

Main Article

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How do medical students want to learn ENT? Perspectives from a consensus forum

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Abstract

Objective. The UK Medical Licensing Assessment curriculum represents a consensus on core content, including ENT-related content for newly qualified doctors. No similar consensus exists as to how ENT content should be taught at medical school.

Method. A virtual consensus forum was held at the 2nd East of England ENT Conference in April 2021. A syllabus of ENT-related items was divided into 'Presentations', 'Conditions' and 'Practical procedures'. Twenty-seven students, 11 foundation doctors and 7 other junior doctors voted via anonymous polling for the best three of nine methods for teaching each syllabus item.

Results. For 'Presentations' and 'Conditions', work-based or clinical-based learning and small-group seminars were more popular than other teaching methods. For 'Practical procedures', practical teaching methods were more popular than theoretical methods.

Conclusion. Students and junior doctors expressed a clear preference for clinical-based teaching and small-group seminars when learning ENT content. E-learning was poorly favoured despite its increasing use.

Introduction

Innovations in medical education have allowed a shift away from traditional teaching methods, such as the didactic lecture, to more modern methods, including simulation, technology-enhanced learning and e-learning.¹ The variety of options available gives rise to questions about how these teaching methods can be most appropriately used.

Previous work has suggested that the Generation Z demographic cohort (born after 1997²), which includes most of the cohort of medical students currently in education or soon approaching the foundation programme, prefer learning by 'doing' (e.g. working through examples, practical experience) rather than by 'listening' (e.g. classroom-based lectures), and teachers are preferred to be facilitators rather than lecturers.³ However, within UK ENT undergraduate education, one study found that activities with higher perceived educational value, including clinical teaching, role-play and model-based teaching, were offered less frequently.⁴

There are practical constraints on undergraduate medical education, such as a scarcity in allocated teaching time, which make it impossible to utilise all teaching methods for every aspect of the curriculum. Instead, the most appropriate methods must be selected, which may vary based on the content. This is particularly pertinent to ENT. Despite ENT conditions being the primary presentation in approximately 10 per cent of adult general practitioner consultations⁵ and up to 50 per cent of paediatric general practitioner consultations,⁶ as well as accounting for nearly 377 000 accident and emergency attendances in 2015/16,⁷ ENT is often underrepresented in UK medical school curricula. A 2012 survey found that only 16 of 26 UK medical schools offered ENT rotations, with the average length being 8 days,⁸ while a 2011 survey found 444 newly qualified doctors only received an average of 8.4 days of ENT teaching or experience at medical school.⁴ The coronavirus disease 2019 (Covid-19) pandemic further restricted this: under pressure to deliver teaching remotely, educators were required to prioritise areas for face-to-face teaching.⁹

Knowledge of key ENT topics is crucial for safe medical practice. The implementation of the national UK Medical Licensing Assessment, which individuals must pass to join the medical register, represents a consensus on the core knowledge, skills and behaviours required for an incoming foundation doctor, including a number of topics related to ENT.¹⁰ In addition, the General Medical Council (GMC) publishes a 'Practical Skills and Procedures' supplementary curriculum containing ENT-related items.¹¹ The Student and Foundation Doctors in Otolaryngology developed an undergraduate curriculum in 2014 to assist students in identifying important topics.¹²

Objective

While the required undergraduate ENT-related content has been clearly set out, there is no similar consensus on how this should be taught. Studies have suggested e-learning and simulation workshops are perceived by students as suitable for ENT training,^{1,13-15} but evidence demonstrating optimal and preferred teaching methods for delivering specific areas of this undergraduate content is lacking.

The objective of this consensus forum was to establish medical students' and foundation doctors' preferred methods of teaching delivery for specific areas of the core ENT syllabus contained within the UK Medical Licensing Assessment curriculum and the GMC supplementary practical procedures.

