



Comparing Clinician Engagement With Medical Education Content on a Clinician-Only Versus a Public Medical Education Website

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Student Name: Kristan Scott, BA

Scholarly Report Title: Comparing Clinician Engagement with Medical Education Content on a Clinician-Only Versus a Public Medical Education Website

Mentor Name(s) and Affiliations:

Traci A. Wolbrink, M.D., M.P.H is an Assistant professor, Department of Anaesthesia, Harvard Medical School, and Associate in Critical Care Medicine, Division of Critical Care Medicine, Department of Anesthesiology, Perioperative and Pain Management, Boston Children's Hospital, Boston, Massachusetts.

Dennis Daniels, MD is an Instructor, Department of Anaesthesia, Harvard Medical School, and Assistant in Critical Care Medicine, Division of Critical Care Medicine, Department of Anesthesiology, Perioperative and Pain Management, Boston Children's Hospital, Boston, Massachusetts.

Abstract

Purpose: The number of online resources for medical education is rapidly increasing, as are the potential platforms for disseminating these resources. OPENPediatrics is a web-based social learning program that utilizes both a clinician-only web-based platform and social media to publish medical education videos. The aim of this work was to compare clinician engagement with medical education videos on the OPENPediatrics website (www.OPENPediatrics.org) and its public social media platforms (YouTube, Facebook and Twitter).

Methods: Video analytic data was collected between August 2016 to January 2017 from the OPENPediatrics website and OPENPediatrics YouTube channel for 296 videos. A total of 2,210 lifetime video comments were compiled, coded, and thematically analyzed from the OPENPediatrics website and YouTube channel. User analytic data from the OPENPediatrics Facebook and Twitter accounts were collected for the same time period.

Results: OPENPediatrics YouTube channel had ten times the number of video views overall. However, there was less overall viewer retention with and commenting on the videos on the OPENPediatrics YouTube channel compared to the OPENPediatrics website. Viewers watched videos twice as long on average on the OPENPediatrics website. There were more video comments made on the OPENPediatrics website than the YouTube channel (1,941 vs 269). Notably, the majority of video comments (70.7%) on the OPENPediatrics website were based in discussion. In contrast, the majority of the YouTube video comments (58.2%) were laudatory. Less than five percent of users that viewed daily OPENPediatrics Facebook or Twitter posts also engaged by commenting, liking, or sharing the content.

Conclusions: Engagement with medical education content differed between the clinician-only OPENPediatrics website and OPENPediatrics social media platforms. This data suggests that public social media platforms may be better for attracting greater viewership of medical education videos, while clinician-only platforms may be better suited for fostering discussion and community.

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I. Glossary of abbreviations

OP = OPENPediatrics

CoP = Community of Practice

FOAM = Free Open Access Medical education

WSP = World Shared Practice Forum

Background

The advancement of evidence-based medicine and data-driven decision-making has required the practicing physician to learn, store and retrieve an ever-increasing amount of information¹. This proves most challenging in the primary care field and research-dominated specialties like oncology where time constraints and volume of information can be significant barriers to efficiently addressing clinical questions with evidence-based resources. In particular, general practitioners have the challenge of reducing the amount of time needed to search for information while ensuring that they are able to find an answer based in evidence². Thus, a new model of learning is needed to more easily facilitate a streamlined and focused means of learning as physicians are expected to amass and recall more medical knowledge.

Traditionally, with foundations in social cognitive theory, one of the modes through which physicians and physician-trainees have learned is through apprenticeship in addition to interactions with colleagues and their environment³. For health care professionals, these connections and networks of learning often center around communities of practice within their hospitals or within broader regions facilitated through professional societies or associations. A community of practice is essentially a network of people who share a common interest (i.e knowledge, beliefs, values) that is developed through interactions within the network^{3,4}. In the case of medical education, trainees and physicians learn through interacting with their colleagues daily as part of their community of practice. Furthermore, technologies including social media have arisen that can improve this networking and collaboration and ultimately enhance learning.

The advent of social media, including popular social networking sites like Myspace and Facebook, sparked educators to contemplate “Web 2.0”, the user-centric web technologies that allow for collaborative creation and editing of content, and its role and potential impact on medical education⁵. Web 1.0 was formerly characterized by static websites created and managed by single-users, like online encyclopedias, that exploited the knowledge of a few. In contrast Web 2.0 has active websites that are constantly changing based on users and being informed by the knowledge of many, example Wikipedia and YouTube⁵. Social media as a part of Web 2.0 comprises a number of different forms like social networking sites, microblogs, blogs, wikis and video sharing tools⁶. Given the variety of platforms, ability for users to contribute and obtain information on these platforms and connect with fellow users, social media may be a good place for clinicians to obtain medical education and foster professional community. In fact, there has been an open access movement called Free Open Access Medical education (FOAM), pushing for the publishing of medical education content on freely accessible platforms like social media that can foster a globally interactive community⁷.

However, the utilization of social media for medical education has created a realm of new questions. For instance, where does content published to social media fall in the context of medical journals? Is collective critique sufficient for maintaining accurate dissemination of information? Groups are currently working to develop metrics like appraisal scores to evaluate online education resources and assess the impact of social media similar to impact factors for journals^{8,9}. Medical educators across different specialties are evaluating existing content online. Specifically exams and techniques have been assessed on YouTube for quality of the material through systematic review. Thus far, medical education videos on YouTube have been found to be of variable quality^{10,11}. With new questions and problems such as these arising with the advent of the use of social media in medical education, more research will be key in informing the literature on best practices for the publishing of online medical education content.

