



Using technology to increase the reach of educational innovation: globalization of a novel departmental journal club

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Abstract

Purpose For educators in areas of surgical subspecialization, our efforts to provide and assess the impact of curricular innovations are oftentimes limited to small numbers of trainees. To enhance collaboration, curricular reach, and consistency of educational experiences, we converted our novel Cardiothoracic Surgery Debate-Style Journal Club (DSJC) to a global, webinar format, open to learners and experts worldwide. In this study, we aimed to assess the feasibility, reach, and success of these events.

Methods We retrospectively reviewed data from webinar-based, virtual DSJCs held monthly from 8/2020 to 8/2021. Collected variables included attendee demographics and feedback regarding the educational value of the events. Descriptive analyses were performed.

Results Six hundred and seventy-eight attendees attended 11 DSJCs during the study period (event mean 62). Trainees originating from our institution accounted for 107 (16%), and included medical students, general surgery residents, and cardiothoracic surgery fellows. Additional attendees were predominantly comprised of external trainees (325, 48%), along with 162 (24%) external faculty and 84 (12%) allied health professionals. Importantly, survey respondents indicated overwhelming appreciation for the DSJC webinars, highlighting their success, with 99% (239/242) recommending the event to colleagues, 98% (238/242) planning to attend again, and 99% (239/242) ranking the educational value of the events as high or very high.

Conclusion Following the webinar launch of our DSJC, we successfully reached an interdisciplinary cohort of attendees, guided by a multi-institutional group of expert educators. This model is efficient, thorough, reproducible, and has greater reach than the conventional journal club model—translating to greater power for educational research.

Keywords Curricular globalization · Debate-style journal club · Surgical trainee education · Webinar

Introduction

While the day-to-day clinical teaching of surgical trainees tends to surround clinical decision-making and technical skills, we often rely on alternative curricular endeavors to teach the practice of evidence-based medicine through critical appraisal of emerging seminal literature. Traditionally, single-article journal clubs have been used to provide the skills needed to navigate, decipher, and critique influential manuscripts [1–4]. With our previous inception of debate-style journal clubs (DSJC), we successfully created a learning environment in which two participant-debaters benefited not only from appraising articles but also from learning to support their clinical decision-making with a body of evidence-based literature [5, 6].

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In creating curricula that foster efficient and comprehensive education, sufficient learner and expert presence at educational events is essential for success and can often remain a challenge for small training programs [3]. In recent years, specialty-specific educational cooperative groups have partially addressed this challenge by disseminating curricular efforts across centers [7] and exploiting the beneficial reach of social media [8]. Webinars and internet-based novel strategies have also been used to maximize reach both in conferences [9], and in journal clubs [10–12]. Following the demonstrated success of our DSJC [5, 6], we converted our local event into a global webinar, which permitted eager learners and contributing experts to attend the events worldwide. We hoped that this advancement would provide a subspecialized curriculum to additional internal trainees as well as to external trainees who may not have access to such educational opportunities.

Thus, we sought to investigate the feasibility, reach, and success of these webinars. We specifically aimed to characterize the discipline, training level, and institution of the registered attendees, including learners and external expert panelists. Further, we aimed to describe the educational value of these events as subjectively reported by attendees, for both internal improvements and as a foundation for further curricular innovations.

Methods

Educational events

The virtual DSJCs were held monthly from 8/2020 to 8/2021. Information regarding these events was shared via the Thoracic Education Cooperative Group (TECoG), through social media posts, and via email to those who opted to receive calendar invitations either through their affiliation with our institution or by voluntarily signing up for future invites at prior DSJCs. The events were conducted using the webinar function of the Zoom platform (San Jose, CA, USA). Access was made available to all attendees who clicked the link to register, with the option to register in advance or in real time when joining the event. Registration was required for all attendees, which was used to obtain consent, as well as to obtain demographic data regarding the participating cohort. The registrant's email address was used to determine their home institution when provided. Each DSJC event lasted 90 min and was conducted in the standard format of a debate, as previously described by our group [5–7]. Briefly, these debates are comprised of back-and-forth discussion between 2 clinical cardiothoracic surgery fellows at a single institution, with arguments surrounding a clinical scenario. Two potential therapeutic approaches are defended by the trainees, who have been prospectively assigned to a

specific side in advance while using the existing body of literature to support one's position and to refute the opponent's position. The debates were moderated by internationally recognized leaders of the specific field represented in the clinical scenarios.

