

Final Report

Using an eye-tracking device to teach nursing students to conduct surveillance and improve patient safety

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Proposal Description

Original Objectives

Eye tracking devices are playing an increasing pedagogical role in classrooms across the University of Massachusetts campuses. The purpose of this educational program was to evaluate the effectiveness of an eye-tracking device to teach nursing students to use selective attention processes (surveillance) to identify medical errors related to patient identification and patient monitoring. Our long term goal is to improve patient safety. Although the focus of this proposal was on teaching safe healthcare practices, we also sought to describe and evaluate an educational technology that is generalizable to other diverse settings (e.g., art, forestry, management, computer science, and engineering).

Background

The landmark Institute of Medicine (IOM) report indicated that as many as 98,000 people die in hospitals each year as a result of preventable medical errors (IOM, 1999). Efforts to improve patient safety include the development and testing of new technologies to reduce medical errors as well as the funding of researchers to develop, demonstrate and evaluate new approaches to improving provider education in order to reduce errors (IOM, 1999).

The nurse's role in the identification, interruption and correction of error, a term called recovery, is now being recognized as integral to patient safety (Henneman and Gawlinski 2004; Henneman et al, 2006; Rothschild, 2005; Rothschild et al., 2006). The use of an eye-tracking device offers a unique opportunity to teach student nurses effective methods to use surveillance to identify medical errors. Previous studies suggest that ongoing surveillance of the environment is used by nurses to recover medical error. (Henneman et al.,2006). Effective surveillance demands that the nurse selectively attend to patient and environmental factors in an appropriate sequence, double checking on some of them. If surveillance is effective, the nurse will pick up problems early and/or note potential problems.

Methods

The instructional technology evaluated in this project is the use of an eye-tracking device. Our project is designed to use the technology to assist students in performing effective surveillance which we believe will result in an increased ability to recognize potential errors related to patient identification and assessment.

Activities

Students were randomly assigned to control and experimental groups and participated in pre-intervention, intervention, and post-intervention simulation experiences. The

simulation/eye-tracking experience utilized a variety of previously developed structured simulation scenarios which were modified for this project. Each simulation included built-in errors related to patient identification and monitoring (e.g., lack of an allergy wristband). It was our hypothesis that students in the experimental group (eye-tracking) would identify significantly more errors ($P < .05$) during post-intervention phase than the control group.

Results

A total of 47 students participated in the study. Although we are still in the data analysis process, we did receive qualitative feedback from the students who participated. Fifty percent of the students assigned to the eye-tracker feedback group reported that the eye-tracker video was useful in giving them information about what they were or were not attending to during the simulation experience.

Our preliminary analysis suggests that the use of eye-tracking plus a verbal debriefing post the simulation, may be the most effective method of improving student performance.

Deliverables

We have developed simulations and have experience in the use of eye-tracking in clinical simulation settings that can be shared with colleagues in other UMass campuses.

Assessment

Our project was a complete success. We exceeded our goals in terms of learning about eye-tracking and its potential in assisting students. Of course, we are very proud that our project was honored with a meritorious award at the poster session.

Issues and further questions

One of our most significant findings was that the eye-tracking device is useful but challenging under conditions in which the subject is moving (versus static- such as sitting in a car or at a desk). These challenges have prompted us to investigate ways of using the technology under new (and important conditions).

Disposition of funds

We have currently spent \$1832.10 (73%) of our budget. We would like to request an extension so that we could use the remaining funds (\$1362.90) for statistician support and to allow one or two of our project members to attend a conference in the fall or spring.

Comments

This was an important project that would never have been possible without the support of the University of Massachusetts Information Technology Council. It is very difficult to obtain funding (especially in healthcare) that allow us to collaborate with other disciplines and re look at the "way we work". Our team believes that this funding will help us to obtain federal funding that ultimately will impact the current crisis in medical safety.