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Review

Providing national level teaching to OMFS specialty trainees in a virtual classroom setting using learning theories of education

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Abstract

COVID-19 has resulted in an expansion of webinar-based teaching globally. Socially distanced e-learning is the new normal. The delivery of regional OMFS teaching programmes in the UK and the Republic of Ireland, for Specialty Trainees (ST's) under the Joint Committee on Surgical Training (JCST) and Intercollegiate Surgical Curriculum Programme (ISCP) umbrellas is variable. We recognised the need to provide additional teaching to supplement this teaching, at a time of crisis in our countries and healthcare systems, which had jointly led to a significant impact on the progression of training.

The membership category of Specialty Trainees within the national specialty association-the British Association of Oral and Maxillofacial Surgeons (BAOMS) is Fellows in Training abbreviated to FiT.

We designed an OMFS FiT (Fellows in Training) webinar series based on the current Oral and Maxillofacial Surgery (OMFS) curriculum. Senior trainers delivered weekly national web-based teaching using learning theories of education. Thirteen webinars were conducted between the 14th of May and the 4th of August 2020. Webinars were attended by 40–75 ST's with 98 percent of trainees rating the webinars as 'excellent' or 'very good', and 99% found the content 'extremely useful' or 'very useful'. We discuss the learning theories used for this teaching which include – Bloom's taxonomy, Bruner's spiral model, Vygotsky's zone of proximal development, the flipped classroom model, and Knowles' andragogy model. This pilot national teaching programme has been extremely well received by OMFS trainees and is here to stay!

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Introduction

In the last few months, due to the COVID-19 pandemic and social distancing rules, there has been a global explosion of medical education webinars. These webinars have reduced some barriers to learning and allowed clinicians to come

together on virtual platforms to share knowledge. The webinars have been delivered in a variety of ways, with varying degrees of uptake and success.¹

Traditional delivery of OMFS ST formal teaching has involved local and regional face to face sessions with variations between regions, despite an agreed ISCP curriculum. We focussed on the delivery of national teaching for all Oral and Maxillofacial Surgery (OMFS) Specialty Trainees (ST's) using a virtual platform.

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Fig. 1. New logo for the OMFS FiT of BAOMS.

In this paper, we discuss three key aspects of our unique experience, which may be informative for surgical trainers in OMFS and other surgical specialties.

Firstly, we discuss this national teaching programme and how it was delivered. Secondly, we review the teaching provided through the lens of learning theories which can be applied for surgical education. Finally, we share the feedback received.

The OMFS FiT National Teaching Programme

The programme was rolled out by the Fellows-in-Training (FiT) group of the British Association of Oral and Maxillofacial Surgeons (BAOMS) (Fig. 1).

This was a pilot educational webinar series and the topics were sampled from the General Medical Council (GMC)



Fig. 2. Flyer Webinar 10.

OMFS curriculum available on the Intercollegiate Surgical Curriculum Programme (ISCP). Senior trainers and experts in their fields were invited to conduct these teaching sessions. The programme was hosted and organised by one of the post-FRCS trainees.

Thirteen weekly teaching sessions were delivered from the 14th of May 2020 till the 4th of August 2020. Table 1 shows the teaching sessions, dates, topics, trainers, and the number of trainees who attended these webinars.

The programme was delivered virtually using the ZOOM platform. ZOOM Video Communications is a videoconferencing company in San Jose, California.²

A teaching flyer (Fig. 2) was posted in the trainee forum, the OMFS FiT group on Facebook and advertised on the OMFS FiT twitter account.

All NTN holding Fellows in training (ST1-ST7) were invited to register their interest by sending an email to omfs-

Table 1
OMFS FiT national teaching programme.

