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A new vision for teaching ophthalmology in the medical curriculum: The Virtual Ophthalmology clinic

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The Virtual Ophthalmology Clinic (VOC) is an innovative Computer Assisted Learning (CAL) module, on which students can sharpen their history taking and clinical reasoning skills by formulating a diagnosis and management plan on virtual patients with simulated eye conditions. The purpose of this study was to determine whether the VOC module, traditional modes of teaching, or some combination of the two is of greater educational effectiveness. A randomised controlled trial (RCT) was conducted with The University of Sydney medical students attending their clinical ophthalmology rotation. Students were randomly divided and assigned into either an experimental or control group. Students in both groups underwent the traditional ophthalmology teaching, in addition, students in the experimental group were given access to VOC. A twenty-item multiple choice ophthalmic knowledge based pre- and post-test and student satisfaction questionnaire was administered. The results demonstrated that the pre- and post-test mean scores increased significantly in both the intervention and control groups, however, a greater improvement was seen in the intervention group. The within subject change (Post-Pre) was highly significant with the change observed in the intervention group being significantly larger than that observed in the control group. The VOC module was highly regarded and enthusiastically received. Based on a statistically significant improvement in academic performance and highly positive student feedback, the implementation of VOC in the revised ophthalmology curriculum may provide the most effective and efficient teaching within the University of Sydney Medical Program.

Keywords: Computer Assisted Learning, evaluation, medical education, Virtual Ophthalmology Clinic.

Introduction

The rapid and exciting advances in educational technology have had a significant impact on the delivery of medical education. Computer Assisted Learning (CAL) programs are becoming increasingly sophisticated in their design to supplement medical curriculums and facilitate traditional modes of teaching, by creating promising pedagogical strategies for medical educationalists and new virtual clinical environments for learning. Novel educational technological modules have been developed as a result of curriculum time constraints and shortage of educators and teaching resources (Dhein, et.al, 2005). The Virtual Ophthalmology Clinic (VOC) is an innovative CAL program designed to enhance teaching and learning by allowing medical students to sharpen their clinical reasoning skills by formulating a diagnosis and

treatment plan on virtual patients with simulated eye conditions, in a safe learning environment before practicing on real patients. Advantages of CAL software include that it can be used without causing inconvenience, stress or discomfort for the patient having their eyes examined by students (Kuchenbecker et al, 2001). In addition, the VOC program offers flexibility and independence by enabling each student to learn in their own time and in off-site locations, creating better access for students in rural placements, while maintaining links with online tutors who provide regular and monitored feedback. To meet the needs of the learner, students are exposed to a broad range of conditions via virtual simulation, and any eye condition which students might not otherwise have the opportunity to experience in a clinical teaching environment, can be integrated into the program. Recurrent access to clinical case information allows for easy revision of material for exam preparation.
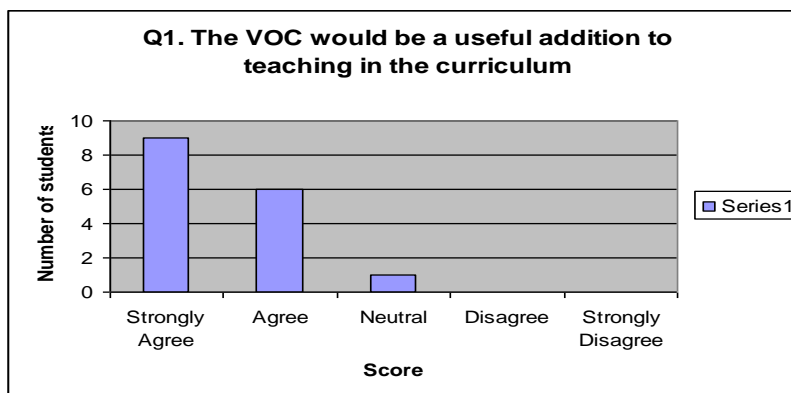
Purpose

This study reports on the evaluation and educational effectiveness of VOC compared with traditional methods of ophthalmology teaching and pedagogy in The University of Sydney Medical Program (USydMP).

