



# The growth of online surgical education

## Can it ever be a substitute for hands-on experience?

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**A**n increasing amount of surgical education is becoming available online in blended and standalone formats. But is this a positive move? And what will the future look like for online surgical learning?

Perhaps the most striking example of blended surgical education – where online and face-to-face teaching are combined – is the forthcoming change to the widely used *ATLS* training course.

Edition 10 of *ATLS (Advanced Trauma Life Support)* is due to be fully rolled out in the UK from June 2018. In the new hybrid course, the face-to-face part has been reduced from three days to two, with

some of the time formerly spent in lectures giving way to more interactive activity, including e-learning. Meanwhile, the hefty *ATLS* manual is being replaced with an online version.

The change to *ATLS* is being reflected in a rising number of surgical education courses – provided by the RCS and externally – that are using online material to supplement or partly replace face-to-face learning.

Online surgical education in a standalone format is also a growth area. This covers a range of material from static text, diagrams and photographs to videos and live content – including operations and webinars, which

give the learner the opportunity to participate in real time.

RCS Education has recently launched the Postgraduate Certificate in Surgery, an online form of learning designed to complement the knowledge and skills that trainees are gaining in the workplace. The certificate – aimed at those in Foundation and Core Surgical Training – currently has 10 modules, which combine interactive learning and assessment and earn learners up to a total of 60 credits for a certificate at postgraduate level. The standard enrolment fee for the certificate is £400 (RCS members have a 10% discount).

The quality assurance and accreditation of online surgical education is an expanding area of the RCS' work. For example, in April 2017 the RCS accredited Incision, an online platform with more than 200 step-by-step procedures using 3D simulation filming and a 3D anatomical model. And in July 2017 the RCS accredited OrthOracle, which is an online orthopaedic surgery platform for Continuing Professional Development (CPD) that provides stepwise overviews of operations by using still photographs accompanied with text and CPD assessment activities.

One reason for the growth in online learning is that it can fit in with trainees' other activities. Nish Srikandarajah, Director of Education at the Association of Surgeons in Training (ASiT), says it gives the flexibility to complete course material when it is convenient for the student. 'It can be undertaken alongside a clinical job without taking time out of a programme to complete a degree.'

For Adam Williams, consultant neurosurgeon and immediate Past President of ASiT, there are a number of advantages of online learning. 'It appeals to the modern generation of trainee surgeons, who are far more *au fait* with e-learning than their predecessors, and it is more akin to our normal methods of research and learning. Many now will read online journals rather than paper-based journals. It circumvents geographical constraints and is scaleable, providing high-quality training to massive

audiences. Its scalability also allows it to be more cost-effective than more classical methods of teaching. It is accessible, allowing trainees who may be on shift rota trying to revise for exams to learn what they want, when they want. Finally, it is self-paced, with flexibility in learning style, and allows continuous updating. Many systems allow for metric analysis and useful, timely and continuous feedback for learners.'

In blended learning, using online content to reduce the amount of face-to-face time given to lectures can free up more time for hands-on learning, interaction between faculty and participants, and discussion. One of the most frequent criticisms of surgical education short courses is that there is not

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enough time allocated for hands-on learning. Greater use of online material – before, during and after the face-to-face part of the course – provides an excellent opportunity for enhancing hands-on skills through courses. Sal Nazir, Head of Quality Assurance and Accreditation at the RCS, says: 'Training time is more precious than ever. E-learning can

help increase the use of time... for practical skills training.'

Consultant orthopaedic foot and ankle surgeon Mark Herron, Managing Editor of OrthOracle, says a lot more online material is now being produced. 'Whatever the online medium is used for, it has the shared advantages of ease and immediacy of access, potentially limitless volumes of information and high-quality graphics and footage, which are particularly advantageous in surgical education. Books, despite their various strengths, are inadequate in how they are able to relay this information – in particular, when compared with what can be done using the online medium.'

Charles Pallandt, Chief Commercial Officer at Incision, says: 'Online surgical education allows surgical professionals to learn from watching footage of qualified professionals performing procedures... It can be accessed globally at any time, which supports the sharing of the best surgical knowledge and skills worldwide. It allows for education sessions in groups, whereby all elements of the surgical procedures can be discussed, at the ideal pace.'

Online learning can benefit patients, as well as surgeons. Mark Herron says: 'The fact that surgical information can be available simply from a computer terminal, now commonplace throughout hospitals and operating theatres, also provides huge





potential benefits in terms of patients' safety and patient outcomes. This must be especially relevant for those who are charged with delivering care independently during the course of their surgical training.'

