

# 2<sup>nd</sup> International Conference on Nursing & Healthcare

November 17-19, 2014 DoubleTree by Hilton Hotel Chicago-North Shore Conference Center, USA

## Facilitating online problem-based learning in nursing education using multimedia learning principles

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**Background:** Online courses are rapidly being incorporated into higher education as learning technology systems allow for student engagement outside the classroom setting. Problem-based learning (PBL) courses have traditionally been delivered within in-person, face-to-face contexts. However, in nursing education, with students practicing in diverse and distant geographical contexts, the need has arisen to move PBL to an online, or distributed, medium to facilitate course delivery. Online courses require the instructor and student's facility with learning technology. In addition, instructors must incorporate cognitive and education psychology principles of multimedia learning into their course design and implementation to optimize the student learning experience.

**Objective:** The purpose of this study was to evaluate the experiences of senior-level nursing students who had completed a final year, online PBL nursing theory course as part of their Bachelors of Science in Nursing (BScN) degree program requirements.

**Methods:** A mixed-methods approach was used to gather data around three areas of student experience: 1) course delivery and technology features; 2) learning of content and theoretical concepts within a distributed (online) PBL context; 3) professional identity formation within an online learning context.

**Results:** Quantitative results demonstrated high learner satisfaction with the course and with the online PBL format. Qualitative themes arising from the open-ended questions suggested that students perceived learning to be effective within an online context. Once logistical and technology issues were addressed, the courses were effective in facilitating student's interaction with colleagues, connection with the university, and independent learning and research of course content areas. Students did not perceive that taking an online PBL course in comparison to an in-class PBL course hindered their professional development.

**Implications:** Online PBL has great potential in health professions and university education to transform learning contexts, as the physical classroom is replaced by virtual classrooms which are spread across greater geographic distance. This learning is optimized when instructors apply principles of multimedia learning and cognitive load theory to course design and when facilitating online PBL sessions. Examples of instructional design approaches based on these principles, which are used to facilitate online PBL sessions, will be provided.

### Biography

Ruth Chen is an Assistant Professor at McMaster University, School of Nursing in Ontario, Canada. Her previous research involved pediatric asthma and pediatric pain management, and her clinical work as an NP/CNS was in the areas of anesthesia/pain management, and pediatric cardiology. She has a Bachelors Degree in Molecular and Cellular Biology from the University of California at Berkeley, a Master of Science in Nursing from Yale University, and a PhD from the Department of Clinical Epidemiology and Biostatistics (HRM) at McMaster University. Her research interests are in online education and health professional identity formation within technology-rich practice environments.

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