Materials and methods

Ethical considerations

The Health Research Authority Decision Tool confirmed that National Health Service Research Ethics Committee approval was not required. Informed consent was obtained from all participants prior to participation in the consensus forum. This study followed the principles of the Declaration of Helsinki.

Reporting guidelines

There are no reporting guidelines relevant to consensus methodology within the 'EQUATOR' (Enhancing the Quality and Transparency of Health Research) network.

Design

Syllabus content

Items relevant to ENT were extracted from the UK Medical Licensing Assessment curriculum¹⁰ and the GMC 'Practical Skills and Procedures' supplementary curriculum¹¹ by consensus of four of the study authors (EW, MC, NHT and BVT), including items listed under other specialties (e.g. thyroid nodules, listed under 'Endocrine and metabolic'). The selected items were classed as 'Presentations', 'Conditions' and 'Practical procedures', as in the curricula.

Presentations, defined by the UK Medical Licensing Assessment as 'the signs, symptoms, investigation results and other relevant patient-related issues typically seen by doctors in a first appointment', were grouped by category (e.g. 'Nose'). Conditions, defined by the UK Medical Licensing Assessment as 'pathophysiological diseases or clinical diagnoses typically seen by doctors in a first appointment', were also grouped by category (e.g. 'Infections'). Because of time constraints and the potential for decision fatigue, conditions were organised into subcategories (e.g. 'Infections' were organised under 'Ear', 'Nasal/sinus', 'Throat' and 'Other'). The consensus forum treated each subcategory as a distinct syllabus item. As there were only two relevant practical procedures, these were not categorised. This collated and organised list of presentations, conditions and practical procedures will henceforth be referred to as the 'core ENT syllabus' (Table 1).

Teaching methods

There are numerous potential ways that teaching methods can be categorised. The study team created a list of nine teaching methods (Table 2) based on the Teaching Approaches Menu created by Sheffield Hallam University¹⁶ and by reviewing

Table 1. Core ENT syllabus

Syllabus item	Category	UKMLA curriculum items, & GMC Practical Skills & Procedures supplementary curriculum items
'Presentation' Defined by the UKMLA as 'the signs, symptoms, investigation results & other relevant patient-related issues typically seen by doctors in a first appointment'	Nose	Anosmia Ear & nasal discharge (non-bloody) Epistaxis Nasal obstruction Snoring
	Ear	Hearing loss Tinnitus Dizziness/vertigo Painful ear
	Head & neck	Neck lump Hoarseness & voice change Stridor Cough Sore throat Swallowing problems Facial pain Facial/peri-orbital swelling Allergies Lymphadenopathy
'Condition' Defined by the UKMLA as 'pathophysiological diseases or clinical diagnoses typically seen by doctors in a first appointment'	Vertigo	Vestibular & balance disorders (acoustic neuroma (vestibular schwannoma); benign paroxysmal positional vertigo; Ménière's disease)
	Infections	Ear (otitis externa; otitis media) Nasal/sinus (rhinosinuitis; peri-orbital & orbital cellulitis) Throat (epiglottitis; tonsillitis; infectious mononucleosis) Other (mumps)
	Other	Endocrine (thyroid disease (including thyrotoxicosis, hypothyroidism, thyroid eye disease & thyroid nodules); parathyroid disease (including hyperparathyroidism & hypoparathyroidism)) Obstructive sleep apnoea
'Practical procedure'	Practical skills	Perform otoscopy Take &/or instruct patients how to take a swab

'Presentations' and 'Conditions' were collated from the UK Medical Licensing Assessment (UKMLA) curriculum, and 'Practical procedures' were collated from the General Medical Council (GMC) Practical Skills and Procedures supplementary curriculum.

relevant literature for other forms of teaching delivery used at medical schools.^{17,18}

Setting

A consensus forum was held at the 2nd East of England ENT Conference, an online conference for medical students and foundation doctors held via Zoom (Zoom Video Communications, San Jose, California, USA) in April 2021. This conference was advertised nationally to medical students and foundation doctors.

