

# Improving staff confidence and morale through rapid, structured trust-wide technology-enhanced training in the use of COVID-19 personal protective equipment at Oxford University Hospitals

James Sang Woo Hong <sup>1</sup>, Kritica Dwivedi <sup>2</sup>, Bronwyn Gavine <sup>3</sup>,  
Naresh Rughooputh,<sup>4</sup> Angeline Lee <sup>4</sup>, Claudia Salvagno <sup>5</sup>, Helen Higham <sup>3,4</sup>

<sup>1</sup>Department of Cardiology, John Radcliffe Hospital, Oxford University Hospitals NHS Foundation Trust, Oxford, UK  
<sup>2</sup>Oxford Transplant Centre, Churchill Hospital, Oxford University Hospitals NHS Foundation Trust, Oxford, UK  
<sup>3</sup>Nuffield Department of Clinical Neurosciences, University of Oxford, Oxford, UK  
<sup>4</sup>Nuffield Department of Anaesthesia, John Radcliffe Hospital, Oxford University Hospitals NHS Foundation Trust, Oxford, UK  
<sup>5</sup>Infection Prevention and Control, John Radcliffe Hospital, Oxford University Hospitals NHS Foundation Trust, Oxford, UK

## Correspondence to

Dr James Sang Woo Hong, John Radcliffe Hospital, Oxford University Hospitals NHS Foundation Trust, Oxford OX3 9DU, United Kingdom; james.hong.11@alumni.ucl.ac.uk

Received 13 June 2020  
Accepted 26 June 2020  
Published Online First 14 July 2020

Dear editor

As the case numbers of COVID-19 were on the rise in the UK, Li *et al*'s article<sup>1</sup> served as a timely guide to mounting and adapting our own education and training response at Oxford University Hospitals NHS Foundation Trust (OUHT). They highlighted the importance of simulation and technology-enhanced learning (TEL) in delivering essential training, for example, in the use of personal protective equipment (PPE) to enhance the safety of patients while providing a safe environment for healthcare workers (HCWs). Reflecting on our recent experience, we respond largely in agreement with Li *et al*<sup>1</sup> regarding challenges in TEL implementation, along with problems applicable to the field of TEL as a whole.

Starting 23 March 2020, the Oxford Simulation, Teaching and Research (OxSTAR) team at OUHT rapidly designed and deployed structured Trust-wide training and education programmes in areas of critical importance: PPE, skills training (for intubation and proning teams) and intensive care unit induction. The aim was to develop a multimodal training approach, supplemented with simulation and TEL, to address uncertainty over COVID-related best practice and concerns regarding safety. Here, we will focus on reporting our experience of using online learning during the pandemic, as guided by the salient points discussed by Li *et al*.

In developing a webinar, our key areas of focus were

1. Learning engagement and real-time feedback.
2. High-quality delivery of online learning.
3. Efficiency—prudent and efficient use of training resources and faculty, time-efficient delivery and opportunity for self-paced learning.
4. Safety of participants (e.g. ensuring social distancing).
5. Multidisciplinary support from management and relevant departments.

Our aims were to

1. Provide up-to-date guidance on PPE.
2. Increase confidence in the use of PPE.
3. Provide expert responses to participants' questions.

We designed and delivered webinars which were open to all staff. The content included the latest PPE guidelines, where to access resources and how to escalate concerns. In order to ensure learner engagement and real-time feedback, videos demonstrating

donning and doffing of PPE and a live question-and-answer session were included. This enabled engagement with over 100 attendees in real time while following social-distancing measures.

Course delivery quality was a key consideration: several platforms were trialled; a high-quality microphone was used to improve sound quality; and a quiet area was identified to record the webinar from. Additionally, we wrote a 'how to' manual so that all teaching staff would be able to use the same webinar platform in the future. The webinar was recorded and posted on an outward facing site to support self-paced learning and revision.

Data from one of two trust-wide PPE webinars were analysed for quality control purposes (figure 1). A total of 118 people attended, the majority of whom were doctors (52%) ranging from foundation year to consultant level. Nurses, allied health professionals and administrative staff were also in attendance (figure 1B). Staff from all four OUHT hospitals were in attendance. Our webinar reached multiple specialties (figure 1A), with greatest representation from medicine (31%) and surgery (21%).

Immediate feedback through prewebinar and post-webinar questions was gathered (figure 1C). This aimed to assess the impact of the webinar on staff anxiety, confidence in accessing up-to-date resources, and escalating concerns. Staff scored their anxiety or confidence on a 1–10 Likert scale. We saw a mean decrease of 23% in staff anxiety and an increase of 43% in confidence in accessing information. Staff confidence in escalating concerns increased by 48%. On average, staff found the webinar very useful ( $8.5 \pm 2.06$ ) and highly recommended it as a format for future updates ( $8.63 \pm 1.99$ ).

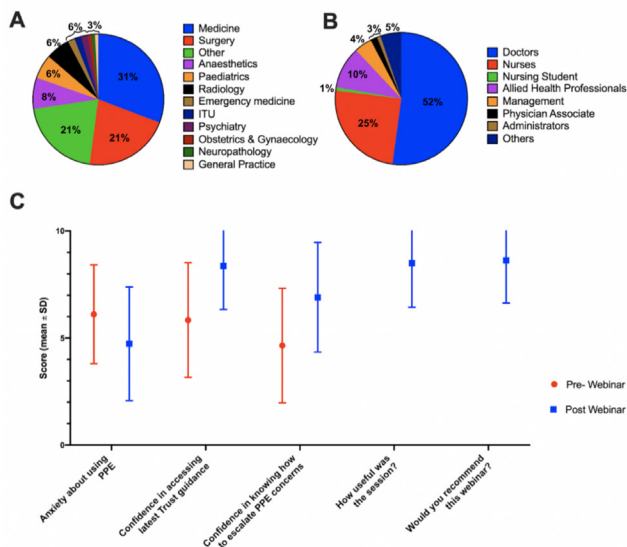
While this is a limited survey, these findings demonstrate that the use of webinars to supplement PPE training improved staff morale, increased confidence in safe use of PPE and decreased the anxiety of webinar attendees. Additionally, it met our criteria for engagement, quality, efficiency and safety.

