Virtual reality and its use in ophthalmology teaching

Purpose: We developed a time-efficient, engaging way of teaching Ophthalmology to medical students utilising vir- tual reality (VR) technology. VR technology enables immersive, high-level simulation and allows for empathy based-learning, both of which enhance student engage- ment, satisfaction and thus learning outcomes.

Method: A novel VR program was developed for the undergraduate medical course to enable the study of oph- thalmology through guided and self-experiential explora- tion of visual impairments. The program utilises filters superimposed on ‘real world’ visual scenes to allow stu- dents to experience visual changes resulting from various ocular and neuro-ophthalmic conditions. The program was accessed in class-time, using the students' own smartphones, and University-provided virtual reality goggles. The pedagogical application of this novel teaching method was carefully designed using evidence based data and clinical ophthalmological expertise. This is one of the first examples of VR immersion with specific learning out- comes used for large-scale teaching in Australia.

Results: We surveyed 80 respondents, 50 female and 30 male. Understanding of the topic was rated as 3.83
± 1.74 before and 7.29 ± 1.15 after the lecture from a scale of 0-10. Assessment through the virtual presence questionnaire (Witmer et al. 2005) showed strengths and challenges of using the technology. Results show both increased student engagement and increased learning efficiency. The tutorial received positive feedback in rela- tion to student motivation and satisfaction with scores of
5.14 ± 0.86 and 5.15 ± 1.04 respectively from a scale of 0-6.

Conclusion: VR technology allows for self-experiential and empathy-based learning which is known to engage and motivate students for further self-guided studies and increases learning efficiency.