



Virtual Reality Simulation Experiences in Health Assessment: A Mixed-Methods Explanatory Study Examining Student Satisfaction and Self-Confidence

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Overview and Objectives

The purpose of this mixed-methods study was to examine the relationship between virtual reality simulation (VRS) and student satisfaction and self-confidence in a health assessment laboratory course.

Research Question: What is the relationship between the use of a VRS health assessment experience and student satisfaction and self-confidence?

Design: Mixed Methods Explanatory Sequential:

- Phase 1: The Student Satisfaction and Self-Confidence in Learning Scale was administered at the end of a 13-week health assessment course that included 3 VRS experiences
- Phase 2: 1:1 semi-structured interviews were conducted to explore participant perspectives of the VRS experiences

Data Collection and Analysis

All students completed the Student Satisfaction and Self Confidence in Learning Scale survey. A convenience sample of 9 derived from this sample participated in a 1:1 semi structured interview.

Interview Questions:

- Describe your experience with headset-based virtual reality simulation (VRS) in the health assessment course.
- How would you compare the VRS experience with traditional health assessment skills practice in the lab course?

Descriptive statistics were calculated, then Spearman correlation coefficient was completed to assess the relationship between student satisfaction and self confidence scores. Brunner Munzel tests were conducted to assess satisfaction scores based on students' previous experience with VRS and frequency of VRS use.

Glaserian grounded theory approach using line-by-line coding and constant comparative analysis was to identify themes. Codes were grouped to assess commonalities and compared to identify relationships.

Table 1. Students' Satisfaction and Self-Confidence Scores

Variable		n	M (SD)	Mdn (IQR)	98.3% CI
Satisfaction Score		37	21 (3.75)	21 (4.00)	(20 to 23)*
Number of Times	≥ 4 times	18	22 (2.99)	22 (3.00)	(19 to 24)
	< 4 times	19	20 (4.25)	20 (5.50)	(16 to 24)
Learning	Course-based	26	20 (3.81)	20 (4.75)	(18 to 23)
	Practice-lab	11	21 (3.66)	22 (3.00)	(19 to 25)
Previous Experience	Yes	16	19 (4.84)	20 (7.75)	(13 to 25)
	No	21	22 (3.00)	22 (3.00)	(19 to 23)
Self-confidence Score		37	31 (5.94)	31 (9.00)	(29 to 35)*
Number of Times	≥ 4 times	18	33 (4.90)	35 (4.75)	(29 to 36)
	< 4 times	19	29 (6.31)	30 (9.50)	(24 to 36)
Learning	Course-based	26	30 (5.77)	30 (9.75)	(25 to 35)
	Practice-lab	11	33 (6.31)	35 (4.50)	(27 to 38)
Previous Experience	Yes	16	29 (6.85)	29 (11)	(24 to 38)
	No	21	32 (4.98)	34 (5.00)	(29 to 35)

Note. M = mean, SD = standard deviation, Mdn = median, IQR = interquartile range CI = confidence interval for the median score (satisfaction, self-confidence) by different groups of interest. * 95% CI for the overall median satisfaction and self-confidence scores, respectively.

Key Findings

Satisfaction and self-confidence scores were strongly correlated (as seen in Table 1).

VRS experiences of fidelity, communication, confidence, and competence, learning with peers, integrated learning and critical thinking, and a safe space to learn were related to students' satisfaction and self-confidence.

Communication Competence and Confidence: "I didn't know how to be comforting and still be professional. I remember the people in the room with me saying: 'Nope, try again.' And we just worked through different phases."

Learning With Peers: "It provided that nice collaborative feeling that our lab group missed during the formal lab sessions. It just got people feeling more open to learning, and open to making mistakes because it was a more fun environment."

Integrated Learning and Critical Thinking: "We have expected findings because we are pretty healthy... We haven't found anything weird on each other, but the thing with virtual reality is that Mark, the patient had a fracture and was also having chest-tightness so we have to check out what is going on. We could see and hear the sound of fluid in the lungs that was something different because it is not something you can hear with a classmate."

Conclusions and Implications

- This study provides evidence that VRS experiences engage learners in practicing professional communication, collaborative teamwork, integrated learning, clinical decision-making, and reflective practice.
- Researchers may examine influence of each phase of a typical simulation experience implemented using INACSL best practices to further inquire into the relationship between VRS experiences and student satisfaction and confidence.
- Studies on the implementation of SLS with VR have included the fundamentals of nursing; continued research is needed in a variety of content areas.

