Developing System-Level Awareness Through Virtual Clinical Learning

Deborah Merriam, Jacob M. Fisher, Amanda J. Cody, and Patricia A. Nirelli

Abstract

Lack of clinical sites and disparate experiences contribute to the challenge for RN-to-BS nursing programs to provide sufficient leadership and quality improvement opportunities. A virtual clinical learning experience using WordPress was developed as a faculty-graduate student think tank project and implemented in an RN-BS hybrid nursing leadership course. The unfolding case study created an interactive experience to portray use of systems thinking and transformational leadership. Mann-Whitney *U* analysis identified no significant difference in learning outcomes. The low-cost, easy-to-develop technology counteracted limited clinical sites, allowing for learning on the go with equivalent learning outcomes.

KEY WORDS Quality Improvement – RN-BS Education – Systems Thinking – Virtual Clinical Learning

Skills needed for today's nurses are multifaceted and complex. Nurses must be aware of physical, environmental, and organizational processes that affect patient safety and system outcomes. One of the requirements of a six-credit-hour hybrid RN-BS nursing leadership course included a quality improvement (QI) nurse observation (7.5 hours). As the number of RN-BS students grew, it became increasingly difficult to find adequate clinical placement sites, and like other schools of nursing, we turned to simulation for clinical learning. This virtual clinical learning experience (VCLE), which focused on leadership and QI, was developed by a faculty-graduate student think tank team with no prior website development experience. The web domain alone, www.leadrnme.com, signifies how all nurses are leaders.

Two nursing education students and one nursing leadership student used leadership and QI competencies in writing and editing scripts to be recorded in video and audio clips with embedded content. An open source website creation tool, WordPress, served as host to the unfolding case study. The VCLE provided affordable, interactive, and replicable learning easily downloaded on mobile devices, such as smartphones and tablets. Students completing the traditional observation or the VCLE had equivalent learning outcomes as demonstrated by student reflections.

Phillips, Stalter, Dolansky, and Lopez (2016) indicated the need for innovative teaching strategies to help students use systems thinking to enhance patient outcomes. Ross and Crusoe (2014) created and implemented a virtual health care system as a simple, cost-effective way to offset the shortage of adequate and disparate nursing leadership clinical placements. Advancements in educational pedagogies, such as simulation, have consistently demonstrated effectiveness in helping students achieve learning outcomes (Freina & Ott, 2015). The realm of VCLEs has a new importance in nursing education due to advancements in modern technology. This article reports on how we used the Plan-Do-Study-Act cycle in all aspects of the project.

PLAN: INSTRUCTIONAL DESIGN APPROACH

We conducted a literature review that focused on transformational leadership, system-level thinking, and simulation in nursing education. Kouzes and Posner's (2017) "Five Practices of Exemplary Leadership" were used to model how a nurse leader in the VCLE used transformational leadership to problem solve within a health care organization. Transformational leadership principles with systems-level awareness helped students understand their role in health care and promoted patient safety and improved outcomes (Phillips et al., 2016).

We selected WordPress based on affordability and ease of use. The think tank team compiled scripts (see Supplemental Digital Content, available at http://links.lww.com/NEP/A114) with an unfolding

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storyboard while considering learning objectives and key concepts. The three domains of learning and the International Nursing Association for Clinical and Simulation Learning's (INACSL) Standard of Best Practice: Simulation[SM] (INACSL Standards Committee, 2016) formed the design, implementation, and evaluation of the VCLE. Scripts compliant with universal design (University of Missouri, 2017) accompanied the audio and video recordings to ensure usability. One video needed to be rerecorded due to an error not caught in the proofreading.

We developed VCLE learning objectives, comparable to traditional clinical observations, to guide learning outcomes. Participants retrieved previously learned information and new information from the VCLE to navigate through the experience. Design features allowed for an interactive, progressive unfolding case study in which completion of the current page was required before advancing. Coordinated information delivery facilitated control of extrinsic variables of learning and improved overall learning outcomes (Van Merrienboer & Sweller, 2010). Built-in rationales provided additional information for all formative questions.

