



EAES online educational resources: a survey of the membership of the European Association for Endoscopic Surgery (EAES)

Balaji Mahendran¹ · Valerio Celentano^{2,3} · Marek Soltes⁴ · Dorin Popa⁵ · Michel Adamina^{6,7} · Carlos Moreno Sanz⁸ · Bjørn Edwin^{9,10,11} · Mohammed Abu Hilal¹² · Mark Coleman¹

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Abstract

Background The European Association for Endoscopic Surgery (EAES) strives to be a leader in promoting the development and expansion of minimally invasive surgery (MIS). Part of the association’s mission statement is “to become an information hub for all practitioners of MIS”. It is therefore important that the education segment of the association continues to be actively monitored and updated to ensure this mission statement is met. This project aimed to understand the trainees requirement in fulfilling this role, and to develop an practical action plan to ensure such requirements are adequately met.

Methods Two sequential questionnaires were sent to all members of the EAES. The questionnaires sought to understand the demographics of the EAES membership, and their training requirements. This followed a Delphi methodology. The data collected included training status, level of competence in laparoscopic surgery and tools needed for improving laparoscopic skills.

Results Four hundred and sixty-five responded to the first survey, and 209 responded to the second survey. There were 112 trainees (24.1%) in the first round. More than 50% of trainees were less than 8 years from graduation from medical school. Only 162 (34.8%) of respondents performed MIS in more than half their practice. Videos of common procedures were ranked the highest in terms of what trainees required to help improve their laparoscopic skills, followed by e-learning modules.

Conclusion There is a significant training gap identified amongst the trainee population of the EAES with regards to MIS training. Trainees were not performing MIS enough for them to feel confident with their skills. The EAES could fulfill this training requirement via expertly curated videos, and e-learning modules written by senior specialists.

Keywords Surgical education · Minimally invasive surgery · Laparoscopy · Laparoscopic surgical skills

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✉ Balaji Mahendran
balaji.mahendran@nhs.net

¹ Department of Colorectal Surgery, Derriford Hospital, University Hospitals Plymouth NHS Trust, Plymouth PL6 8DH, UK

² Portsmouth Hospitals NHS Trust, Portsmouth, UK

³ University of Portsmouth, Portsmouth, UK

⁴ Pavol Jozef Safarik University, Kosice, Slovak Republic

⁵ University of Medicine and Pharmacy, Carol Davila, Bucharest, Romania

⁶ Department of Surgery, Kantonsspital Winterthur, Winterthur, Switzerland

The European Association for Endoscopic Surgery (EAES) is a European surgical society with a global membership, which has been educating surgeons and surgical trainees in

⁷ University of Basel, Basel, Switzerland

⁸ Department of General Surgery, La Mancha-Centro General Hospital, Alcazar de San Juan, Ciudad Real, Spain

⁹ The Intervention Centre, Oslo University Hospital, Oslo, Norway

¹⁰ Department of HPB Surgery, Oslo University Hospital-Rikshospitalet, Oslo, Norway

¹¹ Institute of Clinical Medicine, Oslo University, Oslo, Norway

¹² Department of General Surgery, Ospedale Fondazione Poliambulanza, Via Bissolati, Brescia, Italy

minimally invasive techniques for almost 30 years [1, 2]. In this time, reductions in residents' working hours, a shift towards competence based training and advances in technology have transformed the way surgeons are trained [3]. This is reflected in the popularity of the EAES, with 3112 members as of 2018.

One of the biggest educational resources available for surgeons in training is the Internet [4]. EAES uses its website (www.eaes.eu) to divulgate content such as presentations from meetings, advertise hands on courses, and share videos on surgical skills and curricula for minimally invasive surgery (MIS) training. The Laparoscopic Surgical Skills (LSS) section of the EAES website is one of the main components dedicated to surgical education. EAES has developed, validated and implemented the LSS as an educational and training curriculum and proficiency assessment tool with an associated E-learning platform and necessary additional tools for institutions to be able to educate and train to the required standard. The LSS Certificate of Accreditation is awarded upon completion of the training curriculum.

Maximizing trainee engagement in the educational opportunities provided by EAES including LSS was the primary objective of this project. This was performed developing and distributing a two round survey. The aim of the study is to use the information provided by the survey to restructure the EAES online education platform to improve the quality of the resources provided and the engagement of the global surgical community.

Methods

Study method

Sequential questionnaires were used similarly to the Delphi methodology [5–7] to inform and direct through an iterative process the development of the survey, which canvassed trainee opinion to ensure engagement by key stakeholders who are EAES members in training. Survey items were selected by discussion through e-mails, teleconferences, and face-to-face meetings.