Webinar number	Date	Topic	Trainer	Number of trainees attended
Webinar 1	14th May 2020	Surgical margins for keratinocyte and non-keratinocyte cancers	Miss Carrie Newlands Consultant OMF surgeon	57
Webinar 2	21st May 2020	Local flaps for reconstruction of skin cancer defects Part 1	Miss Carrie Newlands Consultant OMF Surgeon	58
Webinar 3	28th May 2020	Local flaps for reconstruction of skin cancer defects Part 2	Miss Carrie Newlands Consultant OMF Surgeon	59
Webinar 4	4th June 2020	Facial nerve palsy	Mr Ruben Kannan Consultant Plastic Surgeon	50
Webinar 5	11th June 2020	Tips and tricks and skin grafts	Miss Carrie Newlands Consultant OMF Surgeon	58
Webinar 6	18th June 2020	Orthognathic assessment made simple	Miss Daljit Dhariwal Consultant OMF Surgeon	75
Webinar 7	25th June 2020	Vesiculobullous lesions	Mr Jeremy Collyer Consultant OMF Surgeon	50
Webinar 8	2nd July 2020	Benign skin lesions	Miss Carrie Newlands Consultant OMF Surgeon	58
Webinar 9	9th July 2020	Clinical cases in orthognathic surgery	Miss Daljit Dhariwal Consultant OMF Surgeon	49
Webinar 10	15th July 2020	Non-odontogenic facial pain	Mr Parkash Ramchandani Consultant OMF Surgeon	52
Webinar 11	23rd July 2020	Clinical cases in orthognathic surgery	Miss Daljit Dhariwal Consultant OMF Surgeon	54
Webinar 12	28th July 2020	Dental implantology	Mr Jagtar Dhanda Consultant OMF Surgeon	40
Webinar 13	4th August 2020	FRCS revision planning 'For Trainees by Trainees'	Trainees	59

1. Overall, how would you rate the webinar with Miss Newlands?

☐ Excellent ☐ Fair

☐ Very good ☐ Poor

☐ Good

2. How helpful was the content presented at the webinar?

☐ Extremely helpful ☐ Not so helpful

☐ Very helpful ☐ Not at all helpful

☐ Somewhat helpful

3. Do you have any other comments, questions, concerns or suggestions for improvement?

Fig. 3. Feedback questionnaire.

fit@gmail.com. Pre-webinar documents with clinical images and a ZOOM meeting link were sent to the registered participants.

Between 40 and 75 trainees participated in the webinars, which were held on a weekday evening, lasting from 45 min to an hour. This number of participants (75) represents 52% of the ISCP FiTs as there are approximately 145 numbered OMFS trainees in 2020.^{3,4}

An email with a feedback link for each session was sent to all trainees and those who completed feedback were provided certificates of attendance, with each session representing an hour of Continuing Professional Development (CPD) activity.

The feedback consisted of three simple questions (Fig. 3).

The trainers and trainees were provided certificates. The trainers were also provided feedback received from trainees. The programme was well received by trainees. Most of the webinars were recorded, video-edited and uploaded on a secure website. The links of these webinars were shared with the FiT (Fig. 4).

Application of learning theories in the OMFS Teaching programme

Technology has facilitated the learning experience of these trainees in surgical education, and we feel that the application of established educational learning theories has been pertinent and powerful in stimulating the minds of trainees and making this a successful venture.

Teaching styles vary and every trainer has their own style of teaching. In this section, we discuss the various learning theories that were used for these sessions.

Learning theories used for education

A trainee was involved in choosing topics with trainers. Malcolm Knowles argued that most adult learners want to be in control of their learning and maintained that, as an individual matures, the motivation to learn is driven more by internal motivators (an inner desire) rather than external motivators (external stimuli).⁵ A trainee representative for the learner cohort ensured relevant subject matter was taught. Knowles acknowledged the need to appreciate the vast amount of practical experience adult learners often possessed.^{5,6}

Lesson planning is extremely important. One of the senior trainers planned a teaching session on 'local flap reconstruction of skin defects.' The session was based on the curriculum content for OMFS.⁷ The experienced trainer set the lesson objectives based on Bloom's taxonomy. The participants were informed that: by the end of the session,

- Learners will be able to define local flaps, primary and secondary defects. Bloom's Level 1 (Knowledge);
- Learners will be able to explain local flap design. Bloom's Level 2 (Comprehension);
- Learners will be able to demonstrate local flap design to reconstruct a head and neck skin defect. Bloom's Level 3 (Application);
- Learners will be able to analyse local skin laxity to design a flap. Bloom's Level 4 (Analysis);
- Learners will be able to choose an appropriate flap based on the anatomical location of the head and neck skin defect. Bloom's Level 5 (Synthesis);
- Learners will be able to use the principles of flap design to reconstruct any head and neck skin defect. Bloom's Level 6 (Evaluation).