Participants

Participants attending the consensus forum contributed anonymously via the live polling website Vevox (Auga Technologies Ltd, UK) to submit votes for demographic information and teaching method polls. Demographic information

Table 2. List of nine teaching methods*

Teaching method type	Teaching method	Definition
Theoretical	Large-group lecture	Didactic teaching delivered to a large group
	Small-group seminar	Teaching delivered to a small group with opportunity for discussion
	Problem-based	Solving real-world problems, often those without a single right answer
	Technology-enhanced	Using technology (e.g. audio, apps) within sessions to assist delivery
	E-learning	Delivering teaching entirely via technology
	Self-directed	Students define the topic & research in ways of their own choosing
	Practical	Small-group practical
Simulation & role-play		Working through real-world scenarios, often taking on a role with views unlike their own &/or investigating using tools & methods as similar as possible to those in the workplace
Work-based/ clinical-based		Experiential learning in wards, clinics etc.

*Based on the Teaching Approaches Menu created by Sheffield Hallam University and on relevant literature for other forms of teaching delivery used at medical schools

included: age category, stage of training, medical school attended and intention of pursuing a career in ENT.

Outcomes

Participants watched an introductory presentation defining the core ENT syllabus content and each teaching method. They were asked to identify teaching methods they had previously experienced. For each item on the core ENT syllabus, participants were asked to select up to three teaching methods they believed were best suited to teaching the item. In order to minimise the impact of technical issues on the live voting session, all polling, including demographic information, was carried out under a time limit for vote submission. Voting for each syllabus item was open for 45 seconds before progressing to the next item.

Results were statistically analysed and plotted using Prism GraphPad 9.0 (GraphPad Software, San Diego, California, USA). For each of 'Presentations', 'Conditions' and 'Practical procedures', a test of proportions was used to identify whether there was a statistically significant difference between the proportions of votes received for each teaching method. An alpha value of less than 0.05 was chosen to indicate significance.

Results and analysis

Demographics

Sixty-four individuals participated in voting, with a median age category of 22–23 years. Fifteen UK medical schools were represented. Participants consisted of 27 students, 11 foundation doctors and 7 other junior doctors. Forty-seven participants

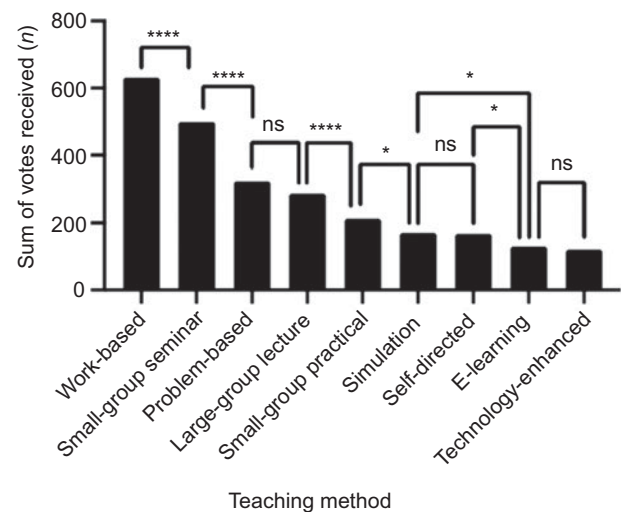


Figure 1. Teaching method preferences for 'Presentations'. Histogram showing the proportions of votes received for each teaching method among the 19 'Presentations' curriculum items. Statistical differences between vote share are illustrated. ns = not significant; * $p < 0.05$; **** $p < 0.0001$

provided a career preference: 20 out of 47 (42.6 per cent) participants intended to pursue ENT as a career, while 4 out of 47 (8.5 per cent) participants did not intend to do so and a further 23 out of 47 (48.9 per cent) participants were unsure.

