

ORIGINAL ARTICLE

YouTube as an educational tool: the launch of a simulated surgical procedures channel

Marina Yiasemidou,^{a,b,*} Andrew Kordowicz,^a Jonathan de Siqueira^a and Michael J. Gough^a

^aSchool of Surgery, Health Education Yorkshire and the Humber, Leeds, UK; ^bLeeds Institute of Biomedical and Clinical Sciences, University of Leeds, Leeds, UK

*Corresponding author at: 7.26 Clinical Science Building, St. James University Hospital, Beckett Street, Leeds LS9 7TF, UK.
Email: marinayiasemidou@gmail.com

Date accepted for publication: 22 February 2019

Abstract

Background: Electronic audiovisual materials have the potential to revolutionize surgical training. The widespread use of social media has made this medium more accessible to surgical trainees. The success of online resources is measured with quantitative measures such as viewer numbers, which do not necessarily reflect the quality of the didactic tools provided. The aim of this study is to assess face and content validity of YouTube as a free multimedia channel for surgical education. **Methods:** In 2014, Yorkshire and the Humber School of Surgery launched a YouTube educational channel aimed at providing additional multimedia training experience to core surgical trainees and anyone else who wishes to use it globally. At the time this study was conducted, the channel included 14 videos of simulated procedures and each video was linked to an online survey. **Results:** At the time this study was conducted, 53 viewers had answered an online survey, which was voluntary. Forty-three of the 53 responders found the uploaded videos relevant to their educational needs and 47 assessed the quality of the videos as good. The length and commentary of the videos received praise. Interestingly, the responders considered e-learning resources to be as vital as courses and books. The viewers would like to see more real procedures in future e-learning outlets. **Conclusion:** The YouTube channel showed good face and content validity, and viewers demonstrated good acceptance of online didactic videos. The authors suggest that the quality of online resources should be assessed with similar tools, as viewership may not necessarily reflect the value of the resources.

Keywords: *technology enhanced learning; multimedia; online teaching*

Introduction

Audiovisual technology is widely used in surgical education.^{1,2} Before the widespread use of social media, such materials were available on commercial bases only. Subsequently, YouTube has provided a medium for unlimited, free access to educational videos.² The success of such online resources is measured with quantitative measures such as viewership numbers, which do not necessarily reflect the quality of the didactic tools provided. The aim of this study is to assess the face and content validity of YouTube as a free multimedia channel for surgical education.

Methods

In 2014, Yorkshire and the Humber School of Surgery launched a YouTube educational channel aimed at providing additional multimedia training experience to core

surgical trainees and anyone else who wishes to use it globally.³ The channel included 14 videos of simulated procedures (Table 1) aimed at core surgical trainees.



Data collection

Each simulated video is linked to an online survey, and the viewers were requested to give feedback by answering a short survey (<https://www.surveymonkey.com/s/Y7H2YJV>). The survey was designed by a Leadership and Management Fellow in surgical education to gauge the perception of viewers about simulation and e-learning overall and to assess the quality and usefulness of the videos.

Results

At the time this study was carried out, the channel had already been launched for 2 years and had 3002 subscribers

Table 1. The videos available on the Yorkshire and the Humber School of Surgery YouTube channel

Procedure	Image	Procedure	Image
Tracheostomy	 https://www.youtube.com/watch?v=53_3OC4axAs	Knot tying	 https://www.youtube.com/watch?v=4dlbRzxorFQ
Subcuticular suturing	 https://www.youtube.com/watch?v=fUZ5FPo1snA	Colostomy and ileostomy formation	 https://www.youtube.com/watch?v=Nhs9pj2je0s
Excision of skin lesion	 https://www.youtube.com/watch?v=hjtRQygj20Q	End to end bowel anastomosis	 https://www.youtube.com/watch?v=48sEjirifmg
Side to side bowel anastomosis	 https://www.youtube.com/watch?v=K9AYvwUQot0	Open hernia repair	 https://www.youtube.com/watch?v=qvdvNQY1o2E
Opening and closing a midline incision	 https://www.youtube.com/watch?v=HaDGCaqASX4	Breast lump excision	 https://www.youtube.com/watch?v=Tg3Pg6f-mjg
Mattress suture	 https://www.youtube.com/watch?v=uXckaxzp0OQ	Open appendicectomy	 https://www.youtube.com/watch?v=zPP8sy1C6-4
Blood vessel ligation	 https://www.youtube.com/watch?v=dpNVBTOR6HU	Repair of bowel serosal tear	 https://www.youtube.com/watch?v=1ppXIkqTiwM

and a total of 271,103 views. During that time, 53 viewers answered a voluntary online survey, providing feedback on the videos included in the channel. Of these, 58.5% were trainees, 9.4% were consultants, 7.6% were research fellows and 24.5% were medical students. Their specialties varied; general surgery was the most common ($n=19$), followed by cardiothoracics ($n=5$) and gastrointestinal surgery ($n=5$).