But are there any disadvantages of online learning? It can probably never replace the value of performing operations in theatre. Pallandt says: 'Online learning – certainly through watching films of procedures, accompanied by the relevant anatomy, tricks and hazards – is of high value to learn the standardised procedure. However, it cannot offer the needed case-by-case surgical decision-making as there might be anatomical variations and distortion of anatomy caused by disease (for example, a tumour), stress management or the finer points of the operation.'

Herron adds: 'Despite the clearer and more comprehensive operative steps that can be published online for surgical readers, it is important for them to appreciate that this is only one aspect of becoming competent. The enhanced levels of information should not be seen as a substitute for carefully structured and supervised training.'

Another problem is that it can be difficult to be sure of the quality of the material being offered via the internet compared with a book or a face-to-face course from a recognised provider. Pallandt says: 'For most surgeons and residents, e-learning is rela-

tively new and it isn't easy to know if online material is of proper-quality level, whereby surgeries are performed according to international standards and guidelines. Creating a professional online surgical learning platform is expensive and requires a high level of dedication and time. Unfortunately, not all learning platforms offer material of the right quality level. Therefore the need arises for identifying trustworthy online educational platforms.'

For trainees, cost can be an issue. Sri-kandarajah complains of the high fee levels associated with registering for the courses, which is not subsidised by the deanery. An issue with some standalone online provision is the lack of personal feedback for the learner. Williams adds: 'Loss of face-to-face contact means you don't have that personal connection with a teacher in the room, theatre or sim suite. And less peer-reviewed material means it is harder to ensure high-quality and accurate content.'

And then there are the technical problems and glitches that can hamper internet-based learning, including compatibility of the user's equipment with the online material, whether the material can get past any internet security firewalls at the user's place of work – and other issues, such as the online video freezing (as happened when I tried to access free-to-view material on Incision).

Ways can be found around some of these shortcomings. The capacity for online learning to interact with the learner on his or her performance, and to provide assessment feedback, is developing. Pallandt says: 'The ability of online resources to provide immediate feedback to users on their performance and to deliver information in ever-more engaging and innovative ways, as well as the ability to detail and disseminate immediately worthwhile innovations or safety issues, are also significant advantages with which the printed medium cannot compete.'

Accreditation by a trustworthy organisation – such as a Royal College – can be one method of identifying online learning material of an acceptable standard. RCS accreditation of Incision and OrthOracle included review by senior surgeons from the appropriate specialty of a sample of the modules being offered, and an iterative process with the provider whereby reviewers' comments lead to improvements, enabling the material to achieve the required standard.

Greater collaboration among online providers and participants would be beneficial, says Sri-kandarajah: 'There is no point there being 50 online medical education courses. Why not synthesise expertise and run a more efficient single course shared and validated between institutions?' More involvement with elected trainee organisations to find out

what is required from trainees would also be a step forward, he says.

And what does the future hold? The likelihood is that online learning will become more interactive, hands-on and realistic. For Srikandarajah, this includes live operations that you can register to view and discuss with the operating surgeon while they are performing.

Williams foresees more widespread mobile learning, with the development of content that is highly interactive but accessible on mobile phones – as well as gamification, with helpful and positive feedback on one’s own performance and, more controversially, to allow competition between learners. He also thinks there will be a reduction in the current number of providers, and the crystallisation of a few massive providers offering high-quality platforms and content.

Pallandt says: ‘Computer-based training in technical skills has the potential to solve

many of the educational, economic, ethical, and patient safety issues related to surgical learning. Virtual reality and augmented reality are developing quickly, making these technologies powerful applications in the surgery field and making it possible to perform surgeries in a virtual operating theatre. Although these technological advances are exciting, it is also important for educators to track the progress of their residents.’

His view is echoed by Herron. ‘The “holy grail” of digital surgical education, whether online or offline, is producing simulation models that are fit for purpose. The current offerings fall far short of what is required but are certainly a starting point. A combination of high-quality procedural information, the development of appropriate training interfaces and ever-improving graphics (combined, of course, with a huge amount of investment) will be the way forward.’

## Online surgical education links



### ATLS Hybrid course

<https://www.rcseng.ac.uk/education-and-exams/courses/search/hybrid-matls-10th-edition-course/>

### RCS Postgraduate Certificate in Surgery

<https://www.rcseng.ac.uk/education-and-exams/courses/postgraduate-certificate-in-surgery/>

### OrthOracle

<https://www.orthoracle.com/>

### Incision

<https://www.incision.care/>

# the funky professor



**The Funky Professor** is a fantastic video anatomy resource, perfect for trainees, medical students, and anyone with an anatomy exam approaching.

available now at:

<http://publishing.rcseng.ac.uk/funkyprofessor>

