

# Assessing the effectiveness of undergraduate ophthalmic assessments in the UK: A literature review

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During 2008–2009, 300,000 patients presented to hospital emergency departments in the UK with eye conditions. This rose by nearly 200,000 over the next decade. As the population ages, the prevalence of eye disease increases [1,2]. However, the stake ophthalmology holds within the undergraduate curriculum continues to fall internationally [3–5]. From 1996 to 2006, the estimated time spent attached to undergraduate ophthalmology teaching in the UK fell by 45% [6,7].

Furthermore, many medical schools have transitioned from lecture-based to problem-based learning, where learners are self-directed and self-motivated [8]. In this modern curriculum, assessments play an important role in determining the depth and breadth of students' ophthalmic knowledge [9]. This literature review aims to understand how assessments are used to facilitate education in the UK undergraduate ophthalmic curriculum.

## Methods

### Search strategy

The search terms included 'Exp Ophthalmology, Ophthalmology.mp' and 'exp students, medical, Medical-Student, Medical student, undergraduate' and 'UK, United Kingdom, Great Britain'. The search strategy was implemented on Medline and PubMed (1946–April 2023) on 12/04/2023. The reference list of each included article was hand-searched to further identify relevant articles. The Royal College of Ophthalmologists' website was also hand-searched to identify relevant articles.

### Selection criteria

A single reviewer screened each title using Rayyan [10]. Full texts of included articles were reviewed against selection criteria. Inclusion criteria: (1) undergraduate ophthalmology assessments. Exclusion criteria: (1) non-UK studies, (2) not related to ophthalmology, (3) full text unavailable.

### Data extraction and quality assessment

A single reviewer read each article and identified contents which related to three themes: (1) assessment of learning, (2) assessment for learning, and (3) assessment for selection.

## Results

### Papers selected for inclusion

Initial literature search returned 32 abstracts. From the abstract screening process, one abstract was excluded due to taking place in Australia. Thirty-one publications were selected for inclusion.

### Assessment of learning

As most doctors receive no postgraduate training in ophthalmology [11], undergraduate training becomes essential for recognising, managing, and appropriately referring ophthalmic patients. The Royal College of Ophthalmologists has outlined specific competencies expected from trainees at the completion of foundation training [12]. Medical schools can develop assessments aligned with these competencies, ensuring graduates possess the core skills needed for safe practice.

An old, and likely outdated study indicated that only 55.1% of UK medical schools include ophthalmology in written exams [7]. This limited emphasis may contribute to a perception of inadequate undergraduate ophthalmic education, as reported by 78% of primary care doctors [7]. To compensate, students might resort to voluntary assessments as a learning tool.

### Assessment for learning

Assessments can drive deeper learning by engaging students with complex material. The Educational Project in Ophthalmology and Dermatology (EPOD) study demonstrated that voluntary assessments could improve perceived knowledge and stimulate interest in specialties like ophthalmology [13]. In this study, students showed a statistically significant increase in perceived knowledge after taking a voluntary exam. However, the EPOD study recognises that voluntary exams may compete with mandatory examination which discourage participation. This highlights the challenge of integrating voluntary assessments effectively within a busy curriculum.

Feedback is another crucial element of assessments for learning. The EPOD study emphasised the importance of feedback in the learning process. Contrastingly, the widely popular Duke Elder examination provides no personalised feedback, which may limit its effectiveness as a learning tool [14]. This disparity may be due to the resource-intensive nature of feedback for

large-scale assessments, where the Duke Elder exam prioritises inclusivity over personalised learning feedback.

### Assessment for selection

The Duke Elder examination plays a notable role in the selection of candidates for ophthalmology training, designed to challenge students and identify those with potential for further specialisation. A study found that 29% of the top 20 Duke Elder exam performers entered ophthalmic training, suggesting a strong association between exam success and specialist training selection [15]. However, causality cannot be established, as these high-achieving students may possess other attributes linked to successful training applications.

Further complicating the picture, another study found no correlation between Duke Elder exam performance and success in ophthalmology training, with other factors, such as involvement in ophthalmology societies, having a more substantial impact [16]. The Duke Elder exam is one of many components in a holistic selection process that includes clinical experience, research publications, quality improvement projects, and multi-source feedback [17]. Thus, while assessments like the Duke Elder exam play a role, they are part of a broader evaluative framework designed to identify well-rounded candidates for ophthalmic training.

### Discussion

The increasing prevalence of eye conditions demands that future clinicians are adequately prepared to manage ophthalmic cases. However, the declining emphasis on ophthalmology in the undergraduate curriculum, coupled with limited summative assessments, has led to perceptions of inadequate training. Efficient use of limited teaching time through strategically designed assessments could enhance ophthalmic knowledge among medical students.

