Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

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Maintaining education and professional development for anaesthesia trainees during the COVID-19 pandemic: the Self-isolAting Virtual Education (SAVEd) project

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Keywords: COVID-19; distance learning; educational technology; graduate medical education; self-isolating; social media

Editor—In early 2020, anaesthetists across the world adopted frontline roles in the fight against coronavirus disease 2019 (COVID-19).[1] However, those who were deemed vulnerable to the complications of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection were asked to 'shield' and so self-isolated at home to avoid exposure.[2] Likewise, those who tested positive for SARS-CoV-2 or whose household members had experienced symptoms were asked to self-isolate. Many of these colleagues began to work from home, a challenge considering the 'hands-on' nature of anaesthesia.[3] Motivated by a wish to make a meaningful contribution during the pandemic, and in response to the ongoing educational need despite the postponement of face-to-face tutorials, the Self-isolAting Virtual Education (SAVEd) project was created by self-isolating trainees based in the North West School of Anaesthesia, UK. In this report, we describe the design of this online educational intervention, and present its impact in terms of uptake and educational evaluation. The Health Education England Research Governance Group granted permission to collect and present this data (date of approval: May 19, 2020).

Based on the Royal College of Anaesthetists' training curriculum, with a focus on preparation for examinations, self-isolating trainees designed and hosted a combination of pre-recorded and live online tutorials. These were delivered using a combination of videoconferencing (Zoom Version 5.0.2; Zoom Video Communications Inc., San Jose, CA, USA) and video-sharing (Vimeo Pro; Vimeo Inc., New York, NY, USA). At the time of writing, 24 live tutorials and two live study days had been delivered, and more than 80 pre-recorded tutorials had been made available through the North West School of Anaesthesia website (www.mmacc.uk). The tutorials were predominantly delivered by trainees, with some taught by consultants; topics were appropriately matched to clinical experience and expertise. All recorded tutorials were peer-reviewed by a senior trainee or a consultant before being published online. The resources were promoted through existing trainee e-mail contact lists, social media, and by sharing resources with other deaneries.

We were able to quantify the reach of SAVEd using social media platform analytics and website metrics.[4] Between March 27 and June 27, 2020, we recorded 4881 visits to the www.mmacc.uk website; the video tutorials received 8304 impressions (number of times the video web page was visited) and 3720 views (number of times the video was played) (Fig. 1). Content was accessed from 50 cities within the UK and 27 countries outside the UK. By June 27, 2020, the @SAVEd_anaes Twitter account, which was established on April 8, recorded ~54 000 impressions, 1528 profile visits, 270 followers, 245 retweets, 382 likes, 763 link clicks, and a 6.6% engagement rate.

