



Featured Article

Transformative Learning through Virtual Patient Simulations: Predicting Critical Student Reflections

A. J. Kleinheksel, MEd, PhD(c)^{a,b,*}

^aDirector of Instructional Design, Shadow Health, Gainesville, FL 32601, USA

^bDoctoral Candidate in Educational Technology, School of Teaching and Learning, College of Education, University of Florida, Gainesville, FL 32611-7048, USA

KEYWORDS

virtual patient;
Digital Standardized
Patient;
simulation;
reflective journaling;
self-reflection;
clinical reasoning;
computer based
learning

Abstract

Background: The Digital Clinical Experience™ is a simulation software that allows nursing students to interview and examine virtual patient and then write self-reflections on their performance.

Methods: A secondary data analysis was conducted on 130 master of science in nursing students' performance in the Digital Clinical Experience™ using a framework of situated cognition and transformative learning theory. Employing a within-stage mixed-model design, content analysis of structured self-reflections was conducted using Cook's Reflection Rating Rubric. Multiple regression was performed using self-reflection scores as the dependent variable; independent variables included time spent in simulation, lines of dialog, and primary and secondary clinical items discovered.

Results: Critical self-reflection indicating transformative learning was predicted by the number of secondary clinical items students uncover during their virtual patient interview. Yet, this level of self-reflection did not occur for students who discovered only the primary clinical findings.

Conclusions: This study presents evidence that virtual patient simulations can provide transformative learning experiences in nursing. However, to facilitate a transformative learning experience, these simulations must allow students to explore the presentation, history, and backstory of the virtual patient in depth, beyond superficial clinical findings.

Cite this article:

Kleinheksel, A. J. (2014, June). Transformative learning through virtual patient simulations: Predicting critical student reflections. *Clinical Simulation in Nursing*, 10(6), e301-e308. <http://dx.doi.org/10.1016/j.ecns.2014.02.001>.

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Self-reflection by students is a critical component to learning complex and multifaceted content, and is especially

important in the development and assessment of clinical reasoning skills (Anderson, 2010; Langley & Brown, 2010; Lasater & Nielsen, 2009; Mezirow, 1990; Plack, Driscoll, Blissett, McKenna, & Plack, 2005). The Shadow Health Digital Clinical Experience™ (DCE) is a web-based virtual

* Corresponding author: aj@shadowhealth.com (A. J. Kleinheksel).

patient simulation that affords nursing students the opportunity to interview, examine, document, and reflect on their experience with the Shadow Health Digital Standardized Patient™. The DCE is divided into a series of longitudinal modules, which correspond to the different components of

a health assessment, including taking a health history and system-based examinations. The DCE was used for the first time in Advanced Health Assessment courses by master of science in nursing (MSN) students at six universities in the United States during the fall semester of 2012. Although the software automatically generated and displayed quantitative assessment data on the clinical findings discovered by students after they interview and examine Digital Standardized Patient (DSP), there has been no systematic evaluation of the reflective journaling that students complete as part of each assigned module. To assess the quality of the reflections written within the DCE and explore which variables may influence successful, critical levels of reflection, this exploratory study evaluated students' self-reflections using the coding rubric developed by Cook (2010) (see Table 1).

Key Points

- A student's performance within their Digital Standardized Patient simulation predicted the quality of the self-reflection they wrote after the experience.
- More thorough exploration of secondary clinical findings was positively correlated to critical levels of self-reflection, whereas patient interviews that focused only on primary clinical findings were negatively correlated to the level of self-reflection.
- To facilitate effective simulations for the purpose of transformative learning experiences, virtual patients should provide a broad range of findings for students to explore.

This study employed an ex post facto research design to explore the following questions: (1) Is the quality of student reflections related to success within the History module of the DCE? (a) Is there a relationship between student reflection scores and the number of clinical findings discovered? (b) Is there a relationship between student reflection scores and the time a student spends asking the DSP questions? and (c) Is there a relationship between student reflection scores and the number of questions a student asks the DSP?

Literature Review

Virtual patients have been found to be a dynamic and cost-effective means of providing nursing students with standardized clinical simulations (Consorti, Mancuso,

Nocioni, & Piccolo, 2012; Cook & Triola, 2009; Cook, Erwin, & Triola, 2010). Virtual patients create an objective learning environment by presenting each student with an identical simulation scenario. Virtual patients provide students with a more uniform opportunity to assess their skills than standardized patient actors, who can insert biases or become bored with the repetition of performing the same simulation repeatedly with multiple students (Consorti et al., 2012; Cook & Triola, 2009; Johnsen et al., 2005). Another advantage of virtual patients is a more convenient simulation experience that can often be accessed asynchronously, which makes them ideal for distance education programs. Virtual patients are relatively new in the field of clinical simulations; however, their low cost in comparison with simulations using high-fidelity manikins or patient actors makes them appealing in the field of nursing education, where budgets are typically tight, and there is a shortage of educators (Cook & Triola, 2009; Cook, 2010). Studies conducted on virtual patients thus far have included qualitative, quasi-experimental controlled, and comparative designs, all of which found no significant difference between learning outcomes and learner satisfaction when compared with other methods of simulation (Consorti et al., 2012; Cook, Erwin, & Triola, 2010; Triola et al., 2006). Additionally, virtual patient simulations have been shown to yield large positive effect sizes when compared with no simulation (Cook, Erwin, & Triola, 2010).

The use of virtual patients in health professions education has been applied to a wide range of clinical fields (Arnold, Johnson, Tucker, Chesak, & Dierkhising, 2013; Forsberg, Georg, Ziegert, & Fors, 2011; McKeon, Norris, Cardell, & Britt, 2009; Stevens et al., 2006). Although, in most cases, the learning objectives of virtual patient simulations include the development or assessment of clinical reasoning skills, Cook and Triola (2009) have made the argument that demonstrating clinical reasoning is the only valid learning objective for a virtual patient simulation. Cook and Triola base their assertion on the observation that analytical thinking will mature an individual health care provider's practice and lead to safer, more effective patient care decisions. Although virtual patients are uniquely suited to develop clinical reasoning, the assessment of virtual patients most often employs an algorithmic approach to evaluation, scoring the completeness of information elicited by the student rather than evaluating nonanalytical processes (Cook & Triola, 2009).

Reflective journaling is another common strategy employed in the development of students' clinical reasoning skills (Anderson, 2010; Hendrix, O'Malley, Sullivan, & Carmon, 2012; Lasater & Nielsen, 2009). Self-reflections written as part of clinical rotations and simulation assignments have been well established as a successful activity through which nursing students can further their diagnostic abilities, strengthen their patient empathy skills, challenge assumptions and biases, and self-correct areas of weakness (Langley & Brown, 2010; Lasater & Nielsen, 2009;

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