Webinar Education in Ophthalmology during the COVID-19 Pandemic: A Survey Study

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Research article

Keywords: Webinars, education in ophthalmology, flipped-classroom, education during COVID-19

Posted Date: September 21st, 2020

DOI: <https://doi.org/10.21203/rs.3.rs-72177/v1>

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Abstract

Background: Ophthalmology education is changing amidst the COVID-19 pandemic. The purpose of this study is to describe and evaluate the implementation of webinars combined with online resources for review for ophthalmology trainees.

Methods: This is a single-center descriptive survey study. A validated survey tool was distributed 2 months after implementation of webinar education. The survey population comprised residents, fellows, and faculty in a Chicago ophthalmology training program.

Results: Eighteen residents (100% response rate), 9 fellows (81.8% response rate) and 20 faculty members (44.4% response rate) responded to the survey. Barriers to webinar education and limitations to learning during webinars were rated as low in both groups (avg. 1.98 ± 2.04 and 2.16 ± 1.82 , respectively). The educational value of the webinars was moderately well rated (avg. 7.35 ± 1.66). Interest in webinars replacing in-person lectures was neutral (avg. 5.45 ± 2.54). Faculty expressed fewer barriers ($p = 0.005$), and a higher preference to use webinar education frequently ($p = 0.003$) and instead of in-person lectures ($p = 0.009$), compared to trainees.

Conclusions: The findings of this survey suggest that webinars in ophthalmology education are effective and feasible, with some perceived limitations.

Introduction

Medical education is undergoing a transformative change amidst the COVID-19 pandemic. With social distancing measures, educators have transitioned to web-based learning platforms, to train future physicians globally.¹⁻⁵ Given the unknown time course of the pandemic, adaptations to the medical curriculum are being made quickly and evaluated to maintain high-quality education.⁶

Live interactive webinars have been shown to be well perceived and effective for ophthalmology resident education.^{7,8} The flipped classroom, a form of blended learning includes pre-class learning followed by discussion, has also been shown to be preferred by ophthalmology residents.⁹ However, the literature regarding an entirely online flipped classroom approach for ophthalmology training remains scarce.

In this study, we describe and evaluate the implementation of webinars using the flipped classroom for ophthalmology education at the Department of Ophthalmology, University of Illinois at Chicago (UIC) during the COVID-19 pandemic. The purpose was to assess the accessibility, effectiveness, and feasibility of this educational technique based on participant feedback through a survey tool.

Methods

This was a single-center survey study conducted at UIC was approved by the UIC Institutional Review Board. Participants included all UIC ophthalmology residents, fellows, and several faculty (many who

taught and attended webinars given by other faculty). The survey was based on 43 webinars, 23 of which had online resources available for review prior to the webinar between April 2020 and May 2020. Cisco WebEx (Milpitas, California) was used for webinars, and Box (Redwood City, California) was used for cloud storage of online resources. The anonymized survey was administered online (www.qualtrics.com). Electronic informed consent was obtained from participants. Survey questions were modified from previously validated questionnaires, specifically the Medical E-learning Evaluation Survey (MEES)¹⁰ and the Systems Usability Scale (SUS)¹¹ and underwent internal content validation. From MEES, we used 3 questions with a Likert scale of 0 to 10, followed by 3 open ended questions, focused on barriers to E-learning, learning enhancers, and learning discouragers. From SUS, we used 6 questions with a Likert scale of 0 to 10, focused on ease of use and user satisfaction. Survey questions regarding the educator experience were added and content screened by 2 attending ophthalmologists (PM and DE). The survey tool may be viewed in the e-Appendix.

The survey was distributed to participants via email 2 months after the implementation of webinar education. Data collected from surveys was analyzed by SPSS (version 26). Fellows' and residents' responses were grouped together as "trainees" for analysis. Quantitative and qualitative data was analyzed with descriptive statistics. Student's T-test and Wilcoxon test were used to compare means between trainees and faculty. A significance level of $p \leq 0.05$ was used for all statistical analysis.

Results

The survey was completed by 18 residents (100% response rate), 9 fellows (81.8% response rate) and 20 faculty members (44.4% response rate). Results are described in Table 1. Trainees attended on average more webinars (avg. 50–75%) than faculty (avg. 25–50%)($p = 0.03$).

