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BRIEF COMMUNICATION

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A pilot project evaluation of a novel heads-up viewing system compared to desktop microscopes commonly used for ophthalmic simulation

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Eye; https://doi.org/10.1038/s41433-023-02414-1

Engagement with ophthalmic simulation enables surgical skills to be developed outside the operating theatre until competence is achieved [1–3]. There are an ever-expanding range of bespoke model eyes available, but minimal development in appropriate viewing solutions. In the UK, ophthalmic simulation has moved from large and expensive traditional operating microscopes to utilising much smaller and significantly cheaper table-top microscopes (STEMI 305; Zeiss) [4]. However, as the STEMI is not designed as a viewing system, there are issues with poor ergonomics, and a limited image range and projection for supervision. We became aware of a novel alternative laboratory option—the Deep Reality Viewing system (DRV; Vision TriTeq), which permits "heads-up" viewing in 3D without glasses, with an ergonomic design and a wide field of view [See Fig. 1].

To evaluate the DRV system compared to the STEMI microscope through real-world comparisons, West of Scotland ophthalmic trainees were asked to complete a set task (corneal incision and suturing) using both systems and to evaluate them based on initial impressions, system-specific images, usability and task specific evaluations, using a 5-point Likert scale (1: very poor to 5: very good). Scores were compared using Wilcoxon signed ranks test. 20 trainees participated in the study (8 female, 12 male) between January and July 2022. The DRV scored more highly for system-specific images (19/20 DRV vs 15/20 STEMI; $p = 0.00072$), usability (40/50 DRV vs 31/50 STEMI; $p = 0.00016$) and task specific evaluation (21/25 DRV vs 20/25 STEMI; $p = 0.00128$). Free text comments reported more ergonomic design with a wider field of view and greater supervisor potential to be significant benefits of the DRV system. Ease of viewing surgical tasks in 3D without additional glasses/headset was also appreciated, but without the high cost of theatre-based microscope equipment [5].

We have shown in this simple pilot study that the DRV system is effective as a viewing aid to ophthalmic microsurgical simulation and preferred by our trainees to the currently used STEMI desktop microscopes. Although not portable, the ergonomics and supervision potential make the DRV an attractive addition to enhance ophthalmic simulation activity or skill transfer courses in the future.



Fig. 1 Photo illustrating viewing equipment currently used for ophthalmic simulation in Glasgow. Note the larger image and heads up display of the DRV system compared to the smaller STEMI microscope.

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AUTHOR CONTRIBUTIONS

DL had the initial idea. JH and CS organised the training event and drafted the article. DL revised the article and provided senior support. All authors agree with the final submitted version.

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Received: 19 September 2022 Revised: 12 December 2022 Accepted: 20 January 2023
Published online: 02 February 2023

COMPETING INTERESTS

The authors declare no competing interests.

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