During the events, numerous metrics were obtained via the embedded polling feature. The first 2 polls asked the attendees to answer which of the 2 therapeutic approaches they would select for the hypothetical patient, with 1 poll before the debate presentations and the second poll after the completion of the arguments. The third and fourth polls enabled attendees to score and provide feedback to the 2 debaters. The fifth poll was comprised of 5 questions specifically aimed to gather information regarding the attendees' perceptions of the event, with answer choices provided using a 5-point Likert scale, as well as options for free-text feedback. These questions related to the breadth of the discussion (5 = "very thorough"), the realistic nature of the scenarios (5 = "extremely realistic"), one's likelihood of attending future events (5 = "extremely likely"), whether participants would recommend the event to others (5 = "extremely likely"), and the perceived educational value of the DSJC (5 = "excellent").

Data sources and outcome measurements

We conducted a retrospective review of metrics related to the DSJC following approval by the MD Anderson Cancer Center Internal Review Board (PA16-0416).

Data sources for this study included webinar registration logs and poll responses. Using the registration logs, attendees of the events were categorized by training level, including whether they were medical students, residents, or fellows. Attendees were also stratified by discipline, which was separated between physician and allied health professional. Furthermore, DSJC participants were also categorized as originating from the institution hosting the event, or an external institution. Surveys were reviewed and specific responses to the final poll were extracted to identify frequency of responses to each question and to characterize scores within the Likert-scaled items.

Statistical analyses

Descriptive analyses were performed regarding the total number, vocation, training level, and institution of origin of attendees for each event and cumulatively. The results of the surveys relating to feedback were also described. Relative trends in event attendance and event participant perceptions were assessed with a Cochran-Armitage test. All statistical analyses were performed using GraphPad Prism (version 9.3.1 for Windows, GraphPad Software, San Diego, California USA).

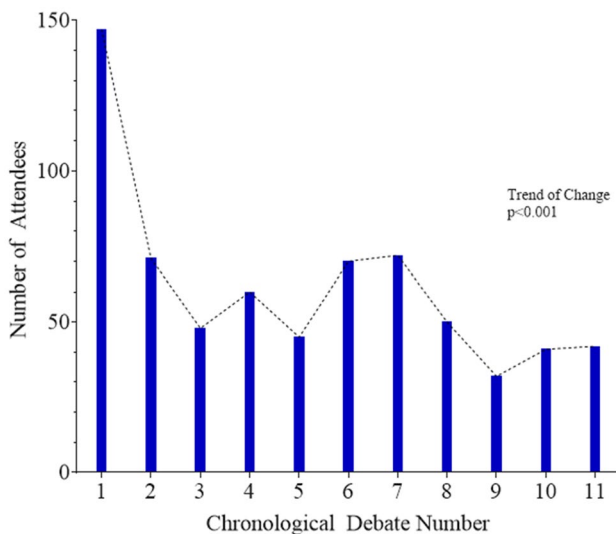


Fig. 1 Total attendees per debate in chronological order over the study period revealing the change in attendance over time. The trend of change over time was assessed by Cochran-Armitage Test

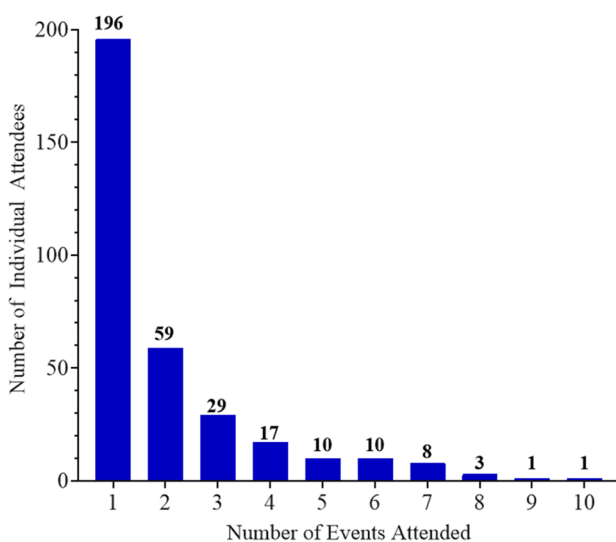


Fig. 2 Representation of the amount of repeat attendees by number of event attended

Results

Attendee characteristics and event attendance

During the span of the study period, there were 11 DSJC, with a total of 678 attendees (Fig. 1). There were 334 individual attendees who participated, among whom 138 (41.3%) were repeated attendees, and 79 (23.7%) attended 3 or more DSJC over the study period (Fig. 2). The average

event attendance was 62 participants (range 32–147). In evaluating the attendance per event, we noted a small but significant downward trend over time ($p < 0.001$, Fig. 1).