A post-VCLE reflective assignment allowed for summative evaluation. The reflections posted within learning circles in BlackBoard allowed participants to express perceptions of the VCLE and associated learning outcomes and served the purpose of debriefing and the assessment of learning. One participant comment, "Questions asked after the videos ensured participants understood the content and helped highlight the more important topics," supported the importance of both formative and summative assessment.

DO: IMPLEMENTATION

Pilot implementation of the VCLE took place in summer 2016 with 28 students. The VCLE, shared through a URL link, was designed to be compatible with a variety of electronic devices (e.g., smartphones and tablets) and to provide access flexibility. A quantitative survey upon completion of the VCLE sought feedback from nursing students, faculty, and nurse experts and leaders within the nursing field. The survey asked eight questions using a Likert response scale with scores ranging from 1 (*not at all*) to 4 (*very well*) to evaluate perspectives of usability as well as the attainment of learning objectives. Feedback from the survey was used to enhance the design and content of the VCLE for implementation in the fall 2016 and spring 2017 semesters ($N = 154$).

STUDY: EVALUATION

The revised VCLE used a modified quantitative survey to assess design elements, learning outcomes, and the participant's ability to utilize key concepts. A qualitative reflection followed completion of the VCLE. The post-VCLE evaluation scored 3.94/4.0 for understanding systems-level concepts, the ability to identify leadership behaviors to promote change within the system, and the ability to identify the use of leadership principles to improve patient care outcomes. A Mann-Whitney U analysis of the reflection scores between the traditional observations and the VCLE showed no difference in learning outcomes ($U = 698.000$, $p > .05$).

The VCLE was shown to be an additional learning strategy to reach the desired learning outcomes. Students stated: "I learned… that systems-level thinking is a process used to understand why things occur so that organizations can learn from them and never repeat the error again" and "Transformational leaders create valuable and positive change in their followers with the end goal of developing new leaders." The unfolding case study allowed students to see the impact of using transformational leadership principles within an organizational system.

ACT: REVISIONS AND RECOMMENDATIONS

Content and design changes to enhance learning outcomes were based on pilot feedback. First, questions were limited to one per webpage, and rationales were added to support correct and incorrect answers. Second, an enhanced focus on key concepts was needed to allow students to better identify principles. The Tellegami© application allowed the creation of brief, animated videos to be embedded within the VCLE; three 90-second videos were developed to highlight key principles of leadership and systems thinking. After revisions were made, student overall ratings for meeting VCLE objectives increased from 3.77/4 to 3.94/4. Design changes were supported by the increased rating from 3.68/4 to 3.94/4 for ease of use.

Future recommendations for design of a VCLE address sample size and validity of the evaluation tool. An increased sample size at multisite locations would strengthen findings and generalizability while ensuring validity of the survey. All scripts should be completed and proofed for accuracy before recording.

IMPLICATIONS AND CONCLUSION

The VCLE has been shown to be an effective learning tool. Interactions within the VCLE allowed students to see the impact of clinical reasoning where key concepts were applied. As all students were exposed to the same concepts and experiences, the experience is expected to enhance patient outcomes and reduce clinical disparities. Student satisfaction with the VCLE demonstrated a responsiveness to alternate learning activities, current with technological and educational trends. Further testing could verify the translation of learned clinical skills to future practice. The VCLE continues to be used to facilitate students' leadership and QI experience.

The low cost and ease of development of the VCLE are beneficial to schools of nursing facing disparities in clinical learning. It allows developers to facilitate the exploration of complex concepts in an accessible, affordable, and replicable way. We found that development of a VCLE helped students apply QI concepts to patient care. It allowed for learning on the go, outside the four traditional walls, while maintaining equivalent learning outcomes.

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