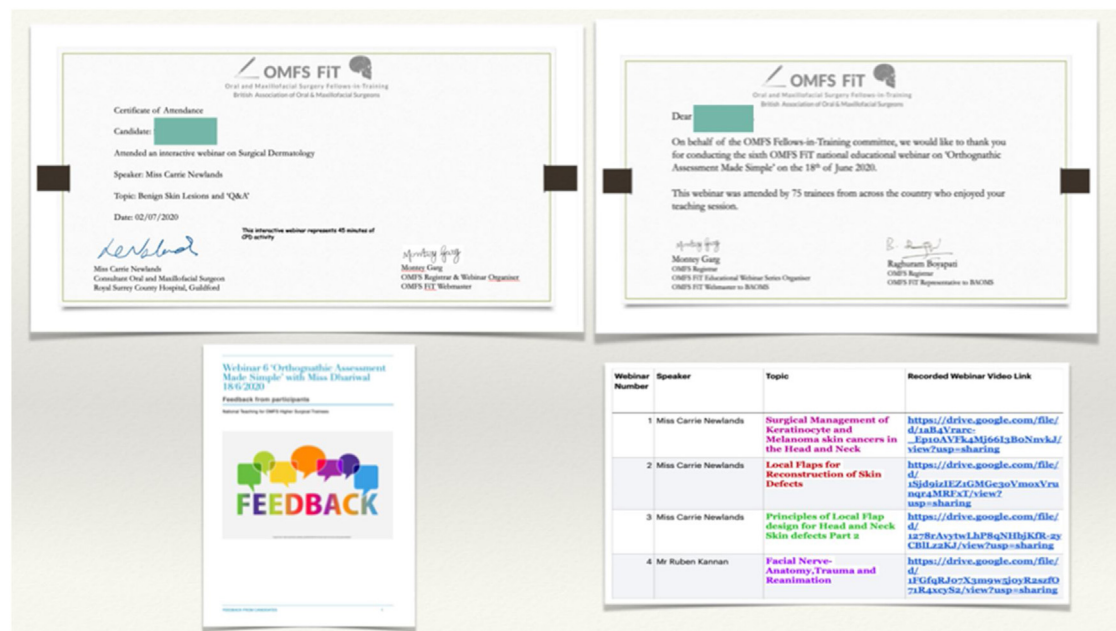


Fig. 4. Candidate, faculty certificates, feedback for trainers and webinar video links.

Bloom's taxonomy contains six categories of cognitive skills as shown in the lesson planning above ranging from lower-order skills that require less cognitive processing to higher-order skills that require a greater degree of cognitive processing.⁸ Such higher-order skills are needed as learners develop into independent surgeons. Trainers can help trainees gain these skills by using this structured approach in their teaching sessions.

Many webinars in the series required trainees to carry out pre-webinar preparation, for which material was supplied. This allowed trainees to learn basic content before the virtual classroom. This 'flipped classroom' model⁹ is known to improve the cognitive load management of students.¹⁰ The four pillars of FLIP are Flexible environments (students choose when and where they want to learn), Learning culture (there is a shift from a teacher-centred classroom to a student-centred approach), Intentional Content (the trainer evaluates what material the trainee should be asked to explore first on their own outside of the group learning space), and a Professional educator (who knows how to maximise the time in the virtual classroom).⁹ The flipped classroom model has shown success in teaching trainees in oral and maxillofacial surgery.^{11–14} One of the trainers conducted three webinars on orthognathic surgery and used Bruner's 'spiralling' concept to encourage trainees to reflect on their understandings and revisit these understandings if needed. The first webinar was on 'orthognathic assessment', in the second webinar, the principles of assessment were revisited in orthognathic planning whilst assessing patient photographs, radiographs, and models. Finally, the same principles were applied in assessing more complex cases in the third webinar. Bruner's spiral curriculum is an approach to education that involves regularly revisiting the same educational topics over the course of a stu-

