

RITE Proposal 2006
Handheld technology and Cooperation: Do they go hand in hand?
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Background

Nursing programs seek to deliver high quality and innovative academic programs that prepare nurses to function in today's healthcare industry. To meet this goal, the University of Tennessee College of Nursing in Knoxville aims to adopt innovative teaching strategies and technologies to promote the advancement of nursing students while preparing them for their future roles in a technology-rich and rapidly changing industry. Using mobile technology for learning, or m-learning, has been explored in various institutions. "Mobile learning allows teaching and learning to extend to spaces beyond the traditional classroom. Within the classroom, mobile learning gives instructors and learners increased flexibility and new opportunities for interaction." (Educause: ELI website, 2005).

Purpose

While research has demonstrated the usefulness and satisfaction of students who use PDAs as a reference tool during clinical situations, little is known about how the PDA and associated applications enhance collaborative learning in both the clinical setting and the classroom. The goal of this pilot educational action research project is to explore ways m-learning can be used to enhance collaborative learning in clinical and classroom nursing education for nurse practitioner students centrally located and at a distance. The results of this pilot will guide a future study whereby students at three universities will collaborate during clinical and classroom learning using similar tools, applications and instructional strategies.

Research Questions

Does the use of m-learning technology and techniques using a cooperative learning model enhance the didactic and clinical learning of nurse practitioner students?

Sample

The convenience sample for this pilot test (N=10) included graduate students enrolled in a pediatric nurse practitioner program (PNP) or a nurse educator course at the University of Tennessee, College of Nursing in Knoxville. All students enrolled in the PNP program and a graduate nursing education course were invited to participate. Five of the subjects owned a PDA and used it as a clinical reference tool. None of the subjects had previously used the PDA in a classroom or for learning in a clinical setting.

Methods

During spring and summer 2006, students from the University of Tennessee pilot tested PDAs, handheld applications, and teaching learning strategies that promote collaborative learning using action research methodology. This process of critical reflection occurred

in five phases: 1). diagnosing, 2). action planning, 3). action taking, 4). evaluating and, 5). specifying learning.

A pretest survey was administered to pediatric nurse practitioner students to determine their previous PDA experiences and their preferred learning methods regarding a PDA. Then, students were given PDAs loaded with clinical applications such as Harriet Lane®, Pediatric 5 Minute Clinical Consult®, Inforetriever®, and, ePocrates®, the communication application Skype®, and ClassInHand®, a classroom application supporting file sharing and polling.

The PDA was incorporated into classroom learning experiences and all students were encouraged to use their PDAs to reference evidence based practice during their clinical experiences. Students were required to complete case studies while using the PDA as a reference. They were also encouraged to cooperate with one another while working through case studies by sharing ideas, experiences, and resources with one another. While most of the cooperative learning occurred in class between students, the tool Skype® was available on the PDAs so that students could collaborate with one another in any wireless environment. This method of collaborative learning supported both chat and voice connection as well as file sharing. Students were also encouraged to share information such as articles and documents with one another using the advanced wireless and file sharing features on the PDA.

The last week of the semester, students completed the posttest survey. Students also participated in a 90 minute focus group to examine their own learning experiences by answering such questions as: 1) How did using a handheld and resources influence learning in this course? 2) How did cooperating with other learners using a handheld influence your learning? 3) What recommendations do you have to improve learning?

Analysis

Pretest and posttest surveys were compared using only descriptive statistics due to the small sample size. Focus group data were analyzed using multi-step heuristic method of evaluation. First, initial content analyses were performed at the focus group level to determine differences in subject responses in three phases: coding, categorizing, and creating a descriptive summary. Next, field notes, taken by the research assistant and the PI, were examined for themes with the goal of revealing and refining categories or themes. Finally, subjects proposed ways to enhance learning with the PDAs and associated applications during the focus group.

Findings

All of the students used their handheld either daily or three times a week. Students preferred resources were 5 Minute Clinical Consult® and ePocrates®. There were no changes between pretest and posttest perceptions in the usefulness of the PDA for classroom learning. All participating students valued the ability to share resources, emails, documents, etc with students using their handheld.

The focus group revealed that one participant was not given permission by her preceptor to use her PDA as a reference during her clinical experience. This impeded her ability to

fully use her PDA as a reference and therefore, she limited her use of the PDA altogether, including classroom case study discussions. All students wanted to continue using the PDAs to discuss case studies, share images from clinical experiences, build case studies for one another and as a resource during clinical experiences. Students suggested integrating more treatment discussion in the case studies while using the various PDA resources. All students believed that the handheld as a learning and clinical reference tool should be a part of the graduate curriculum and they also perceived that cooperative learning was a positive aspect of their course experience. Overall, students need technical assistance but will likely not use assistance that is provided outside of class. Instead, students prefer sharing difficulties and successes with peers and classmates.

Discussion

The PDA was used as a clinical resource and to synchronously connect students outside of the classroom. The PDAs were also used to access podcasts on various topics including video-based case studies. Students used the VoIP application (Skype) to connect with the instructor during virtual office hours and to connect with one another to discuss class issues, case studies, and to discuss ideas regarding class projects. ClassInHand, a classroom polling application, helped faculty and students gauge their understanding of concepts during class presentations.

As with all technology based projects, students experienced technical difficulties. Despite students having a help desk telephone number, emails for technical assistance and the PIs meeting with the students on a regular basis, none of the students reported their technical difficulties with the wireless access. Educators that use PDAs for learning must provide online resources, tutorials, and training because students will not necessarily seek the technical assistance that is available. Further, more practice and guided instruction in the classroom will identify some technical issues that might occur outside the classroom.

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