The initial survey sought to gain basic demographics and components that were thought to be important to trainees, along with the current level of trainee involvement with the LSS and other EAES online educational resources. The second survey was to determine the importance of a shortlist of curriculum items. A final survey will be undertaken once focused changes are put in place within the EAES website.

An institutional review board (IRB) approval was not required for this study as it did not involve any patient identifiable data. However, an informal IRB approval was sought through the education and training committee of the EAES, at the EAES Winter Meeting in 2019. Consent from

participants was implied through their engagement with the survey.

Study participants

All members of the EAES were invited to participate in this survey. This was to help maximize trainee participation in the EAES, and to ensure all views are taken into account in deciding upon the changes required within the educational resources provided by EAES. Questions were included to help stratify the participants according to their level of training.

Survey items

The initial survey [Online Appendix 1] sought to get basic understanding of the membership of the EAES. Its purpose was to understand the experience of the trainee members of the EAES and to attempt an initial prioritization of the resources required. The resources required were derived from what was already available, along with experience of laparoscopic training already published [8]. The first survey also sought to understand in detail the experience of the membership in relation to different types of laparoscopic procedures.

The second survey [Online Appendix 2] then further elaborated upon the resources that were initially presented to trainees in the prior survey, and sought to rationalize the prioritization of the resources provided. It also sought to prioritize the distance learning resources and surgical videos required as part of a library to be set up on the EAES LSS website.

Survey administration

The survey was created using SurveyMonkey, and distributed to the entire membership of the EAES, and its allied organization the Association of Laparoscopic Surgeons of Great Britain and Ireland (ALSGBI), via email. The survey was also advertised through other social media including Facebook and Twitter. Reminders were sent at the 2-week period, and the survey was open for 1 month.

Survey result analysis

Categorical variables are presented as frequency or percentage, while continuous variables are presented as mean (\pm standard deviation) or median (interquartile range) as appropriate.

Statistical analysis was performed by using the Statistical Package for Social Sciences (SPSS version 16.0; SPSS, Chicago, IL, USA). All reported *p* values were two-tailed,

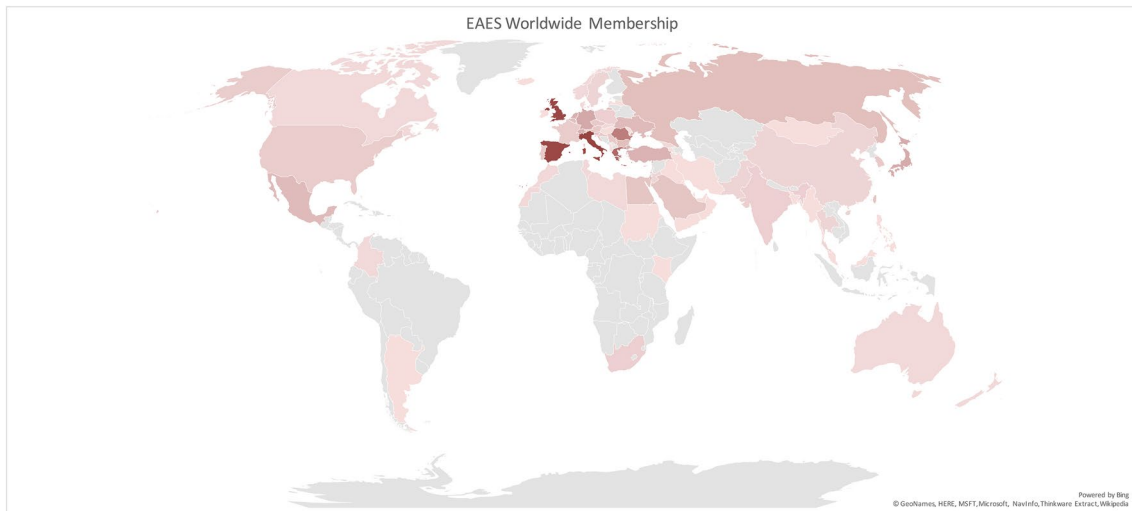


Fig. 1 Map of EAES members responding to survey worldwide

Table 1 Proportion of responders stratified according to time from graduation from medical school

| Time in years | No. |
|---------------|------------|
| 0–2 | 13 (5.4%) |
| 3–5 | 61 (25.3%) |
| 6–8 | 62 (25.7%) |
| 9–10 | 10 (4.2%) |
| > 10 | 53 (22.0%) |
| Unspecified | 42 (17.4%) |

Table 2 Responders specialty (able to choose more than 1 specialty)

| | |
|-----------------|------------|
| General surgery | 172 (37%) |
| Upper GI | 91 (19.6%) |
| Bariatric | 61 (13.1%) |
| HPB | 49 (10.5%) |
| Colorectal | 121 (26%) |
| Urology | 4 (0.9%) |
| Endocrine | 26 (5.6%) |

and p values of less than 0.05 were considered to indicate statistical significance.