dent's education and each time the content is re-visited, the student gains a deeper knowledge of the topic. It uses prior knowledge to inform future learning.¹⁵ This concept moves away from the notion of a steady build-up of knowledge.⁵ The trainers conducting the webinars asked 'higher order thinking' questions of participants whilst discussing management options for clinical cases. The participants although muted were encouraged to participate by typing their answers in the chat box. By asking questions, like 'How would you manage this case with an occlusal cant and mandibular asymmetry?' Or 'How would you reconstruct this scalp defect?' the trainers were able to establish the optimal knowledge base of the group of participating trainees. This has been described as Vygotsky's 'zone of proximal development' or ZPD where the trainee group is able to make progress in the presence of a more knowledgeable peer (the trainer) but unable to do so independently.¹⁶ ZPD is the difference between what a learner or a group of learners can do without help and what they can achieve with the help of a skilled partner/trainer. 'Proximal' refers to those skills the learner is 'close' to mastering.¹⁷ These learning theories can be adopted by any skilled senior trainer for teaching trainees and all the theories worked well in our webinar series. The use of the chat box was felt to encourage participation, and overall, there was a high level of engagement by the learners.

Feedback from trainees

Overall 77 percent of the candidates rated these 13 webinars as 'excellent', 21 percent rated these webinars as 'very good' and 2 percent of the candidates rated these webinars as 'good'. Overall 71 percent of the candidates found the content 'extremely useful', 28 percent 'very useful' and only 1

Table 2
Candidate feedback for webinars.

	Topic	Q1 Candidates who rated the webinar 'Excellent'	Q1 Candidates who rated the webinar 'very good'	Q1 Candidates who rated the webinar 'good'	Q2 Candidates who found the webinar content 'extremely useful'	Q2 Candidates who found the webinar content 'very useful'	Q2 Candidates who found the webinar content 'somewhat useful'
Webinar 1	Surgical margins for keratinocyte and non-keratinocyte cancers	87% (39)	13% (6)		56% (25)	44% (20)	
Webinar 2	Local flaps for reconstruction of skin cancer defects part 1	86% (37)	14% (6)		79% (34)	19% (8)	2% (1)
Webinar 3	Local flaps for reconstruction of skin cancer defects part 2	81% (33)	17% (7)	2% (1)	83% (34)	17% (7)	
Webinar 4	Facial nerve palsy	75% (30)	20% (8)	5% (2)	68% (27)	32% (13)	
Webinar 5	Tips and tricks and skin grafts	79% (34)	21% (9)		79% (34)	21% (9)	
Webinar 6	Orthognathic assessment made simple	80% (49)	16% (10)	3% (2)	62% (38)	34% (21)	3% (2)
Webinar 7	Vesiculobullous lesions	65% (28)	35% (15)		63% (27)	33% (14)	5% (2)
Webinar 8	Benign skin lesions	72% (38)	26% (14)	2% (1)	75% (39)	25% (13)	
Webinar 9	Clinical cases in orthognathic surgery	83% (34)	17% (7)		78% (32)	22% (9)	
Webinar 10	Non-odontogenic facial pain	67% (26)	31% (12)	3% (1)	56% (22)	41% (16)	3% (1)
Webinar 11	Clinical cases in orthognathic surgery	83% (30)	17% (6)		83% (30)	17% (6)	
Webinar 12	Dental implantology	72% (23)	25% (8)	3% (1)	62% (20)	38% (12)	
Webinar 13	FRCS revision planning 'for trainees by trainees'	73% (24)	24% (8)	3% (1)	79% (26)	18% (6)	3% (1)

There were many positive free-text responses from trainees some of which are shown in Table 3.

percent 'somewhat useful'. Table 2 shows the responses of the candidates for each webinar.

We also conducted a follow-up survey in January 2021 asking trainees if they'd prefer a working day or evening webinars. We also asked them if there was any regular teaching activity in their region.