Trainees included medical students, residents, and fellows, and originated from the institution hosting the event for 16% (107) of the attendees. External trainees accounted for 48% (325) of the attendees and were the largest group of event participants. 24% (162) of the attendees were faculty surgeons, which included both internal and external experts invited to attend the event. Lastly, there were a total of 84 (12%) allied health professionals who attended the events (Fig. 3). Among all participants, there were an average of 21 institutions (standard deviation: 8) represented at each event,

Event feedback

Quality metric polling revealed that 98.4% (238/242) of DSJC participants were likely to attend future events (Likert scale > 3) and that 98.8% (239/242) would recommend the event to colleagues (Likert scale > 3). The breadth of discussion during the DSJC was rated as high or very high by 98.4% (238/242) of the attendees, while 98.8% (239/242) rated the educational value of the DSJC as high or very high. The realistic nature of the scenarios was rated as high or very high by 95.9% (232/242) of the attendees (Fig. 4).

When evaluating the trend of feedback by quality metric, and over time, we did not find any significant change in the proportion of attendees who would attend the DSJC again ($p = 0.154$) nor in the proportion who would recommend the event to others ($p = 0.156$). The responses regarding the breadth of the discussion, the realistic nature of the scenario, and the educational value of the DSJC were stable over time ($p = 0.168$, $p = 0.184$, $p = 0.171$, respectively).

Discussion

The integration of surgical trainee education in a demanding clinical schedule requires modern and novel approaches. With the inception of our debate style journal club, we provided a valuable and effective method to cover an extensive curriculum that surrounded critical appraisal and integration of literature to support clinical-decision making [5–7, 13]. Moreover, in this study, we demonstrated the feasibility and efficacy of utilizing software-based webinars to expand the reach of this curricular effort. New technological strategies were introduced to us all through the rapidly evolving pandemic-era changes in our paradigm of communication. By embracing these strategies, we managed to provide an educational opportunity to a large number of diverse local and global attendees.

Prior authors have reported decreased practice of evidence-based medicine among North American surgery

Fig. 3 Distribution of a Debate-Style Journal Club's attendees, over 11 events, by institutional status, training level, and discipline

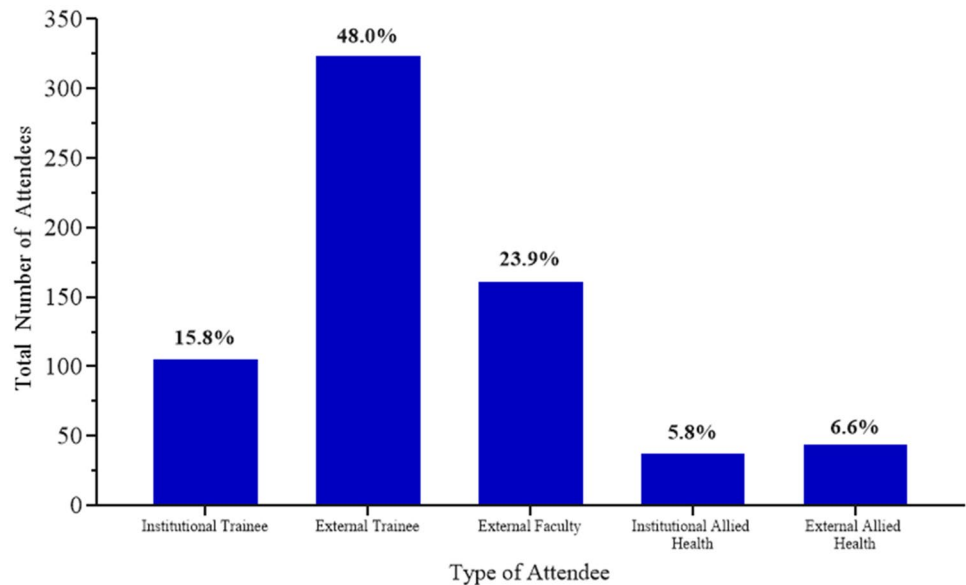
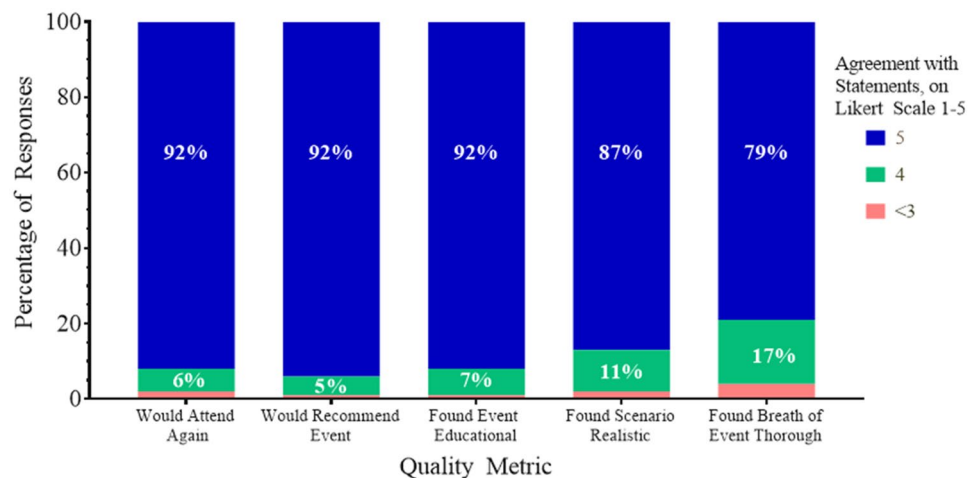