Results

Round 1 survey

There was a total of 465 participants. 150/465 (32.3%) responders were between the ages of 25 and 40. 215/465 (46.2%) responders were between 41 and 55, with the rest being above that age group. 392/465 (83.9%) responders were male.

234/465 (50.3%) of responders were from Western Europe, and 137 (29.5%) were from Eastern Europe. Out of the others, the highest proportion of responders was from Asia, followed by Middle East, Americas, Africa and Oceania in that order (Fig. 1).

112/465 responders were reported to be in training, equating to 24.1% of all responders. Responders were also asked about the number of years from graduation that they were in, to estimate their seniority (Table 1).

Table 3 Exclusive specialty of responders (responders who only chose 1 specialty)

| | |
|-----------------|------------|
| General surgery | 61 (13.1%) |
| Upper GI | 8 (1.7%) |
| Bariatric | 6 (1.3%) |
| HPB | 12 (2.6%) |
| Colorectal | 22 (4.7%) |
| Urology | 1 (0.2%) |
| Endocrine | 3 (0.6%) |

Minimally invasive operative experience

A total of 107/465 (23%) had previously undertaken a dedicated fellowship in minimally invasive surgery. A significant number of responders indicated general surgery as their specialty, although there was a high proportion of responders selecting two concurrent specialties. The breakdown is presented in Tables 2 and 3.

The survey also assessed the proportion of minimally invasive surgery performed by responders in their practice. Of those, 54 responders have indicated that this proportion was less than 25%, and 108 indicated that their practice was minimally invasive in 25–50% of cases. Overall,

162/465 responders performed < 50% minimally invasive operations in their daily practice (Fig. 2).

Index laparoscopic operations

All responders in round 1 of this process were asked for the number of index laparoscopic procedures performed. These included appendectomies, cholecystectomies, colonic resections, anti-reflux procedures, sleeve gastrectomies, bariatric bypass, hepatectomies, nephrectomies, prostatectomies, adrenalectomies, and hernia repairs. The breakdown of these cases is shown in Online Appendix 3.

Proportion of Minimally Invasive Surgery performed by survey responders

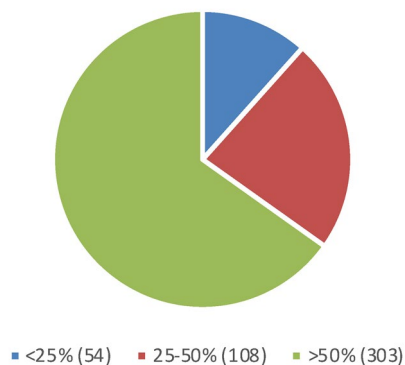
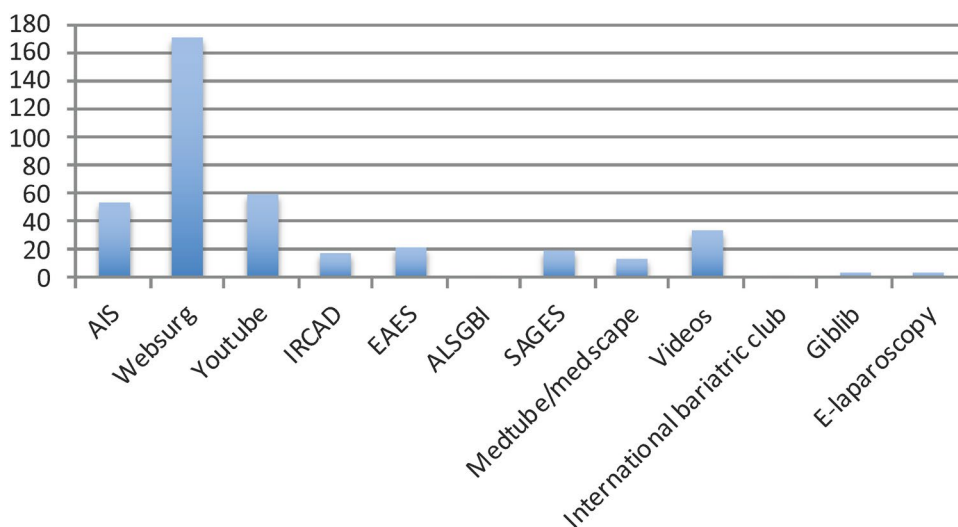