Previous experience of teaching methods

All teaching methods polled had previously been experienced by a majority of the 43 participants who indicated past experience. The most common teaching methods previously experienced were large-group lectures and work-based or clinical-based teaching, which 39 out of 43 (90.7 per cent) participants who voted had experienced. The least common teaching methods previously experienced were technology-enhanced (28 out of 43, 65.1 per cent) and problem-based (29 out of 43, 67.4 per cent) methods.

Teaching methods selected for 'Presentations'

There was a significant difference in participant preference for different teaching delivery methods, with work-based or clinical-based teaching and small-group seminar receiving significantly higher proportions of votes than other teaching methods ($p < 0.0001$) (Figure 1). The next most selected methods were problem-based and large-group lectures, with no significant difference between these. The remaining five teaching methods (small-group practical, simulation and role-play, self-directed, e-learning, and technology-enhanced methods) received significantly fewer votes ($p < 0.001$).

Teaching methods selected for 'Conditions'

There were significant differences between proportions of votes for different teaching methods within the 'Conditions' curriculum items (Figure 2). Work-based or clinical-based teaching and small-group seminar methods received the highest proportion of votes ($p < 0.0001$), while the least-selected teaching methods were small-group practical, self-directed, technology-enhanced, e-learning and simulation, and role-play methods ($p < 0.01$). Large-group lectures and problem-based teaching were selected significantly less often than the

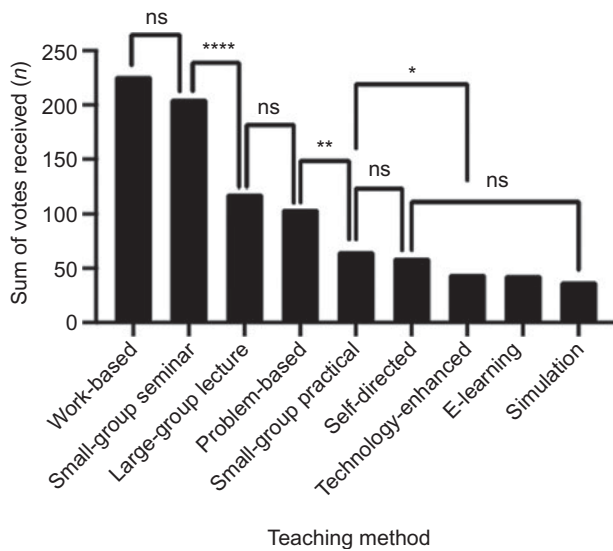


Figure 2. Teaching method preferences for ‘Conditions’. Histogram showing the proportions of votes received for each teaching method among the seven ‘Conditions’ curriculum items. Statistical differences between vote share are illustrated. ns = not significant; **p* < 0.05; ***p* < 0.01; *****p* < 0.0001

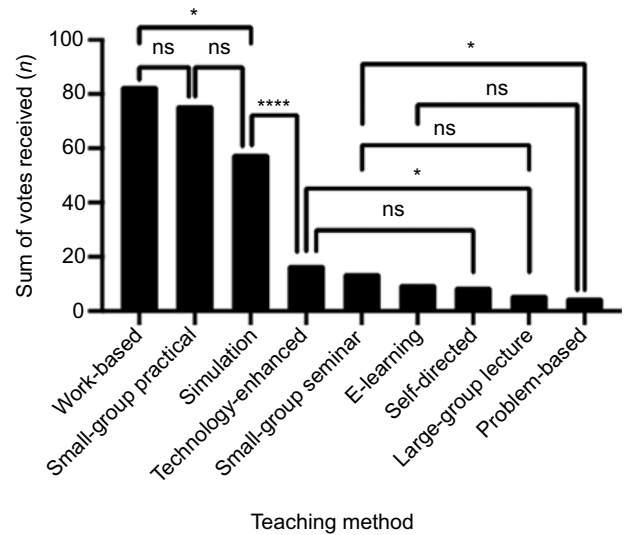


Figure 3. Teaching method preferences for ‘Practical procedures’. Histogram showing proportions of votes received for each teaching method among the two ‘Practical procedures’ curriculum items. Statistical differences between vote share are illustrated. ns = not significant; **p* < 0.05; *****p* < 0.0001

two methods with the highest proportions of votes, but significantly more often than the five methods with the lowest proportions of votes.