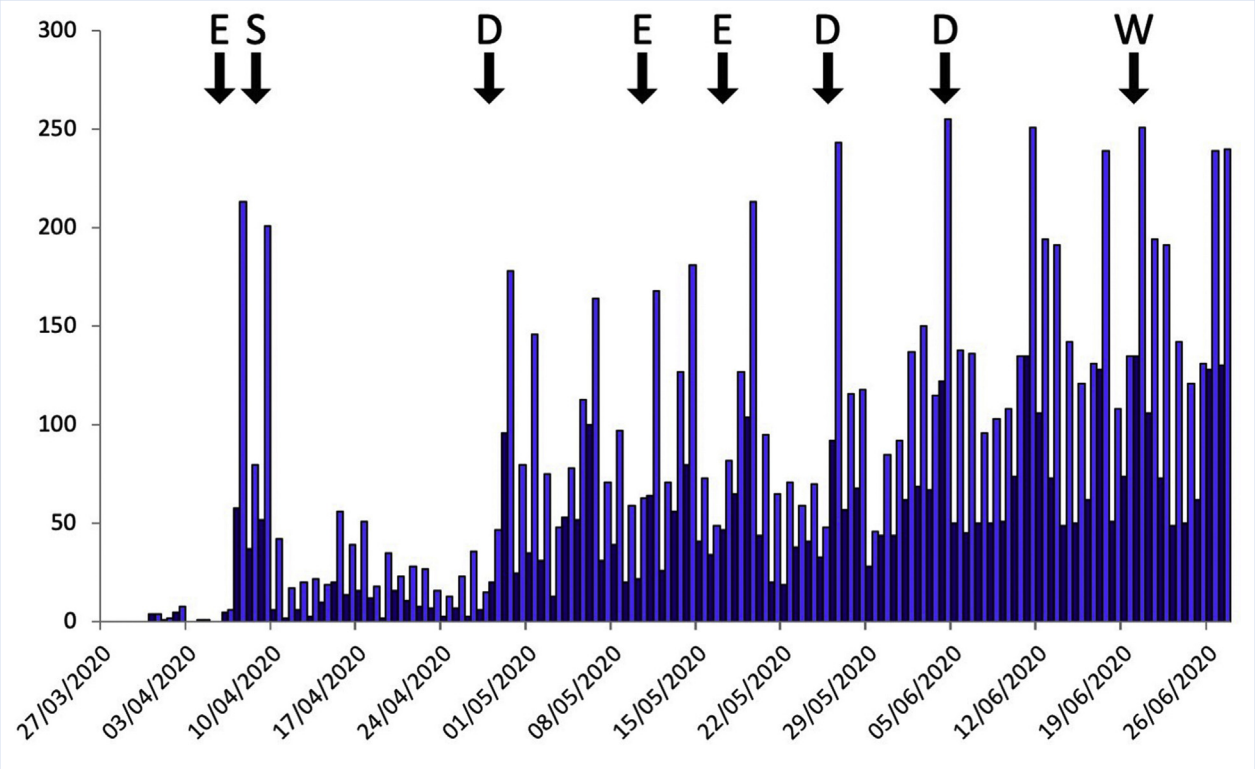

Fig 1. Daily impressions (light blue) and views (dark blue) of SAVEd video resources on Vimeo, and the timing of promotional interventions between March 27 and June 27, 2020. E, e-mails; S, social media accounts opened; D, resources shared with other deaneries; W, national webinar.

The use of e-mail and social media appeared to have an important impact in stimulating engagement with the project. There has been an increasing trend in the number of impressions and views of the tutorials over time with 'spikes' after interventions such as reminder e-mails, the opening of Twitter and Facebook accounts, and the participation of one of the SAVEd faculty as a panellist in a national webinar.[5] Likewise, an increase in engagement was seen after sharing of the resources with other deaneries (Fig. 1).

We assessed the educational impact of the SAVEd project using post-tutorial feedback and, at the preference of the presenter in some live tutorials (n=3), pre- and post-tutorial multiple choice questions (MCQs) administered using the polling function. Attendees rated the resources using 5-point Likert scales and optionally, free-text feedback. We received 456 completed feedback forms which showed median (interquartile range) scores for quality of content, presentation of material and usefulness compared with traditional tutorials of 5 (5–5), 5 (4–5) and 5 (4–5), respectively. MCQ scores were higher post-tutorial than pre-tutorial in the three tutorials where they were used (mean improvement of 24%, 22%, and 32%). Free-text feedback highlighted benefits including less time spent travelling and the ability to access learning more flexibly. Disadvantages included the loss of social contact between trainees that might normally occur during the breaktimes of face-to-face tutorials,[6] and less interaction between attendees and facilitators. Social isolation has a role in physician burnout,[7] a relevant problem during the COVID-19 pandemic. We therefore attempted to facilitate social support by continuing the session after the facilitator left so that attendees were able to engage in informal conversation. The addition of live MCQ polls and the use of pre-tutorial materials notably enhanced attendee–facilitator interaction. Anecdotally, interaction has also improved over time as users have become more at ease with the technology.

Trainees were allocated time away from clinical work to attend live tutorials; therefore, attendance was expected. Nevertheless, more people attended live virtual sessions than would normally be expected for face-to-face tutorials. These were also found to be more reliable as there were fewer cancellations by facilitators owing to clinical commitments. Accessing the pre-recorded online tutorials was entirely optional and therefore dependant on trainee self-direction. Although a small incentive in the form of continuing professional development (CPD) points was available for attending tutorials, this is unlikely to have had a major impact on uptake; previous work has found that the motivation to engage with online learning is predominantly influenced not by external factors but by interest, control, and freedom of choice,[8] all of which are features of the approach we adopted.

The SAVEd project has given self-isolating trainees the ability to work from home to create online tutorials that have been well received and widely utilised by colleagues in the North West School of Anaesthesia and beyond. Social media and online sharing have been instrumental in promoting the uptake of these resources. Although we are keen that face-to-face tutorials should restart when possible, the success of this project has provided a new vision for anaesthetic training in

the North West. We envisage an increasing role for online education to supplement traditional teaching allowing for greater flexibility and hopefully increased engagement. In this new era of free access to online medical resources and technology-enhanced learning,[9,10] we are confident that our resource and others like it will continue to grow and make a substantial contribution to anaesthetic training in the UK and around the world.

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Declarations of interest

CS is a former member of the editorial board of *BJA Education*. The other authors declare no other competing interests.

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Bedside monitoring of lung perfusion by electrical impedance tomography in the time of COVID-19

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Keywords: COVID-19; electrical impedance tomography; lung perfusion; mechanical ventilation; pulmonary embolism; ventilation/perfusion matching

Editor—Coronavirus disease 2019 (COVID-19) results in a broad spectrum of clinical presentations, including viral pneumonia and acute respiratory distress syndrome (ARDS).[1] Increasingly compelling evidence suggests that the underlying pathophysiology of severe COVID-19 pneumonia is microvascular thrombosis.[2,3] Although the pulmonary vasculature can be seen in exquisite detail with computed tomography pulmonary angiography (CTPA), routine CTPA is neither feasible nor recommended in COVID-19 patients.[4] Therefore, tools enabling bedside evaluation of lung perfusion, including monitoring the response to therapeutic