Our results are consistent with reports that nearly all modes of TEL, as a supplement to traditional methods, improve clinician knowledge, skills and behaviours.<sup>2</sup> However, certain challenges of online learning, such as monitoring the progress of the trainee,<sup>1</sup> remain. This is compounded by uncertainty regarding the most effective methods of TEL delivery and evaluation in healthcare.<sup>3</sup>



© Author(s) (or their employer(s)) 2021. No commercial re-use. See rights and permissions. Published by BMJ.

**To cite:** Hong JSW, Dwivedi K, Gavine B, *et al*. *BMJ Simul Technol Enhanc Learn* 2021;**7**:181–182.



**Figure 1** (A) Distribution of webinar attendees by specialty, (B) Distribution by profession, (C) Pre- and post-webinar feedback.

We acknowledge the limitations in the use of webinars in clinical training. They require users to interact online and thus are prone to technical and accessibility challenges. Content must be meticulously checked, regularly updated and agreed on by all stakeholders, else it will become obsolete. One way we addressed this challenge was to empower staff to access trust-specific resources to keep up-to-date. These were made available on an outward facing easily accessible website managed by OxSTaR (<https://www.oxstar.ox.ac.uk/covid-19>).

Our webinar was designed to be part of a multimodal approach and does not replace face-to-face practical training. Our aim was to supplement in-person PPE training sessions and to provide the latest PPE guidance for the large number of HCWs requiring it, while maintaining social distancing and conserving training and clinical resources.

Simulation centres are well versed in deploying innovative medical education and training through remote learning platforms and high-fidelity simulations. In the current challenging work environment, the ability to deliver swift educational interventions and timely multidisciplinary upskilling in PPE and other skills has been vital.

It is likely that one of the significant collateral benefits of the current extraordinary circumstances will be an extended role for technology in medical training and education. Training in clinical areas in a traditional format, for now, is not feasible, yet staff still require training before they reach the bedside. The use of technology to support learning at a distance or in virtual environments

has played a vital role in supporting healthcare professionals during this pandemic and should continue to do so afterwards. In agreement with Li and colleagues,<sup>1</sup> our experience confirms the importance of quality checking, organisational collaboration and shared learning. Further research into effective methods of delivery and evaluation of TEL would benefit both workers who deliver care and patients who receive it.

**Twitter** James Sang Woo Hong @jsw\_hong, Bronwyn Gavine @BronwynGavine, Angeline Lee @ng10g, Claudia Salvagno @claudiasalvagno and Helen Higham @HelenEHigham

**Acknowledgements** The authors would like to thank the Oxford Simulation, Teaching and Research team, OUH Infection Prevention and Control, and the department of medical education in the Oxford University Hospitals NHS Foundation Trust.

**Contributors** JSWH conceived the work, collected the data, and drafted and revised the manuscript. He is the guarantor. KD conceived the work, analysed the data, and drafted and revised the manuscript. BG conceived the work, analysed the data and revised the manuscript. NR helped conceive the strategic direction of the work and revised the manuscript. AL helped conceive the strategic direction of the work and revised the manuscript. CS contributed to the design of the work and revision of the manuscript. HH contributed to conception, design and revision of the manuscript. All authors have given final approval of the manuscript and agreement for all aspects of the work.

**Funding** The authors have not declared a specific grant for this research from any funding agency in the public, commercial or not-for-profit sectors.

**Competing interests** None declared.

**Patient consent for publication** Not required.

**Ethics approval** The study was reviewed by the clinical trials and research governance team and deemed not to require further ethical approval.

**Provenance and peer review** Not commissioned; internally peer reviewed.

This article is made freely available for use in accordance with BMJ's website terms and conditions for the duration of the covid-19 pandemic or until otherwise determined by BMJ. You may use, download and print the article for any lawful, non-commercial purpose (including text and data mining) provided that all copyright notices and trade marks are retained.

#### ORCID iDs

James Sang Woo Hong <http://orcid.org/0000-0001-8864-6292>

Kritica Dwivedi <http://orcid.org/0000-0003-0915-7250>

Bronwyn Gavine <http://orcid.org/0000-0002-8293-9024>

Angeline Lee <http://orcid.org/0000-0001-6068-2689>

Claudia Salvagno <http://orcid.org/0000-0002-0801-7419>

Helen Higham <http://orcid.org/0000-0001-5796-0377>

#### REFERENCES

- Li L, Lin M, Wang X, et al. Preparing and responding to 2019 novel coronavirus with simulation and technology-enhanced learning for healthcare professionals: challenges and opportunities in China. *BMJ Simul Technol Enhanc Learn* 2020;6:196–8.
- Cook DA, Hatala R, Brydges R, et al. Technology-enhanced simulation for health professions education: a systematic review and meta-analysis. *JAMA* 2011;306:978–88.
- Nicoll P, MacRury S, van Woerden HC, et al. Evaluation of Technology-Enhanced learning programs for health care professionals: systematic review. *J Med Internet Res* 2018;20:e131.