Fig. 2 Proportion of minimally invasive surgery performed by survey responders

Fig. 3 Online resources used by trainees

Sources being used by trainees



LSS usage amongst membership

A large proportion of the responders have been member of EAES for less than 3 years (40.8%). 56% of all responders (n = 259) were aware of the LSS section of the EAES website. Out of these 259, 193 (74.5%) had each visited the site less than 5 times in the last year.

Use of online resources

72.5% of all responders, and 69.6% of trainees indicated that they used online resources to help with their practice. Their specific resource of choice is represented in Fig. 3.

Resources thought to be useful

The survey then asked what resources were required, and what would be considered useful for trainees. These results are represented in Fig. 4.

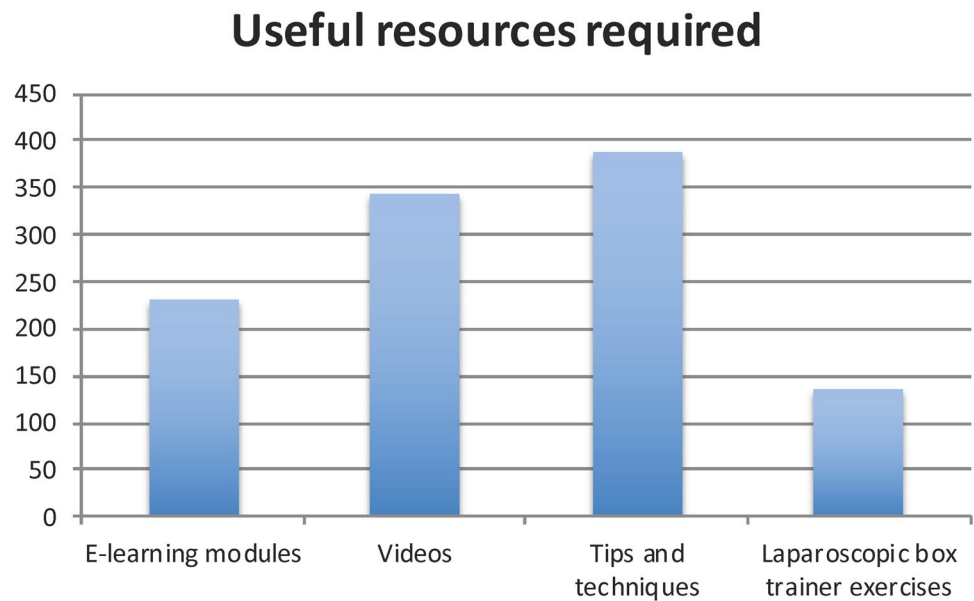
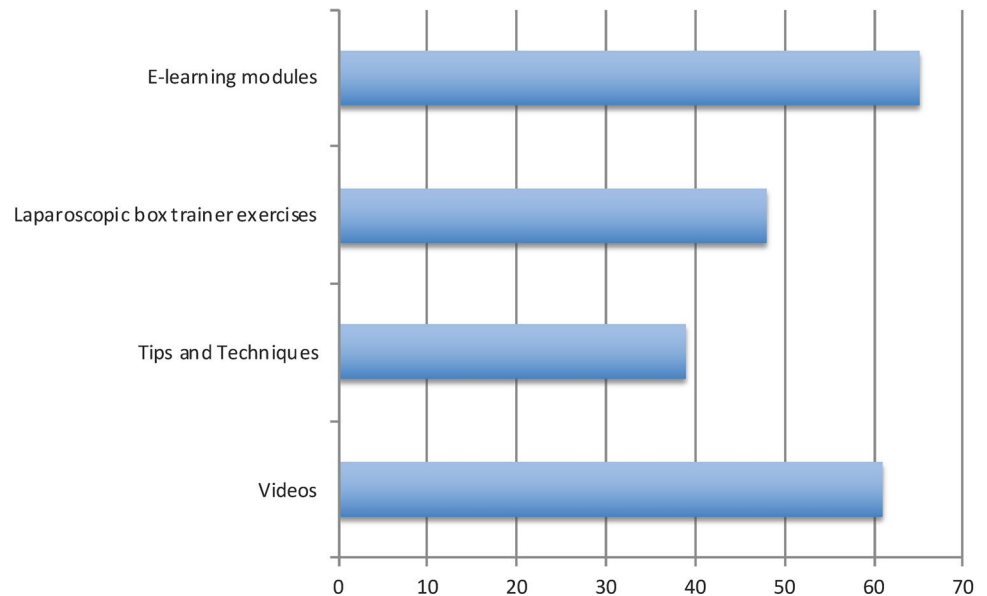
Round 2 survey

There was a total of 209 responses in round 2.