Fig. 4 Representation of attendee feedback, by quality metric, and Likert scale response, stacked to 100% of responses



residents [7, 14]. A robust journal club as we have described herein may enable the prevention of such deficiencies in resident education. In its early stages, this opportunity was beneficial to local cardiothoracic surgery (CTS) fellows and general surgery residents; attendance and participation in the journal club was associated with knowledge acquisition and retention [6], as well as improved oral presentation skills [7]. Our debate-style curriculum may have alleviated the challenges met by traditional journal clubs, from which the educational value has been previously questioned [2, 15]. Not only was our local DSJC moderated, an attribute associated with curricular benefit [4], it also significantly encouraged the navigation of seminal literature, along with its appraisal by the participants, which are all valuable characteristics sought after in the development of a journal club [3]. However, optimal attendance [3, 16, 17] was challenged by clinical responsibilities and off-site rotations. Moreover,

the expertise to which the participants were exposed and the body of learners to which the curriculum was offered was limited to the immediate, local level.

Following the conversion of our DSJC into an internet-based webinar, which encouraged virtual attendance and increased its curricular reach, the average attendance grew to 10 institutional trainees per event. This included advanced clinical fellows and general surgery residents, along with medical students with an interest in CTS. Importantly, this change permitted general surgery residents and medical students to gain early exposure to CTS, which may otherwise be lacking [18, 19], a strategy that could serve as a solution for the ongoing multifactorial challenge leading to gender differences in young trainees with an interest in CTS [20]. While the virtual advancement optimized the attendance of institutional trainees, it also allowed the curricular reach of the DSJC to grow nationally and internationally. This was

integral to our mission to minimize restrictions to education, and enabled an average of 30 trainees per DSJC to join from external institutions, likely providing a curricular opportunity not otherwise available. Concurrently, this globalization granted external faculty, including authors of discussed seminal manuscripts, to participate in the journal club, which provided an increased diversity in expertise for all learners.

Considering the importance of multidisciplinary collaboration in the management of patients undergoing cardiothoracic interventions [21, 22], our DSJC reached a significant amount of allied health professionals. The participation in the journal club provides insight relating to how decisions are made at the faculty surgeon level and might lead to a better understanding of management plans, including specific details in treatment strategies, which may in turn improve multidisciplinary teamwork.

While our DSJC had a slight downward trend in attendance over the length of the study, the quality of the events was observed to remain very high. The decrease in attendance may be secondary to the easing of pandemic precaution allowing extra-institutional attendees to return to their own institutional journal club, or potential webinar fatigue. Nonetheless, the attendance at our events continues to exceed the threshold of a successful journal club, and warrants further efforts.

There are some limitations associated with this work. Data relating to attendee characteristics were gathered by features only available via the webinar interface, which prevents a comparison of the curricular reach to previous DSJC. However, the reach of our events is undoubtedly broader than a conventional in-person-only journal club.

Conclusion

While our DSJC appeared to be successful in providing an educational benefit to our local trainees, the augmentation of curricular reach using technology led to an average of 62 participants per event, with close to 50% of attendees being external trainees, now able to take advantage of this enormously educational opportunity. Furthermore, it permitted the participation of national and international experts in discussions surrounding important, realistic, and didactic scenarios. Information about future monthly DSJC is advertised on Twitter via the senior author (@maraantonoff), and are free for all to join.