Table 1
Characteristics and responses of participants who completed the webinar survey

	Trainees	Faculty	P-value
Webinars attended:	4(14.8%)	6 (30.0%)	p = 0.03*
0–25%	3 (11.1%)	10 (50.0%)	
25–50%	15 (55.6%)	0 (0.0%)	
50–75%	5 (18.5%)	4 (20.0%)	
75–100%			
Device used:	21 (77.8%)	12(60.0%)	p = 0.08
Laptop	5 (18.5%)	2 (10.0%)	
Phone	0 (0.0%)	6 (30.0%)	
Desktop	1 (3.7%)	0 (0.0%)	
Tablet			
On a scale of 0–10, did you experience barriers to starting the webinar education?	Mean: 2.65 ± 2.23 Median: 2.0 Mode: 0 Range: 0–8	Mean: 1.05 ± 1.39 Median: 1.0 Mode: 0 Range: 0–5	p = 0.005*
On a scale of 0–10, how educational was the online learning for you?	Mean: 7.19 ± 1.63 Median: 7.5 Mode: 8 Range: 4–10	Mean: 7.58 ± 1.77 Median: 8.0 Mode: 8 Range: 2–10	p = 0.435

	Trainees	Faculty	P-value
On a scale of 0–10, did you experience any limitations in the E-learning that prevented you from learning?	Mean: 2.69 ± 1.98 Median: 2.0 Mode: 0 Range: 0– 9	Mean: 1.42 ± 1.31 Median: 2.0 Mode: 0 Range: 0– 5	p = 0.073
On a scale of 0–10, did you experience difficulty sharing your content on Webex?	Mean: 1.47 ± 1.66 Median: 1.0 Mode: 0 Range: 0– 5	Mean: 1.56 ± 2.12 Median: 1.0 Mode: 0 Range: 0– 7	p = 0.867
On a scale of 0–10, do you think webinar education can replace in-person lectures moving forward?	Mean: 4.72 ± 2.49 Median: 5.0 Mode: 5 Range: 0– 10	Mean: 6.61 ± 2.23 Median: 7.0 Mode: 5 Range: 1– 10	p = 0.009*
On a scale of 0–10, I thought WebEx was easy to use	Mean: 6.96 ± 1.97 Median: 7.0 Mode: 8 Range: 1– 10	Mean: 7.78 ± 1.99. Median: 8.0 Mode: 8 Range: 3– 10	p = 0.243

	Trainees	Faculty	P-value
On a scale of 0–10, I found WebEx very cumbersome to use	Mean: 3.12 ± 2.13 Median: 2.0 Mode: 2 Range: 1– 8	Mean: 2.17 ± 2.04 Median: 2.0 Mode: 2 Range: 0– 7	p = 0.184
On a scale of 0–10, I would imagine that most people would learn to use WebEx very quickly	Mean: 7.35 ± 1.58 Median: 8.0 Mode: 8 Range: 4– 10	Mean: 8.0 ± 1.19 Median: 8.0 Mode: 8 Range: 6– 10	p = 0.081
On a scale of 0–10, I think I would need the support of a technical person to be able to use WebEx	Mean: 1.06 ± 1.25 Median: 1.0 Mode: 0 Range: 0– 5	Mean: 1.22 ± 1.45 Median: 1.0 Mode: 0 Range: 0– 6	p = 0.840
On a scale of 0–10, I think I would like to use WebEx frequently	Mean: 5.41 ± 2.53 Median: 6.0 Mode: 7 Range: 2– 9	Mean: 7.50 ± 2.01 Median: 8.0 Mode: 7 Range: 3– 10	P = 0.003*

	Trainees	Faculty	P-value
On a scale of 0–10, I found the various functions in WebEx were well integrated	Mean: 6.06 ± 2.14 Median: 7.0 Mode: 7 Range: 2–9	Mean: 7.37 ± 1.98 Median: 8.0 Mode: 7 Range: 3–10	P = 0.063

Barriers to accessing E-learning resources on Box were rated low; trainees rated barriers 2.65 ± 2.23 while faculty rated barriers 1.05 ± 1.39 ($p = 0.005$). The main barriers were that shared resources for E-learning were not easily accessible (8 of 27 trainees[29.6%]; 0 of 20 faculty), and the shared resources provided were not concise (6 of 27 trainees[22.2%]; 1 of 20 faculty [5.0%]). Limitations to learning during webinars were low: rated 2.69 ± 1.98 by trainees, and 1.42 ± 1.31 by faculty. The top learning limitations were technical issues with audio/visual (15 of 27 trainees[55.6%]; 7 of 20 faculty[35.0%]) and distracting audio from other participants (14 of 27 trainees[51.9%]; 7 of 20 faculty[35.0%]).