In the follow-up survey, 44 STs responded and 92% of the respondents preferred evening webinars and 8% preferred working day webinars. A total of 60% of the respondents had some form of regular webinar teaching in their region.

Discussion

Formal lecture-based teaching has been criticised by many as an ineffective, outdated, and passive form of learning.¹⁸ It can be hard to ensure teaching sessions achieve the intended learning objectives as attendance does not directly translate to learning something new. We have used a virtual online classroom, with interactive teaching based on learning theories of education and collaborative participation from trainees. We chose clinical topics relevant to trainees' surgical practices

and have shown that they found this to be both educational and a popular way to learn.

Providing pre-webinar learning material allowed trainees to engage in the teaching sessions. Appropriate reflection, feedback, and participation certificates completed the learning cycle.

COVID has had a significant impact on operative and clinical experience. In the short term it may be worth persisting with out-of-hours teaching to reduce the conflict between teaching and operating.

Elledge et al¹⁹ had a similar positive experience in their regional teaching using Zoom software with 15 trainees in the West Midlands. Aulakh et al²⁰ showed success using Microsoft teams for virtual journal clubs in Bradford.²⁰ The delivery of regional OMFS teaching programmes for JCST ST's is variable. The OMFS FiT National webinar series is the first formal national teaching programme for ST's. This has been well received by the OMFS Specialty Advisory Committee (SAC) who plan to run this programme in conjunction with the British Association of Oral and Maxillofacial Surgeons (BAOMS). The SACs play a key role in the development and improvement of postgraduate surgical training in the UK and Ireland. Each SAC works to ensure

Table 3

	Topic	Q3 A compilation of a random selection of free-text responses that trainees gave regarding their teaching experience for each webinar
Webinar 1	Surgical margins for keratinocyte and non-keratinocyte cancers	<i>'This was a fantastic session. The focus on diagnosis and margins was a great idea. This meant that more cases were covered thus reinforcing diagnosis and clinical features of the pathology specially for those that don't see much skin.'</i> <i>'The slides given prior to the webinar really helped me prepare my answers.'</i> <i>'Excellent webinar, right pace of presentation, engaging'</i>
Webinar 2	Local flaps for reconstruction of skin cancer defects part 1	<i>'Really helpful, right pace to allow me to think of flaps to use and then comparing it with the option chosen. Also helps fully explain why one flap was chosen compared with others by a very experienced person. This is stuff you don't find in books'</i> <i>'The best webinar I've been to on local flaps. I finally understand why I am doing what I'm doing – thank you'</i>
Webinar 3	Local flaps for reconstruction of skin cancer defects part 2	<i>'Thanks again. You are the only person doing national teaching for OMFS. Other countries have had national programmes for months'</i> <i>'Really excellent presentation. Explained bilobed flap really well'</i> <i>'Another fantastic session, look forward to more teaching webinars'</i>
Webinar 4	Facial nerve palsy	<i>'This was very detailed. I look forward to watching this again a second and third time.'</i> <i>'Very informative and engaging, thoroughly enjoyed'</i> <i>'Excellent and comprehensive, thank you'</i>
Webinar 5	Tips and tricks and skin grafts	<i>'I really appreciate the diagrams, the more the better, I'm a visual learner'</i> <i>'Really useful tips today and in the previous lectures that I have already started to implement in my own practice – thank you.'</i> <i>'Extremely useful tips which you can't really find in textbooks. Much appreciated'</i>
Webinar 6	Orthognathic assessment made simple	<i>'Excellent webinar, really useful to discuss cases and methods of assessment.'</i> <i>'Systematic approach to assessment of the deformity patient. Very clear and concise. Much appreciated.'</i> <i>'This was an amazing webinar! The topic was dealt with in such depth. The clinical cases were great especially the case of bimaxillary retrognathia which is a case I would not have known how to treat'</i>
Webinar 7	Vesiculobullous lesions	<i>'Great session. Hope these webinars continue'</i> <i>'Excellent audience participation'</i> <i>'Comprehensive overview of vesiculobullous conditions relevant to the FRCS examination and clinical practice'</i>
Webinar 8	Benign skin lesions	<i>'Excellent session. Pearls of wisdom from an experienced trainer'</i> <i>'Well delivered, comprehensive webinar series, really useful, many thanks'</i> <i>'Another excellent teaching session. The topics covered were both academically useful but also very practical. Of note, I've started using Ms Newlands' tips for closure of surgical defects already and obtained great results'</i>
Webinar 9	Clinical cases in orthognathic surgery	<i>'Really good to go over simple cases. Reinforced the basics and majority of what we will actually do. I'd like more of this'</i> <i>'Very comprehensive case discussions. Thank you for making time to teach us.'</i> <i>'This was an excellent format with real cases. Both practical and helpful for exams'</i>
Webinar 10	Non-odontogenic facial pain	<i>'Thorough overview of non-odontogenic facial pain with systematic classification and salient distinguishing features'</i> <i>'Outstanding webinar'</i> <i>'I really enjoyed the webinar and the management of Trigeminal neuralgia was so well explained'</i>
Webinar 11	Clinical cases in orthognathic surgery	<i>'Brilliantly helpful! I've adopted her assessment protocol and its helped give me clarity when analysing'</i> <i>'Thank you, really got me thinking about how I think about and plan my cases'</i> <i>'Please can we have more such webinars that are case based – this was super useful'</i>
Webinar 12	Dental implantology	<i>'A good introduction to dental implants for the FRCS'</i> <i>'Great to get the full picture, really comprehensive'</i> <i>'Very informative webinar'</i>
Webinar 13	FRCS revision planning 'for trainees by trainees'	<i>'Really good advice regarding exam. Very well presented and extremely useful. Thank you for organising it.'</i> <i>'Very good series, thank you'</i> <i>'Very informative and helpful'</i>