Teaching methods selected for ‘Practical procedures’

For ‘Practical’ procedures, the three practical teaching methods (work-based teaching, small-group practicals and simulation) received significantly higher proportions of votes than the six theoretical teaching methods (*p* < 0.0001) (Figure 3).

Table 3 shows a summary of the popularity of teaching methods for each aspect of the core ENT syllabus.

Discussion

There is often significant overlap between presentations and conditions in the UK Medical Licensing Assessment and therefore within the syllabus used here. While these are clearly defined in theory, in practice there is a somewhat arbitrary distinction between learning about, for example, the presentation ‘Dizziness/vertigo’ and the conditions ‘Vestibular and balance disorders’ and ‘Benign paroxysmal positional vertigo’, and so on. This similarity was reflected in the consensus results: participants selected similar preferred teaching methods for presentations and conditions.

With regard to practical procedures, all practical teaching methods (simulation, small-group practicals, and work-based or clinical-based teaching) received significantly higher proportions of votes than theoretical methods. The need to acquire and practice the required motor skills to carry out procedures in a clinical environment is recognised by medical schools, and all currently include procedure training using these methods.

Comparison to other studies

The most selected teaching method through all syllabus items was work-based or clinical-based teaching. This reflects previous evidence regarding Generation Z’s preferences to learn through practical experience with teachers facilitating.^{1,2} Experiential learning is the most common form of teaching delivery in most medical school curricula¹⁸ and shows students how ENT-related care is delivered in practice compared to in theory. However, the ENT placement time provided for most medical students is minimal, meaning students might not have adequate exposure to core ENT syllabus items during clinical placement.

There has been an explosion in e-learning resources and their usage in medical education, both in the UK and worldwide.^{19,20} Early studies suggested students desired more e-learning in ENT.^{13,15} E-learning has unique advantages, including the ability to learn remotely, at convenient times

Table 3. Summary of participant preferences of teaching methods for ‘Presentations’, ‘Conditions’ and ‘Practical procedures’

Popularity	Presentations	Conditions	Practical procedures
Most popular	Small-group seminar Work-based/clinical-based	Small-group seminar Work-based/clinical-based	Simulation & role-play Small-group practical Work-based/clinical-based
Middling popularity	Large-group lecture Problem-based	Large-group lecture Problem-based	
Least popular	Technology-enhanced E-learning Self-directed Small-group practical Simulation & role-play	Technology-enhanced E-learning Self-directed Small-group practical Simulation & role-play	Large-group lecture Small-group seminar Problem-based Technology-enhanced E-learning Self-directed

and at students' own pace, whereas traditional face-to-face teaching is often time- and place-restricted. However, e-learning requires relatively high development and maintenance costs, resulting in significant investment by institutions such as medical schools and national societies to make more resources available online. Contrary to the movement towards e-learning, our consensus event identified that for most core ENT syllabus items (both presentations and conditions), participants preferred traditional teaching methods like small-group seminars to more 'modern' teaching methods such as e-learning and simulation and role-play. These findings are consistent with more recent literature, including a randomised, controlled trial of face-to-face versus synchronous e-learning in ENT emergencies, which found that although there was no difference in student ratings for usefulness, interactivity and meeting educational needs, students receiving face-to-face teaching were more satisfied overall.²¹

There are numerous possible explanations for participants' preferences for traditional clinical-based and small-group teaching over e-learning and technology-based teaching. While the simplest conclusion would be that participants had an inherent preference for more traditional teaching methods, it is also possible that these methods are currently more widely used within medical education, and participants' increased familiarity with them increases the likelihood of selecting them. Similarly, modern methods have only recently become popular, and formal teaching sessions are often designed by senior medical professionals or trainers used to providing traditional forms of teaching. This may have led to participants experiencing e-learning modules and technology-enhanced teaching sessions that were not fully optimised in design, which discouraged them from requesting future teaching in this format. Finally, this consensus forum was conducted in April 2021 after a year of significant disruption to medical education because of the Covid-19 pandemic. Many participants would have received a much higher proportion of teaching via online platforms than under normal circumstances; this may have led to a desire to receive more in-person teaching and experience.