Methods

USydMP students (n=147) attending their clinical ophthalmology rotation participated in an educational Randomized Controlled Trial (RCT) and were allocated into either the VOC intervention group (n=73) or the control group where students only received traditional methods of teaching and no access to VOC (n=74). The primary learning outcome was measured using mean scores comparison from a structured and validated 20-item Ophthalmic Knowledge Based pre- and post-test, administered before and after the educational intervention. Students' learning experiences and perception of VOC was evaluated and statistical analysis was performed using SPSS (Version 17.0).

Results

Based on academic performance the results demonstrate a statistically significant increase in the mean learning outcome with students using VOC (*55.70% to 72.14%, mean pre- and post test scores respectively),* a greater increase than with students undergoing traditional modes of teaching alone *(62.9% to 73.65%, mean pre- and post-test scores respectivel*y). Students' overall satisfaction of VOC was highly positive and enthusiastically received. Students' perceptions and satisfaction with the VOC are captured in the 3 graphs of Figure 1.
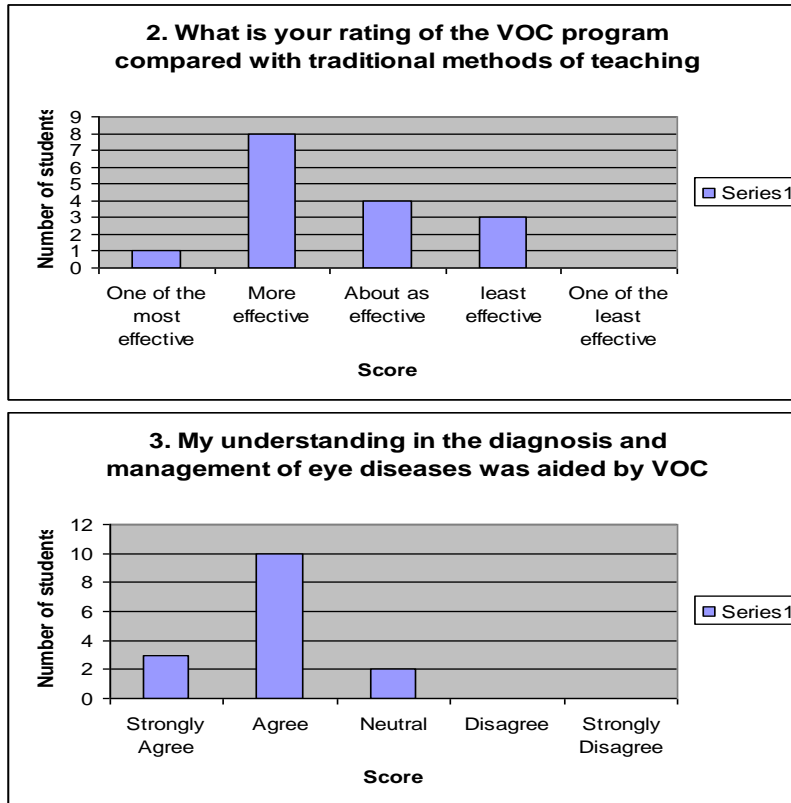
2. What is your rating of the VOC program compared with traditional methods of teaching

3. My understanding in the diagnosis and management of eye diseases was aided by VOC

Figure 1: Students' perceptions of the VOC

Conclusion

Implementation of VOC resulted in a statistically significant increase in medical students learning outcomes based on pre-and post-test scores. Evidence of improved academic performance and positive student attitudes towards the use of VOC suggest that its implementation in the curriculum may provide the most effective and efficient teaching for medical students. Such innovative programs should be encouraged as a time-efficient method for teaching and acquiring ophthalmic knowledge in a crowded medical curriculum.

References

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