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Writing—original draft preparation: ND, JGYL, TCN, ALE, AAV, RAH, MBA; Writing—review and editing: ND, JGYL, TCN, ALE, AAV, RAH, MBA; Funding acquisition: none; Resources: none; Supervision: MBA.

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Data availability Data will be made available upon request.

Declarations

Conflict of interest The authors have no relevant financial or non-financial interests to disclose.

Institutional review board approval The University of Texas MD Anderson Cancer Center IRB, Protocol #PA16-0416.

References

- Ahmadi NM, et al. Teaching evidence based medicine to surgery residents-is journal club the best format? A systematic review of the literature. *J Surg Educ*. 2012;69(1):91–100.
- Shifflette VMD, et al. Current approaches to journal club by general surgery programs within the southwestern surgical congress. *J Surg Educ*. 2012;69(2):162–6.
- Campbell ST, Kang JR, Bishop JA. What makes journal club effective?—A survey of orthopaedic residents and faculty. *J Surg Educ*. 2018;75(3):722–9.
- McLeod RSMDFF, et al. A moderated journal club is more effective than an Internet journal club in teaching critical appraisal skills. *J Am Coll Surg*. 2009;209(3):S113.
- Antonoff MB, et al. A structured, debate-style cardiothoracic surgery journal club for trainee acquisition and application of seminal literature. *MedEdPORTAL*. 2016;12:10521–10521.
- Luc JGY, et al. Novel debate-style cardiothoracic surgery journal club: results of a pilot curriculum. *Ann Thorac Surg*. 2017;104(4):1410–6.
- Luc JGY, et al. Multi-institutional evaluation of a debate-style journal club for cardiothoracic surgery trainees. *Ann Thorac Surg*. 2021.
- Ni hCi T, et al. Trainee thoracic surgery social media network: early experience with tweetchat-based journal clubs. *Ann Thorac Surg*. 2020;109(1):285–90.
- Richardson ML, et al. Running an online radiology teaching conference: why it's a great idea and how to do it successfully. *Acad Radiol*. 2012;19(6):746–51.
- Yang PRBS, Meals RAMD. How to establish an interactive conference and ejournal club. *J Hand Surg*. 2014;39(1):129–33.
- Mayer HF, et al. Introducing the virtual European journal of plastic surgery journal club. *Eur J Plast Surg*. 2020;43(4):363–4.
- MacRae HM, et al. Teaching practicing surgeons critical appraisal skills with an Internet-based journal club: a randomized, controlled trial. *Surgery*. 2004;136(3):641–6.
- Kitchens JM, Pfeifer MP. Teaching residents to read the medical literature: a controlled trial of a curriculum in critical appraisal/clinical epidemiology. *J Gen Intern Med*. 1989;4(5):384–7.
- Bhandari M, et al. Challenges to the practice of evidence-based medicine during residents' surgical training: a qualitative study using grounded theory. *Acad Med*. 2003;78:1183–90.
- Hryciw N, Knox A, Arneja JS. How well are we doing at teaching critical appraisal skills to our residents? A needs assessment of plastic surgery journal club. *Plastic Surg*. 2017;25(4):261–7.

16. Deenadayalan Y, et al. How to run an effective journal club: a systematic review. *J Eval Clin Pract.* 2008;14(5):898–911.
17. McGlacken-Byrne SM, et al. Journal club: old tricks and fresh approaches. *Archives of disease in childhood. Educ Pract.* 2020;105(4):236–41.
18. Luc JGY, Stamp NL, Antonoff MB. Social media as a means of networking and mentorship: role for women in cardiothoracic surgery. *Semin Thorac Cardiovasc Surg.* 2018;30(4):487–95.
19. Vaporciyan AAMD, et al. Factors affecting interest in cardiothoracic surgery: survey of North American general surgery residents. *Ann Thorac Surg.* 2009;87(5):1351–9.
20. Miller VM, et al. Gender differences in cardiothoracic surgery interest among general surgery applicants. *Ann Thorac Surg.* 2021;112(3):961–7.
21. Johnson AM, et al. Timing and amount of physical therapy treatment are associated with length of stay in the cardiothoracic ICU. *Sci Rep.* 2017;7(1):17591–9.
22. Katz NMMD. Meeting the expanded challenges of the cardiothoracic intensive care unit. *J Thorac Cardiovasc Surg.* 2015;150(4):777–8.

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