Responders were based in more than 20 countries; 11 in the United Kingdom, 7 in the United States, 6 in Brazil, 5 in Russia and 24 in other countries.

The responders believe that simulation is important for surgical training (47/53) (Fig. 1) and found the videos relevant to their educational needs (43/53), with most of them

assessing the quality of the videos as good (47/53) and reporting a positive opinion about the length of the videos and the commentary. Interestingly, the responders considered e-learning resources to be as vital as courses and books. However, only a marginal majority said they would change their practice based on these videos (Table 2).

Finally, when asked what they would like to see included in future e-learning outlets, the most popular choice was videos of real procedures; multiple choice questions were a distant second (Table 3).

The results of this survey show that viewers are accepting of online didactic videos. The authors suggest that the quality of online resources should be assessed with similar tools, because

viewership may not necessarily reflect the value of the resources. Furthermore, the future provision of e-learning modules should be guided by the opinions of the respondents.

Discussion

The results of this survey show that viewers are accepting of online didactic videos and have found the ones provided by Yorkshire and the Humber School of Surgery to be fit for purpose and of good quality.

The findings of the current study coincide with current literature. Jayakumar *et al.*⁴ performed a systematic review assessing e-learning in surgical education. They identified three broad areas taught, one of which was technical skills. Of the 38 studies identified, almost all showed substantial knowledge increase. However, the authors of the review noted the necessity for high-quality randomized controlled trials to confirm these findings. Tarpada *et al.*⁵ also conducted a systematic review looking into e-learning resources for orthopaedic surgery. They too concluded that e-learning is an effective adjunct to or even a replacement for traditional teaching techniques but call for validation of the available online resources. This is the aim of this survey, to assess the face and content validity of the previously described online resource of didactic videos. Readily available metrics, such as viewership and number of subscriptions to an online channel, do not necessarily reflect the quality of the didactic material. The standardization of quality assessment outcomes is imperative before the introduction of e-learning in formal training curricula.⁵

Although it is advocated that e-learning can replace traditional methods of teaching,^{5,6} it is not suggested that it can substitute supervised sessions with trainers for surgical trainees.⁶ Nevertheless, didactic lectures, case-based discussions and small-group discussion can be efficiently replaced by e-learning,⁷ through which assessors can track the progress

