A Sports Injury Case Study Model – Capitalizing on Virtual Reality Technology
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Abstract
Virtual reality anatomy models were created to support an online case study approach to sports injury assessment and treatment in an undergraduate kinesiology program. Mixed method research established that while the case study was designed to supplement classroom experiences, students preferred to engage in the cases with selective scaffolding from the instructor.

This has led to a refined instructional strategy based on student feedback. The virtual reality models and case-based learning were found to be particularly effective for anytime – any place access to solving injury scenarios. This action research study has direct implications for the teaching of teachers who wish to capitalize on the benefits of both problem-based learning and technology integration.

Methods
• Participants: 14, 3rd and 4th year university students (10 females and 4 males) from the Sports Injury Assessment and Management Program at Acadia University in Wolfville, NS.

• An electronic survey was designed to obtain quantitative information regarding students: 1) comfort level with technology, 2) relative ease of accessing the case study online, 3) opinions about the structure of the case study educational tool, and 4) the reaction to using the 3-d anatomical models. The survey results were analyzed for emergent trends and based on these results, a standardized open-ended interview schedule was developed.

• From the sample, six students (4 female and 2 male) were randomly invited to participate in an interview. Interviews were also conducted with the course instructor at the beginning, middle, and end of the research process. These instructor interviews probed areas of technical challenges for students, informal student feedback on the quality and format of the case study educational tool, level of difficulty of the tool, and reaction to the Object2VR® anatomy models. The interviews were transcribed and coded in an iterative process which incorporated tallied notes regarding the earlier survey results.

• Finally, a single focus group of three students was invited to respond to the immediate results of the survey and interviews in an attempt to corroborate the results.

Results & Discussion
• This sample of students enjoyed using the multimedia sports injury assessment tool but suggested that it would be more effective if there was increased instructor involvement.

• Student suggestions to improve the multimedia technology – 1) incorporate more media so that future students could have an enhanced representation of the exact mechanism of injury, 2) the educational tool should be placed on a DVD so that the students would not be required to have access to high quality internet in order to use the program or anatomy models.

• Based on the quantitative and qualitative feedback received from the sample of students, we posited a process-oriented instructional model that encourages improved interaction between students and the instructor.

Conclusions
This action research study suggests that students find the Object2VR® movies to be a useful technology given that they provide flexible access to anatomical models to support their case studies. From the valuable feedback, it seems clear that students have a decided preference to adopt a teaching and learning model that invokes more instructor involvement and scaffolding of the diagnosis and treatment process.