Participants and Settings

- Thirty-seven 2nd year pre-licensure nursing students completed a post-operative respiratory distress scenario using Elsevier's Simulation Learning System with Virtual Reality (SLS with VR).

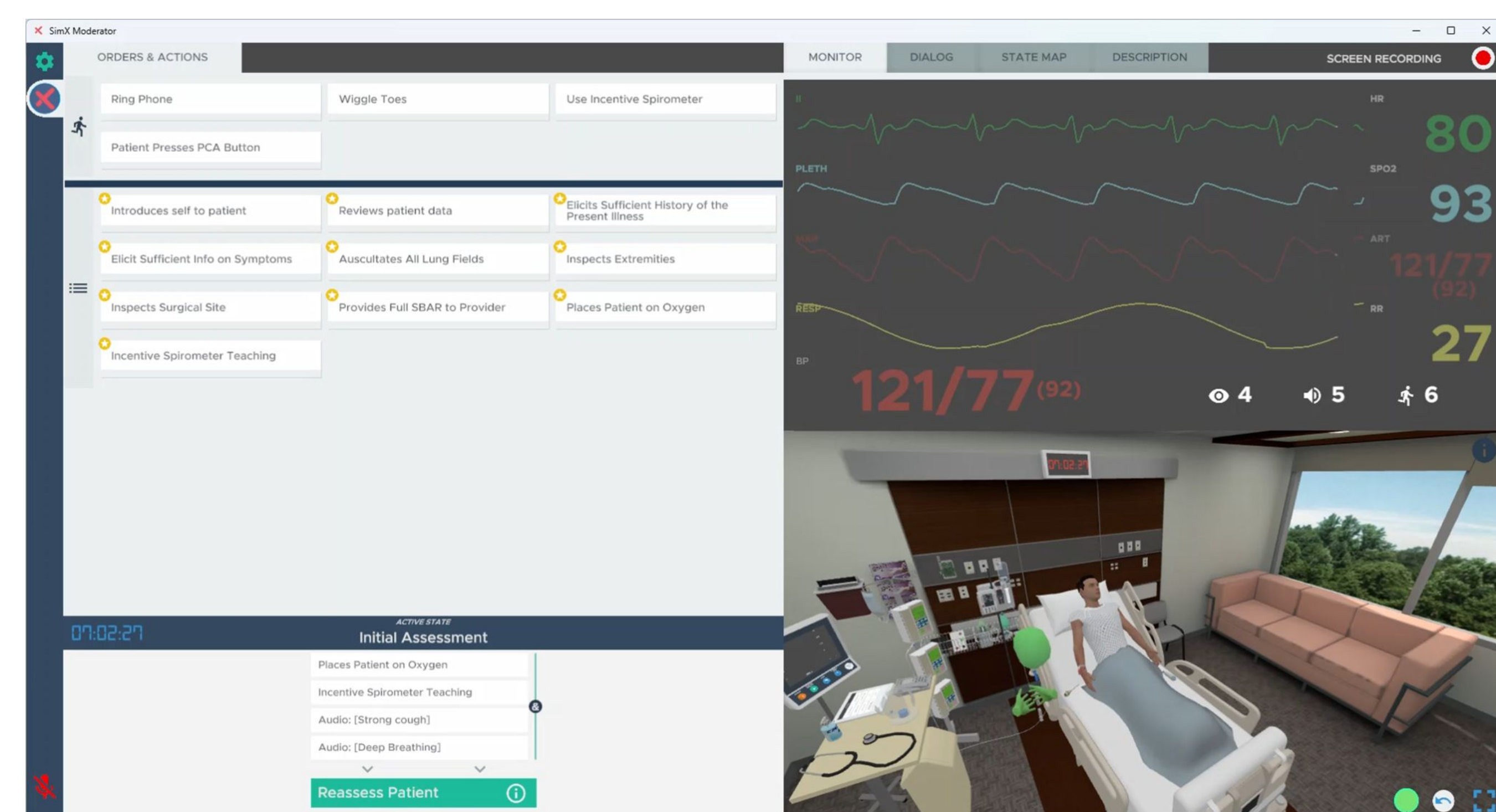


Figure 1. Moderator view of patient status, simulation progression and student activity in SLS with VR.