Twenty-three of 24 (95.8%) educators shared content for webinars. The difficulty of sharing content was rated low (1.61 ± 1.95). Majority of educators (18 of 24 [75.0%]) shared published literature, and the most common presentation styles were PowerPoint slides (25 of 30 [83.3%]) and interactive group discussion (15 of 30 [50.0%]).

The educational value of the webinars was rated as moderately high by most participants (trainees: 7.19 ± 1.63 , faculty: 7.58 ± 1.77). The top learning enhancers were that webinars were interactive (23 of 27 trainees[85.2%]; 10 of 20 faculty[50.0%]), and participants were able to prepare for the webinars by reviewing the shared content (14 of 27 trainees[51.9%]; 5 of 20 faculty[25.0%]). Usability and satisfaction of WebEx was rated moderately high. Participants rated WebEx easy to use (trainees: 6.96 ± 1.97 , faculty: 7.78 ± 1.99) and quick to learn (trainees: 7.35 ± 1.58 , faculty: 8.00 ± 1.19). The overall interest in using WebEx frequently for education was rated 6.16 ± 2.52 ; trainees responded less favorably (5.41 ± 2.53) while faculty responded more favorably (7.50 ± 2.01) ($p = 0.003$). When asked whether webinar education could replace in-person lectures, the response was neutral (5.45 ± 2.54); trainees responded less favorably (4.72 ± 2.49) while faculty responded more favorably (6.61 ± 2.23) ($p = 0.009$) towards webinars replacing in-person lectures.

Discussion

The COVID-19 pandemic and social distancing measures have shifted in-person education to E-learning and webinars,^{5, 12} often in flipped classroom approach.¹³ This survey study aimed to evaluate trainees' and faculty's perceptions of recently implemented of web-based education.

E-learning resource sharing and webinar accessibility was well perceived by participants. Barriers to E-learning resources appeared to be higher with trainees than faculty, as the resources shared were felt to be lengthy/excessive. Since faculty did not attend many webinars in which they were not the educators, and likely did not need to review shared material prior to webinars as much as trainees, their perceived barriers were lower. Sharing of E-learning material that are focused and concise might help improve ratings. Learning limitations were primarily related to the technical issues with WebEx, although WebEx usability was rated overall favorably based on SUS statements - being easy to use, quick to learn, and having well integrated functions. Finding a stable internet connection, removing background noise, and using a headset can help optimize video and audio. In addition, preparation, such as running a test session by webinar hosts is recommended to ensure adequate internet connection, screen sharing, and ability to mute/unmute participants.¹⁴

The educational value of webinars was rated highly, and most participants were interested in using WebEx more frequently, however interest in having webinars replaced in-person lectures was neutral. Interestingly, trainees preferred in-person lectures slightly more than webinars, while faculty preferred webinars instead of in-person lectures. Faculty also preferred using WebEx more than trainees. These findings may reflect differing values of participants; for example, residents may value in-person interactive discussion while faculty may value the increased flexibility that web-based education permits. Inclusion of more interactive components such as quizzes/polls and personal anecdotes may improve participant engagement. Recorded sessions may further increase trainees' perception of webinars.¹⁴

The study limitations include its relatively small sample size and single-center study population, though we feel that the number of webinars provided to this group was adequate to get reasonable feedback from both trainees and educators. A longitudinal multi-institutional webinar series with periodic surveys may provide additional insight on the utility of webinars in post-graduate medical education in ophthalmology.

Conclusions

Online education is being using for ophthalmology training worldwide during the COVID-19 pandemic.¹⁵⁻¹⁷ Although this survey study was based in the United States, we believe that the findings are applicable globally. Overall, we found that sharing E-learning resources and webinar education in ophthalmology was well perceived by both trainees and faculty during the COVID-19 pandemic. This study showed that online flipped-classroom education was rated moderately high in terms of accessibility, educational value, and usability. Future improvements by providing focused E-learning resources, pre-planning webinars with interactive components, improved familiarity with technology involved, and recording webinars may enhance webinar-based education as the preferred tool for some aspects of ophthalmic education.