Limitations and strengths

There are numerous strengths to this consensus data. Medical students and foundation doctors are key stakeholders in undergraduate ENT education: while medical students are currently undergoing this training, practising foundation doctors are well-positioned to retrospectively assess what was well taught to them and how teaching could be improved. The clear preferences elicited in this consensus forum are a significant contribution to the limited research currently available in this area. The anonymity of the voting enabled all participants to express their preferences without consequences, enabling honest responses regarding teaching methods which may be difficult for students to provide directly to those delivering undergraduate education.

There are also limitations to these results. The number of items on the syllabus likely created decision fatigue and, as such, the votes for latter syllabus items may be less reliable than those for earlier ones. This was exacerbated by the forum's virtual nature and the timing near the end of the day-long conference. We attempted to counteract these factors by grouping syllabus items together as much as possible. The two practical procedure items were polled at the end of the forum and there was a clear change in preferences for

teaching methods, which suggests participants were still giving reasonable consideration to their voting. The virtual format also presented a significant barrier to discussion following each round of voting. The forum therefore produced only quantitative data without exploring participants' reasoning. A future mixed-methods approach could provide a more in-depth understanding of participants' experiences with various teaching methods and rationale for their choices.

Clinical applicability and generalisability

Absenteeism has previously been identified as a challenge for the already brief ENT placements that medical students receive.¹³ The clear preferences expressed during this forum may assist medical schools in designing learning opportunities their students will take full advantage of.

There clearly remains a role for e-learning to complement other teaching methods. Indeed, a meta-analysis in 2019 found that blended use of e-learning and traditional face-to-face learning for medical education was more effective than traditional teaching alone.²² Trialling different e-learning styles and designs may enable the development of methods better suited to learner needs. This could be aided by mixed-method and qualitative research to learn more about the rationale behind the elicited preferences regarding teaching methods.

It is possible the expressed preferences in methods of teaching delivery may not represent the most effective teaching methods in practice. However, using teaching methods that learners prefer may improve their engagement, which is essential for effective learning, and individual learners are also most likely to know which teaching methods work best for them. Objective assessments of the effectiveness of these different teaching methods are required, which, when paired with learner consensus opinion, will help medical schools to optimise the way ENT is taught to future doctors.

- The UK Medical Licensing Assessment curriculum represents a consensus on core content, but there is no similar consensus regarding how ENT content should be taught at medical school
- An anonymised consensus forum with 64 medical students and junior doctors sought to ascertain how ENT-related topics from UK curricula should be taught at medical school
- For UK Medical Licensing Assessment curriculum items, the most popular teaching methods were clinical experience and small-group seminars
- For General Medical Council practical procedures curriculum items, practical teaching methods (clinical-based/work-based teaching, small-group practical teaching, and simulation and role-play) were most popular
- Use of e-learning and technology-enhanced teaching methods, despite increasing prevalence, were least popular
- Further mixed-method and qualitative research may help explain these preferences and enable medical schools to optimise teaching methods

Conclusion

For the UK Medical Licensing Assessment ENT-related presentations and conditions, the most popular teaching methods were via clinical experience and small-group seminars, and medical schools must recognise the need for sufficiently long ENT placements to facilitate this learning. E-learning and technology-enhanced teaching methods, despite increasing use, were consistently among the least popular teaching methods. Mixed-method and qualitative research to explore the rationale behind the elicited preferences for different teaching

methods and the development of e-learning techniques may enable medical schools to ensure that the teaching they provide better meets learners' needs and expectations.

Competing interest. None declared

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