Voluntary examinations offer a means to compensate for curricular gaps, though their success depends on balancing academic demands and providing timely feedback. National examinations like the Duke Elder must weigh the benefits of inclusivity against the resource demands of providing comprehensive feedback. As a tool for learning, assessing, and selecting future ophthalmologists, the Duke Elder exam's effectiveness requires further evaluation to ensure it meets its intended educational and selection objectives [14].

Future research should aim to correlate Duke Elder examination performance with postgraduate clinical competence,

potentially using outcome measures such as surgical proficiency assessments and clinical evaluations by consultants. Understanding the relationship between undergraduate assessments and real-world clinical performance will be crucial in refining ophthalmic education and training strategies.

### Conclusion

Effective assessments are essential in undergraduate ophthalmic education, serving to enhance learning, knowledge retention, and guide career choices. Assessments like the Duke Elder examination, while valuable, should be part of a broader strategy to develop confident, competent, and well-prepared generalists and ophthalmologists. Ensuring alignment between assessment methods and desired educational outcomes will be key to optimising ophthalmic education for future healthcare needs.

### References

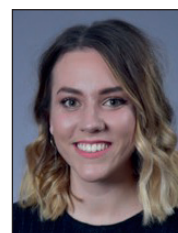
1. Pezzullo L, Streatfeild J, Simkiss P, Shickle D. The economic impact of sight loss and blindness in the UK adult population. *BMC Health Serv Res* 2018;**18**(1):63.
2. Emergency eye care Commissioning Guidance. Royal College of Ophthalmologists. <https://www.rcophth.ac.uk/resources-listing/emergency-eye-care-commissioning-guidance>
3. Hill S, Dennick R, Amoaku W. Present and future of the undergraduate ophthalmology curriculum: a survey of UK medical schools. *Int J Med Educ* 2017;**8**:389–95.
4. Mottow-Lippa L. Ophthalmology in the Medical School Curriculum: Reestablishing our Value and Effecting Change. *Ophthalmology* 2009;**116**(7):1235–6.
5. Quillen DA, Harper RA, Haik BG. Medical student education in ophthalmology: Crisis and opportunity. *Ophthalmology* 2005;**112**(11):1867–8.
6. Baylis O, Murray PI, Dayan M. Undergraduate ophthalmology education—a survey of UK medical schools. *Med Teach* 2011;**33**(6):468–71.
7. Shuttleworth GN, Marsh GW. How effective is undergraduate and postgraduate teaching in ophthalmology? *Eye (Lond)* 1997; **11**(Pt 5):744–50.
8. Trullas JC, Blay C, Sarri E, Pujol R. Effectiveness of problem-based learning methodology in undergraduate medical education: a scoping review. *BMC Med Educ* 2022;**22**(1):104.
9. Albert DM, Bartley GB. A proposal to improve ophthalmic education in medical schools. *Ophthalmology* 2014;**121**(6):1157–9.
10. Ouzzani M, Hammady H, Fedorowicz Z, Elmagarmid A. Rayyan—a web and mobile app for systematic reviews. *Syst Rev* 2016;**5**(1):210.
11. Kilduff C, Lois C. Red eyes and red-flags: improving ophthalmic assessment and referral in primary care. *BMJ Qual Improv Rep* 2016;**5**(1):u211608.w4680.
12. OST Curriculum 2024 approved documents. Royal College of Ophthalmologists (2024). <https://www.rcophth.ac.uk/training/ophthalmic-specialist-training/curriculum-documentation>
13. Nour R, Jobling K, Mayer A, Babikir S. How does participation in a voluntary prize exam affect medical students' knowledge and interest in ENT, plastic surgery, ophthalmology and dermatology? *BMC Med Educ* 2020;**20**(1):387.
14. Duke Elder Undergraduate Prize Examination. The Royal College of Ophthalmologists. <https://www.rcophth.ac.uk/examinations/duke-elder-undergraduate-prize-examination>
15. Joshi L, Shanmuganathan VA, Kneebone RL, Amoaku W. Performance in the Duke-Elder ophthalmology undergraduate prize examination and future careers in ophthalmology. *Eye (Lond)* 2011;**25**(8):1027–33.
16. Hsiao AM, Tatham AJ. Factors at medical school influencing students' decisions to pursue a career in ophthalmology. *Eye (Lond)* 2018;**32**(6):1005–7.
17. Severn Postgraduate Medical Education: Evidence Folder. Severn Deanery. <https://www.severn deanery.nhs.uk/recruitment/vacancies/show/oph-st1-25/evidence-folder-lib>

[All links last accessed February 2025]

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