TRY-IT Reinert Center Mini-Grant 2015 Results Report

Grant Project: "Using Simulation-Based Learning to Improve Clinical Decision-Making Skills in Physician Assistant Students During Didactic Training"

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Course: Principles and Practice of Endocrinology, PAED 5250, Fall 2015

Project Description: The project involved use of a software program, iHuman, which simulates a patient encounter with a very high level of detail to enhance student learning and confidence in clinical decision making. The program allows students to ask questions related to the current illness and history, "perform" physical examination and obtain results, order labs and imaging and receive results, formulate a differential diagnosis with reasoning for each, write a patient problem list, write a note, and submit their work for evaluation. The full product allows almost complete customizability; what I purchased did not.

The grant allowed purchase of ten licenses for iHuman patient simulation software. This number required students to work in groups of four or five to complete the project. Students completed several cases during scheduled times in the classroom, and then completed follow-up work as homework. The project occurred during endocrinology, so the cases focused on diabetes, endocrine emergencies, and rare endocrine disorders.

The students were not graded on their work but full participation was expected (and received).

Background and Goals: Clinical education in the health sciences uses simulation-based learning to immerse students in a "real-life" clinical situation, while remaining in a risk-free environment. Faculty can evaluate students not only on diagnostic ability, but also ability to quickly and competently arrive at a diagnosis. Such exercises are often referred to as "OSCEs" (Observed Standardized Clinical Examinations), in which a student speaks with, examines and evaluates a patient while being evaluated in real time by a faculty proctor.

One of the drawbacks of the classic real-human simulated patient is cost. To pay standardized patients and the provide the appropriate number of proctors can end up costing thousands of dollars; multiply this by several courses a year and the department is seeing a huge portion of its budget utilized by such activities.

We know, however, that the simulated patient experience is highly valuable, and do not wish to eliminate it altogether. We are seeking alternatives that provide a similar experience but at a lower cost and with greater ease of use.

Further, much has been said about the level of stress experienced by university students. Our department sees this routinely, and although we look for ways to mitigate it where possible, the real-person "OSCE" is consistently reported as the most stressful testing experience during the didactic phase of our PA program. Finding methods to administer a similar test but with less perceived stress is desirable. (This was not mentioned in my initial grant application, but has become a matter for discussion in the department, and I did look at stress level when surveying students.)

What Worked?

Initially, students were very excited by the activity. Students were adept at using the software and quickly adapted to the controls used by the program. Faculty spent less than one minute per student "troubleshooting". This is superior to other software recently adopted by the college.

Students were highly intellectually engaged in the activity per their own reports. This was likely due to the time constraint but also to the detail of the software, which allowed students to pursue various lines of questioning, then

challenge them if they neglected to ask critical questions (Note – this feature could be turned off in testing mode, which would further replicate the standardized patient experience.)

Time constraints were helpful in creating pressure, "but not too much pressure". This is relevant; it shows the ability of the software to teach in a fashion similar to a standardized patient, but with far less student-reported emotional distress. (Note - this cohort of students did not report such an outcome)

Students worked collaboratively which appeared to enhance diagnostic accuracy and thoroughness. This is not incongruous with the ideal of collaborative nature of clinical learning and future practice. However, it was also a negative with regard to this project for reasons detailed below.

Students found the exercise to be realistic, especially with regards to patient interviewing and developing a differential diagnosis.

Ability to prioritize and provide interventions for a patient with multiple complaints was improved by the activity. as was the ability to develop a problem list. The distinction between a problem list and a list of diagnoses for a visit is a hard concept to teach, and the activity definitely helped increase understanding.

What Didn't?

I was not able to alter the cases provided (although I was allowed to choose them from a pool). This limitation proved to be significant, and markedly decreased students' satisfaction with the exercise and the product. My assumption the cases would be adequate was not correct – a couple of the cases required almost endless, and in many cases, needless, questioning. It was apparent the author and I did not share similar goals regarding the ability of a student to focus in on a line of questioning and branch off as directed by the information gathered; rather, the author required every question to be asked to gain "full credit", which was not logical. This was very frustrating to students, and to me.

If the product were purchased with a higher level of features, the purchaser can indeed write her own cases and impose her own requirements, which would be a very different experience.

The license cost of $100 each limited the total number of students who could log in at any one time, which turned out to be a major weak point in the project. Although there were benefits to working in groups, dissatisfaction with five people hunkering over one computer grew as time progressed. When students completed cases outside the classroom, the process of knowing who was using the login was time-consuming and bothersome to students. These negatives would be eliminated by use of individual licenses.

The students ended up reporting the activity took far too much of their time, especially for a non-graded component of an already demanding course. In retrospect, I should have assigned fewer cases, and requested general medicine cases with a more straightforward presentation for the students' first experience.

The vast majority students reported being very excited initially, and then having their enthusiasm dampened as the exercise wore on. This was attributed time and again to factors that could be changed if the proper product was utilized; students agreed that with "tweaks" this could be a highly rewarding, efficient learning tool.

Lessons learned: The use of medical simulation software in the classroom is likely to be very beneficial to students and faculty in terms of quality of education, time, cost, and intensity of experience. However, we will be very particular when choosing such a program to ultimately purchase. Pre-written and unalterable scenarios or tests seem unlikely to be satisfactory. If the SLU PA program were able to write and continually develop unique cases to fit our own objectives, the tool would work very well.

We will almost certainly adopt patient simulation software in the near future. The grant helped me “try it”, quite literally. I will be better able to identify desired product features, novel classroom applications including group work, individual work, pre- and post- lecture work, and use of the software for testing.

Although this group of students did *not* report the cases completed in this project would help to decrease their stress over OSCEs, the potential of such a tool to achieve that aim does exist and could likely be enhanced with the modifications I would apply.

Ultimately, the use of simulated, computer-based cases did appear to enhance student learning, as evidenced by improved (though marginally) test scores and subjective student comments.

Interactive simulated patient cases are not the future; this tool has just about become a standard of medical education. Nothing will replace an educational experience with real human standardized patients, but such activities are costly both in money and time. While our program would not eliminate in-person OSCEs with standardized patients, the use of simulated patient cases can replace some, and potentially augment others.