Medical Student Satisfaction with Using a Virtual Patient System to Learn History-Taking and Communication Skills

Adeline M. Deladisma MD, MPH[1]; Kyle Johnsen, BS[2]; Andrew Raij, MS[2]; Brent Rossen, BS[2]; Aaron Kotranza BS[2]; Mathew Kalapurakal, MS[1]; Sarah Szlam, BS[1]; James Bittner, MD[1]; Dayna Swinson, BSN[1]; Benjamin Lok, PhD[2]; D. Scott Lind, MD[1]
[1]Department of Surgery, Medical College of Georgia
[2]Department of Computer Information Science Engineering, University of Florida
Author email: adeladisma@mcg.edu

Background: Virtual patients (VPs) have the potential to enhance the efforts of health professions students in learning history-taking and communication skills by providing a means for standardized, repetitive practice in a safe environment. We have previously reported on a multidisciplinary effort involving medical students, clinical faculty, professional educators, and computer scientists to create and study interactive, life-sized virtual clinical scenarios in medical education, including an analysis of the use of synthesized vs. recorded speech in this venue.[1-3] With respect to medical education, VPs can elicit empathetic responses from students when compared to standardized patients (SPs) and can help reduce student anxiety when performing sensitive topic interviews, such as the sexual history, for the first time.[4-5] One goal of this project is to develop a system that can be independently accessed and thus user satisfaction will be an important factor in how readily this technology will be adopted. The purpose of this study was to examine learner perceptions of the virtual patient experience and their relationship to satisfaction with and potential future use of this system.

Methods: The VP system allows learners to interact with a life-sized avatar who presents with a medical complaint via a speech recognition and tracking system (Figure 1). Twenty-three third year medical students volunteered for the study. Baseline information on demographics and self-rated skill in history-taking was collected and students were randomized with respect to race of the VP (African American or Caucasian) and type of display (projection or head-mounted display). Each student completed a practice interview with Diana, a 23 year old female who presents with abdominal pain and then completed an interview with Edna, a 55 year old female who presents with a breast mass. Subjects were asked to rate the authenticity of the VP and the examination room and the educational value of the experience. These outcomes were dichotomized and compared using Fischer's exact test (α=0.05).

Results: Overall, the response to the VP was positive: the majority felt that it was a worthwhile educational experience (61%) and that they would use the system to practice their history-taking skills (65%). There were no significant differences in these outcomes by race of the VP, display type, learner gender, video game-playing experience, self-rated skill in history-taking, or number of patients (live or SP) previously seen with a breast mass. Students were less likely to rate their interaction a worthwhile experience if they felt that the virtual patient appeared to withhold information unnecessarily (29% vs. 75%, $p<0.05$) or if they felt more like they were in the lab rather than the virtual examination room (47% vs. 100%, $p<0.05$). Students were also less likely to use the VP for practice in the future if they felt that the VP did not answer questions in a natural manner (40% vs. 85%, $p<0.05$).

Conclusions: Despite some of the limitations in this developing technology (failures of speech recognition, limited expressivity of the virtual patient compared to a live patient, etc.), students are generally receptive to its use as an educational tool. VPs could serve as an adjunct to existing medical school curricula that make use of SPs, providing students another venue to practice their history-taking skills. The opportunity to use a system that is easily accessible will increase learner autonomy, an important concept in adult education theory.[6] In addition, a visualization feedback system (VIZ, Figure 2) is under development, which will enhance the educational value of the VP system. With continuing efforts to increase the fidelity of the interaction, VPs have great promise to augment efforts to teach interview skills.

References:

1. Dickerson R, Johnsen K, Raij A, et al. Virtual patients: assessment of synthesized versus recorded speech. *MMVR* 2006; 14:114-119.
2. Raij A, Johnsen K, Dickerson R, et al. Interpersonal scenarios: virtual ≈ real? *IEEE Virtual Reality* 2006:59-66.
3. Stevens A, Hernandez J, Johnsen K, et al. The use of virtual patients to teach medical students communication skills. *Am J Surg* 2006; 191:806-11.
4. Deladisma AM, Cohen M, Stevens A, et al. Do medical students respond empathetically to a virtual patient? *Am J Surg* 2007; 193:756-60.
5. Deladisma AM, Mack D, Bernard T, et al. Virtual patients reduce anxiety and enhance learning when teaching medical students sexual history-taking skills. Association for Surgical Education Annual Meeting 2007. Washington, D.C.
6. Williams GC and Deci EL. The importance of supporting autonomy in medical education. *Ann Intern Med* 1998; 129:303-8.

Figure 1: Virtual Patient Interaction

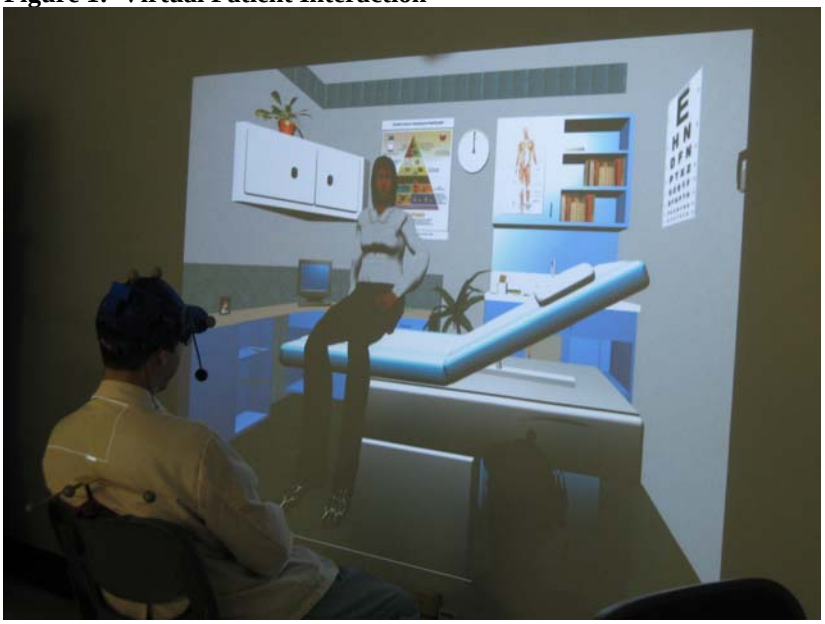

Figure 2: Visualization (VIZ) Unit