that training programmes cover all aspects essential to train someone to the level of a Day 1 consultant.

Reissis et al.²¹ have demonstrated similar success with a national educational webinar series in plastic surgery.

The learning theories discussed in our paper highlight the importance of moving away from didactic teaching. The application of learning theories in surgical education enhances the trainee's experience. This is evident from the feedback we received, reflected in changes in practice of some of the learners.

Online learning is not a panacea and a lot of things are lost in the process. For example, interactivity 'off the record' and 'by the water cooler' conversations that are often as valuable as the lectures themselves, if not more so. In addition, issues have been encountered regarding willingness to engage with sessions, use video, etcetra.¹⁴

The advantage of such a national educational series for trainees is to provide a standardised programme which has the ability to map the entire curriculum over a period of time. It also allows trainees from various regions come together on

a common teaching platform and be interactive through the chat box.

Having arranged and delivered the teaching, we learned several things. Firstly, the importance of becoming familiar with the features of the programme we used, prior to the sessions. We also were aware that the interactive nature did not lend itself well to a fixed time slot, and that the end time needed to be flexible. These sessions were delivered outside normal working hours, which is not consistent with a healthy work-life balance.

However, as part of this paper, we conducted a follow-up survey recently where 92% of trainees have chosen evening webinars over working day webinars.

A total of 60% of trainees also had local teaching webinar activity in their region. Locally provided teaching webinars have the advantage of trainers and trainees knowing each other, which allows more probing questions which might not be comfortable in a national event. These can be case based discussions presented by a trainee. It is likely these will continue (Table 3).

National webinars are clearly different. There's a need to standardise learning for STs and deliver the curriculum nationally in addition to local teaching. Our webinar recordings are available for trainees to revisit their topics of interest. The sessions also provided CPD activity to trainees including certificates which could be uploaded to their ISCP as evidence. The trainers also received certificates including feedback from trainees.

The administrative time (up to eight hours per week) included time to design flyers, reply to emails, make certificates, collate feedback, and edit and upload videos to a secure website.

Future plans include the input of a designated administrator under the umbrella of BAOMS with expert input from the OMFS Specialty Advisory Committee (SAC). The way forward is expanding the faculty and tracking the curriculum in its entirety.

We hope that our experience will inspire more trainers to join this collaborative effort of enhancing teaching for Fellows-in-Training of BAOMS.

Conflict of interest

We have no conflicts of interest.

Ethics statement/confirmation of patient permission

Not required.

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