What resource was most desired?

Responders were asked to rank the following in order of importance to the trainees’ learning: videos of common procedures, laparoscopic box trainer exercises, e-learning modules, and tips and techniques for specific procedures.

Figure 5 and 6 shows the resource that was most ranked no 1 and no 2 on the Likert scale respectively.

Fig. 4 Types of resources required by trainees**Fig. 5** Resource ranked no 1 on a Likert scale

E-learning modules were most desired amongst those sampled, followed closely by videos of procedures. Laparoscopic box trainer exercises did not rank highly, whilst tips and techniques were ranked after videos and e-learning modules.

Videos required

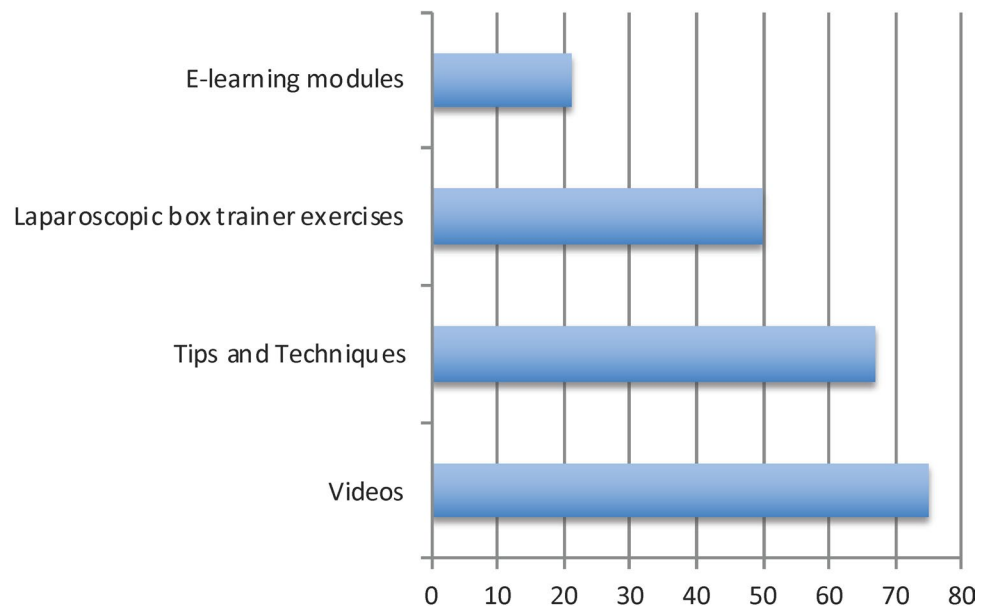
The responders were then asked to rate videos that were required, on 5-point Likert scale, with 5 being the most desired. These were of common procedures, appendicectomies, cholecystectomies, anti-reflux procedures and equivalent procedures. This also included urological procedures such as

nephrectomies and prostatectomies. The results of this part of the survey are shown in Online Appendix 4.

Access to laparoscopic box trainers

68.2% of responders had access to laparoscopic box trainers, with the majority of members spending less than 1 h per week on these box trainers practicing laparoscopic skills.

Fig. 6 Resource ranked no 2 on a Likert scale



Discussion

This study used a 2-round assess the involvement of the EAES membership with the LSS module. This study indicates that instructional videos were the most desired resource for trainees looking to improve their laparoscopic surgical skills, followed by e-learning modules. The LSS is a 2-step program that allows trainees to accredit their laparoscopic surgical training. The second grade focuses on specific advanced laparoscopic procedures such as colonic resections or bariatric surgery. The LSS programme has been validated [9, 10], and there is considerable interest amongst trainees in the utilization of the LSS to improve their surgical skills. However, there is a lack of resources to assist trainees in the completion of this diploma.

There was a wide spread of trainees represented within the surveys, both in experience and geographical location. This reflects the global reach of the EAES, and the need for the LSS to be globally available and relevant. The majority of the responders were less than 8 years from under-graduate qualification—thus validating this survey in assessing the need to address trainees' priorities.