List Of Abbreviations

UIC University of Illinois at Chicago

COVID-19 Coronavirus Disease 2019

MEESE Medical E-learning Evaluation Survey

SUS Systems Usability Scale

Declarations

Ethics approval and consent to participate:

Yes, this study was approved by the UIC Institutional Review Board, Ref #2020-0561

Consent for publication:

Yes

Conflicts of interest/Competing interests:

None

Availability of data and material:

Survey results available in Table 1, and survey available in supplemental material

Funding:

None

Authors' contributions:

All authors contributed to the study conception and design. Material preparation, data collection and analysis were performed by Katherine Joltikov, Deepak Edward and Peter MacIntosh. The first draft of the manuscript was written by Katherine Joltikov and all authors commented on previous versions of the manuscript. All authors read and approved the final manuscript.

Acknowledgements:

The authors would like to thank Smajo Omanovic, MD and the Research Open Access Publishing (ROAAP) Fund of the University of Illinois at Chicago for financial support towards the open access publishing fee for this article.

References

1. Rose S. Medical Student Education in the Time of COVID-19. *Jama*. 2020;323(21):2131–2132.
2. Li L, Xv Q, Yan J. COVID-19: the need for continuous medical education and training. *Lancet Respir Med*. 2020;8(4):23.
3. Mian A, Khan S. Medical education during pandemics: a UK perspective. *BMC Med*. 2020;18(1):100.
4. Moszkowicz D, Duboc H, Dubertret C, Roux D, Bretagnol F. Daily medical education for confined students during COVID-19 pandemic: a simple videoconference solution. *Clin Anat*. 2020;Apr 6: doi: 10.1002/ca.23601. [Epub ahead of print].
5. Reinholz M, French L. Medical education and care in dermatology during the SARS-CoV2 pandemia: challenges and chances. *J Eur Acad Dermatology Venereol*. 2020:0-2.
6. Eva KW. Medical Education Adaptations: Really Good Stuff for Educational Transition during a Pandemic. *Med Educ*. 2020; 54:494-494
7. Grover S, Kelmenson AT, Chalam K V, Edward DP. Webcasts for resident education. *Ophthalmology*. 2012;119(1):199-200.e1.
8. Mayorga E, Golnik K, Palis G. One-Year Progress in Ophthalmic Education: Annual Review. *Asia-Pacific J Ophthalmol (Philadelphia, Pa)*. 2015;4(6):388-398.
9. Cabrera MT, Yanovitch TL, Gandhi NG, Ding L, Enyedi LB. The flipped-classroom approach to teaching horizontal strabismus in ophthalmology residency: a pilot study. *J AAPOS Off Publ Am Assoc Pediatr Ophthalmol Strabismus*. 2019;23(4):200.e1-200.e6.
10. de Leeuw RA, Westerman M, Walsh K, Scheele F. Development of an Instructional Design Evaluation Survey for Postgraduate Medical E-Learning: Content Validation Study. *J Med Internet Res*. 2019;21(8):e13921.
11. Brooke J. SUS: a retrospective. *J Usability Stud*. 2013;8(2):29-40.
12. Kogan M, Klein SE, Hannon CP, Nolte MT. Orthopaedic Education During the COVID-19 Pandemic. *J Am Acad Orthop Surg*. 2020;28(11):e456-e464.
13. Chick RC, Clifton GT, Peace KM, et al. Using Technology to Maintain the Education of Residents During the COVID-19 Pandemic. *J Surg Educ*. 2020;77(4):729-732.
14. Lewis PJ, Catanzano TM, Davis LP, Jordan SG. Web-based Conferencing: What Radiology Educators Need to Know. *Acad Radiol*. 2020;27(3):447-454.
15. Ferrara M, Romano V, Steel DH, et al. Reshaping ophthalmology training after COVID-19 pandemic. *Eye (Lond)*. July 2020:1-9.
16. TY, Bandello F. Academic Ophthalmology during and after the COVID-19 Pandemic. *Ophthalmology*. 2020;127(8):e51-e52.

17. Mishra D, Nair AG, Gandhi RA, et al. The impact of COVID-19 related lockdown on ophthalmology training programs in India - Outcomes of a survey. *Indian J Ophthalmol*. 2020;68(6):999-1004.

Supplementary Files

This is a list of supplementary files associated with this preprint. Click to download.

- [eAppendix1.docx](#)