Essential IV*, these types of strategies can support and enhance the student's application of "…research outcomes within the practice setting, resolve practice problems, work as a change agent, and disseminate results (AACN, 2011, pg. 4)".

Summary

The purpose of this project was intended to engage students in research activities to reinforce their learning and understanding of

Table 3
Student perceptions of project-based learning in an online environment

Question	Mean
SS 1–1. The gender bias project has helped me understand the importance of nursing research and how it impacts nursing science.	4.09
SS 1–2. Assisting with the gender study has increased my interest in nursing research.	3.50
SS 1–3. Engaging in this gender bias research project provided a method for me to have a 'deeper' understanding of research.	4.00
SS 1–4. As a result of this project, I have more positive feelings about nursing research.	3.73
SS 1–5. I believe that I can perform a literature review related to a nursing research topic.	4.23
SS 1–6. I believe that I can 'word' a PICO question from a clinical practice problem.	4.14
Subscale 1. Research process	3.95
SS 2–1. I understand the importance of protecting human subjects during the research.	4.73
SS 2–2. I understand the importance and the role the IRB (Institutional review board) plays in protecting human subjects during the research process.	4.64
SS 2–3. I understand the challenges and difficulties that nurse researchers have when trying to recruit participants for nursing studies.	4.55
SS 2–4. I understand the importance of the participant understanding the study purpose.	4.59
SS 2–5. I understand that participants have rights during a study and may refuse to participate.	4.68
SS 2–6. Overall, the project has helped me appreciate the problems that can occur during the research process.	4.27
Subscale 2. Student activities	4.58
SS 3–1. I am more comfortable reading the statistic sections of a research article now than I was prior to the gender bias project.	3.82
SS 3–2. The gender bias project facilitated my understanding and ability of disseminating research findings in a written form.	3.86
SS 3–3. The project facilitated my ability to disseminate findings to a group with a PowerPoint.	3.86
Subscale 3. Statistics and dissemination	3.85
SS 4–1. Overall, the readings related to men in nursing facilitated my understanding of the quantitative methodology information that was found in the textbook.	4.09
SS 4–2. The assignments (project based and class) went well together and were related to the goals of the course.	4.05
SS 4–3. I learned a lot in this class.	4.14
Subscale 4. General perceptions of course	4.09

research process for the purpose of appraising and translating the evidence for practice. Adult Learning Theory guided the learning experience and provided a context for discussion of the evaluation results. The faculty felt the project was valuable and will repeat the project with modifications made as a result of faculty and student input.

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