In addition, there was also a spread of trainees between all surgical specialties, with 80.4% of respondents stating a specialist interest in either colorectal, HPB or upper GI surgery. 34.8% of the respondents also indicated that less than half their practice was in minimally invasive surgery. This indicates that trainees may not get adequate exposure to MIS procedures in training, as previously reported [11].

Whilst more than half of those who responded to the survey were aware of the LSS section of the EAES, an overwhelming majority (74.5%) had visited the site less than 5 times in the year preceding the survey. A review of the

website would show that there was a cluttered layout, with no specific educational resources available to those wanting to pursue the LSS diploma, and video links that were non-functioning. This could explain the reason behind the trainees' lack of engagement with the resource.

Nearly 72.5% of all responders, and 69.6% of trainees indicated that they used online resources to help with their practice, while 36.6% of trainees used Websurg—a well-known resource posting peer-reviewed instructional videos of common and complex laparoscopic procedures. Websurg has the advantage of being a strong peer reviewed database of all minimally invasive surgical procedures, including general surgery, urology, gynaecology and neurosurgery. It has a very user-friendly interface, and does not require a monthly subscription. This might explain its relative popularity amongst our target audience.

Interestingly, in the initial round of the survey, 389 responders (83.7%) asked for a “tips and techniques” session, whilst 342 (73.5%) trainees have indicated a requirement for videos. Moreover, 232 (50.0%) considered e-learning modules to be useful in aiding their training. The reason for this is unknown, but the subsequent ranking of resources in round 2 of the process suggested that videos and e-learning modules were actually of a more relevant requirement for many trainees.

This was reiterated again when when trainees were asked about the types of videos trainees they require. Videos on MI appendicectomies, cholecystectomies, colonic resections and anti-reflux procedures, have all ranked high in terms of trainees needs for the videos. This is in keeping with the trainee representation within the surveys, and the relative lack of experience seen within the demographics of the respondents.

This project delineates further action plans for the EAES in order to provide a well-rounded training resource. Firstly, a peer-reviewed video resource showing basic operative techniques will need to be set up. Videos to be submitted to this channel would either take the form of showing the whole procedure, or showing specific parts of the procedure wherein a specific technique could be utilized to make the procedure easier for trainees [12].

The second action point will be the development of e-learning modules. This will have to be undertaken by EAES experts to include the basic theoretical aspects of laparoscopic surgery. This will form a vital second prong in the delivery of training, both for the LSS diploma and for general surgical training.

Finally, future development of the LSS section should include videos and e-learning modules on robotic procedures, and further development of resources required for Grade II of the LSS.

The first step in getting a video repository would be to source the appropriate hosting space for such a library online. A section of the EAES website could be dedicated to this. The second step would be to set up a video sub-committee within the research and education committees of the EAES. This would comprise of an expert panel to also peer review the first few videos. The third step would involve inviting videos of common procedures (appendectomy, cholecystectomy, and segmental colectomies) from consultants/attendings around the world. The key here would be to involve those most likely to benefit from this catalog—the junior surgeons. At this stage, it would be important to get their views on what is required next, and to canvass more videos based on these responses and the metrics of the videos being viewed.

The response rate to our survey was low despite being aimed at a well-identified target population and using electronic methods for dissemination. However, a low participation in this type of initiative is the norm, and found in other such surveys [13, 14], and indeed, a low response rate might be due to a low interest in the LSS section. More than the absolute values, the trends in these types of studies are considered more important [14, 15].

Conclusion

There is significant interest in the development of the EAES educational section of its website for both the completion of training diplomas and to fulfill other surgical skills development requirements. The current EAES online resources do not bridge the training gap felt by surgeons in training. This project has highlighted what trainees consider to be important, and it has suggested a compendium of high-quality

videos and e-learning modules are the first steps in creating this for trainees.

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Compliance with ethical standards

Disclosure Dr. Balaji Mahendran, Dr. Valerio Celentano, Dr. Carlos Moreno Sanz, Dr. Bjørn Edwin and Dr. Mohammed Abu Hilal have no conflicts of interest or financial ties to disclose. Dr. Mark Coleman is a member of the Education and Training sub-committee of the EAES. Dr. Dorin Popa is a member of the Education and Training sub-committee of the EAES. Dr. Marek Soltes is a member of the Education and Training sub-committee of the EAES. Dr. Michel Adamina is a member of the Education and Training sub-committee of the EAES.

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