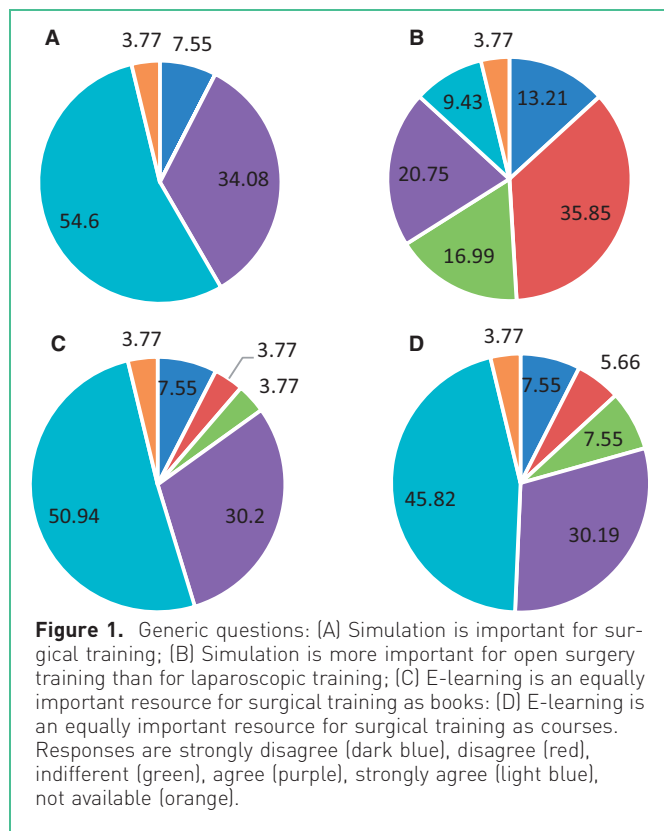


Table 2. Questionnaire results regarding video quality

	Strongly disagree, n (%)	Disagree, n (%)	Indifferent, n (%)	Agree, n (%)	Strongly agree, n (%)	Not available, n (%)
The videos were relevant to my educational needs	4 (7.55)	0 (0.00)	4 (7.55)	18 (33.96)	25 (47.17)	2 (3.77)
I learnt a great deal from these videos	5 (9.43)	2 (3.77)	6 (11.32)	22 (41.51)	17 (32.08)	1 (1.89)
The videos will change my clinical practice	7 (13.21)	4 (7.55)	11 (20.75)	17 (32.08)	12 (22.64)	2 (3.77)
The quality of these videos is good	4 (7.55)	0 (0.00)	0 (0.00)	30 (56.60)	17 (32.08)	2 (3.77)
The length of these videos is just right	4 (7.55)	0 (0.00)	4 (7.55)	31 (58.49)	13 (24.53)	1 (1.89)
The commentary on the videos is appropriate	4 (7.55)	0 (0.00)	4 (7.55)	27 (50.94)	15 (28.30)	3 (5.66)
I would recommend viewing these videos to a colleague	4 (7.55)	0 (0.00)	2 (3.77)	19 (35.85)	26 (49.06)	2 (3.77)

Table 3. Online resources that responders would like to see provided online [1, most important; 6, less important]

	1, n (%)	2, n (%)	3, n (%)	4, n (%)	5, n (%)	6, n (%)
Multiple choice questions on surgical topics	10 (18.87)	5 (9.43)	8 (15.09)	9 (16.98)	13 (24.53)	8 (15.09)
Trainee discussion groups about the shape of training	5 (9.43)	8 (15.09)	5 (9.43)	7 (13.21)	10 (18.87)	18 (33.96)
Live interactive lectures from experts	5 (9.43)	7 (13.21)	14 (26.42)	12 (22.64)	12 (22.64)	3 (5.66)
Illustrations/animation of surgical procedures	4 (7.55)	9 (16.98)	17 (32.08)	12 (22.64)	5 (9.43)	6 (11.32)
Videos of real procedures	21 (39.62)	13 (24.53)	3 (5.66)	3 (5.66)	9 (16.98)	4 (7.55)
More simulated procedures	8 (15.09)	11 (20.75)	6 (11.32)	10 (18.87)	4 (7.55)	14 (26.42)

of trainees communicating electronically without time pressures,⁸ as well as apply assessments, a significant element in assessing knowledge and skill acquisition.⁶

This study has some limitations. The number of responders to the survey is significantly lower than the overall number of viewers. This is because the survey was voluntary; this could be improved in the future by offering an incentive, such as further content, to viewers who complete the survey. Although the quality of the videos is assessed, there is no assessment of skill acquisition and long-term attainment. These are issues that should be addressed in future studies, which should have a comparative element with a homogeneous intervention and a control group. Further, standardization of the outcome measures for assessing the quality of online materials should be re-visited, not by sporadic studies but by national surgical education authorities after achieving a consensus among experts.

Conclusion

Pending standardization of desired didactic outcomes and validation of quality, e-learning videos are a significant weapon in the quiver of surgical educators.

Conflict of interest

None declared.

References

1. MedlinePlus [Internet]. Videos of surgical procedures. Bethesda (MD): National Library of Medicine (US). Available from: <http://www.nlm.nih.gov/medlineplus/surgery/videos.html>.
2. Al-Khatib TA. Surgical education on YouTube. *Saudi Med J* 2014; 35: 221–223. PMID: 24623200.
3. School of Surgery, Yorkshire and the Humber. YouTube™ channel. https://www.youtube.com/channel/UCFQzDQM9Gi8iZZIU_Cc7Kg.
4. Jayakumar N, Brunckhorst O, Dasgupta P, Khan MS, Ahmed K. e-Learning in surgical education: a systematic review. *J Surg Educ* 2015; 72: 1145–1157. <https://doi.org/10.1016/j.jsurg.2015.05.008>.
5. Tarpada SP, Morris MT, Burton DA. E-learning in orthopedic surgery training: a systematic review. *J Orthop* 2016; 13: 425–430. <https://doi.org/10.1016/j.jor.2016.09.004>.
6. Aryal KR, Pereira J. E-learning in surgery. *Indian J Surg* 2014; 76: 487–493. <https://doi.org/10.1007/s12262-014-1092-8>.
7. Riley JB, Austin JW, Holt DW, Searles BE, Darling EM. Internet-based virtual classroom and educational management software enhance students' didactic and clinical experiences in perfusion education programs. *J Extra Corpor Technol* 2004; 36: 235–239. PMID: 15559740.
8. Broudo M, Walsh C. MEDICOL: online learning in medicine and dentistry. *Acad Med* 2002; 77: 926–927. <https://doi.org/10.1097/00001888-200209000-00028>.