

Enhancing Undergraduate Ophthalmology Teaching Through Virtual Reality

Integrating the Eyesi Direct Ophthalmoscope Simulator

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BACKGROUND & PROBLEM STATEMENT

Direct ophthalmoscopy is a core clinical skill required of all doctors

Yet, **medical students consistently report low confidence** in performing fundoscopy.

The GMC expects newly qualified doctors to competently perform fundoscopy under indirect supervision.

Despite this, ScotGEM Y3&4 students receive **no formal ophthalmology placements**, limiting opportunities to practise and consolidate learning under specialist observation.

The Solution: VR Simulation

The Eyesi Direct Ophthalmoscopy simulator provides:

- High-fidelity retinal visualisation
- Safe, repeated practice without patient discomfort
- Real-time feedback and performance tracking
- Instantaneous exposure to diverse pathologies

AIM

To evaluate the educational impact of the Eyesi simulator on medical students' confidence and perceived competence in direct ophthalmoscopy

METHODS

Participants: 122 medical students (Year 4 MBChB and Year 3 ScotGEM, University of Dundee)

Intervention: Two-hour simulation-based workshops in small groups (4-8 students). Students practiced on Eyesi simulator examining normal fundi and pathologies (swollen optic discs, CRVO, CRAO, proliferative diabetic retinopathy) with real-time facilitator feedback.

Assessment: Anonymous questionnaires (Likert scales + free text) assessing confidence, competence, and engagement via Microsoft Forms

KEY RESULTS

98%

felt able to perform ophthalmoscopy with indirect supervision

100%

reported increased competence in fundoscopy

100%

Enjoyed the simulation session

100%

Recommended integration of simulator into curriculum

n = 122 medical students | 100% response rate | All outcomes were self-reported post-intervention

Confidence Boost

89% strongly agreed + 11% somewhat agreed that they felt more confident performing fundoscopy after simulator training

Knowledge Gain

87% strongly agreed + 13% somewhat agreed that simulator training increased their ophthalmology knowledge

Future Interest

79% expressed interest in attending additional simulation sessions

Student Feedback Highlights:

"Clear obvious visualisation" • "Improved confidence and understanding of what I'm looking for" • "Immediate and ongoing feedback" • "Gained confidence...I WANT these skills in an OSCE now" • "Should be integrated earlier in the curriculum"

DISCUSSION & CONCLUSIONS

Key Discussion Points

- ✓ VR simulation addresses the training gap caused by limited clinical exposure and patient availability
- ✓ Aligns with Kolb's experiential learning theory - supporting active experimentation, reflection, and practical application
- ✓ Reduces learner anxiety by providing psychologically safe practice environment
- ✓ Complements (not replaces) traditional patient-based teaching

Conclusions

- The Eyesi simulator significantly enhances student confidence and perceived competence in direct ophthalmoscopy
- VR simulation provides safe, repeatable practice essential for developing visuomotor skills
- Integration into undergraduate curricula aligns with GMC outcomes and prepares students for clinical practice
- **Future work: objective skills assessment and longitudinal retention studies**

LIMITATIONS

- Self-reported outcomes only
- No pre-simulation baseline
- No objective skill assessment (yet)
- Single institution study

KEY REFERENCES

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