Introduction

There has been an explosion in the development of online medical education resources, and along with that a need to identify appropriate platforms by which to share and disseminate these resources. Increasingly, healthcare professionals are turning to social media-based platforms including YouTube, Facebook, Twitter, and blogs for the purpose of dissemination. Social media platforms facilitate broad scale interaction characterized by user-created content targeted towards fellow users. These platforms are easily accessible, allowing learners to engage with openly available cross-cultural content and resources to which they may have otherwise been limited¹². Social media platforms are designed to promote collaboration and efficient exchange of knowledge through social networks¹, and, as a result, have been heralded as a means to stimulate interaction between users, promote learner-generated content and foster active learning.

McGowan et al. found that many physicians have adopted social media, with 61% of survey respondents using social media weekly to explore online medical information¹. However, other studies have reported that clinicians are hesitant to utilize public platforms and social media for academic endeavors, questioning academic reliability and link to unprofessional behaviors^{5,13}. Many also question the authority of individuals participating in the collective editing and editorializing of public resources⁵. An additional reason for limited social media use amongst clinicians is that once a user posts information to social media, it is accessible to the global audience for an unidentifiable period of time, potentially putting at risk patient safety and confidentiality, the doctor-patient relationship, and professional/personal identity¹⁴⁻¹⁶. One potential negative effect of these perceptions is that, as illustrated in the literature, clinicians and other online video viewers comment infrequently^{17,18}. This may prove problematic as it is essential that consumers of online medical education content engage with educational material through

discussion and critical appraisal to maintain quality and accuracy in this new era of rapid dissemination of information via social media platforms¹⁹.

Clinician-targeted private platforms may be more effective in engaging health care professionals in online medical education discussions. Data suggests physicians are more likely to be users of private forums such as physician-only online communities over open social media platforms for the exchange of medical information¹. Physicians may use online communities to consult with colleagues regarding patient or professional problems or as a social means of communication²⁰. In online communities, trust-promoting factors like credentials are often identified allowing users to better assess reliability of content. Furthermore, given the security of these platforms, there is less concern for breaches of patient or physician privacy. Unfortunately, the major downside of private platforms is the restricted access and thus less readily accessible content.

OPENPediatrics (www.OPENPediatrics.org) is a web-based social learning platform upon which clinicians can access peer-reviewed content, including didactic and procedural videos, for the education of health care professionals. OPENPediatrics utilizes a clinician-only web-based platform as well as a YouTube channel, Facebook page, and Twitter handle to publish medical education content. Thus, OPENPediatrics is uniquely poised to be able to study clinician behaviors when using a private versus freely open platform for health care professional education. The goal of this report was to investigate user engagement with medical education content on the private OPENPediatrics website compared to engagement with the same content on the OPENPediatrics social media, hypothesizing that user behavior would differ between the platforms. The assessment of engagement with medical education content on social media in comparison to engagement on a dedicated medical education website in this work will inform the literature on best practices for the publishing of online medical education content, which has not yet been studied in this new realm of medical education.

Student Role

The author developed the idea of comparing clinician engagement with content on the OPENPediatrics website and social media, which was further refined with the help of his mentor, Traci Wolbrink. The author collected and analyzed user analytic data from the OPENPediatrics Facebook and Twitter social media accounts, and the video-viewing analytics for 296 videos published on the OPENPediatrics platform and YouTube. The author collected, coded, and thematically analyzed 2210 comments responding to videos posted to the OPENPediatrics website and YouTube. Dennis Daniel, MD facilitated data retrieval from the OPENPediatrics website including user demographics that were subsequently interpreted by the author. The author drafted this scholarly report and also drafted a manuscript based on this work that was submitted for publication to a medical education journal.

Methods

Engagement metrics help to identify the extent to which and the frequency with which users are interacting with online content. Engagement on online video sharing platforms can be measured via two realms: viewer retention and viewer action. Viewer retention comprises the time a user spends watching a portion or all of a video. An assessment of viewer retention can be made via the metrics of video view duration and the percentage of video watched per view. Viewer action refers to users actively engaging with online content by responding to it through a comment or clicking a button (i.e. like or dislike) that indicates their feeling towards the content. Viewer action metrics on social media sites are often evaluated through the parameters comments, likes, dislikes, and shares.

Video viewership data was collected for 296 videos on the private OPENPediatrics website and the OPENPediatrics YouTube channel between August 2016 and January 2017. This six-month period was chosen because OPENPediatrics launched an updated version of its website in August 2016 with site analytic capabilities more closely aligned with YouTube analytics to allow more similar comparison between the sites. The total number of video views and watch time for each video were reported by JWPlayer (New York, New York) on the OPENPediatrics website, and by YouTube analytics (San Bruno, California) on the OPENPediatrics YouTube channel. Viewing duration on each platform was compared using paired t-tests. Data were analyzed using Microsoft Excel 2013 (Microsoft Corporation, Redmond, Washington).

Video comments from March 2015 through January 2017 were extracted from the OPENPediatrics site and YouTube Channel. As clinicians and other online video viewers comment infrequently on medical education sites, we chose a longer study period to capture all available video comments and produce a larger sample for analysis. For the purpose of thematic analysis, comments were coded and grouped according to the following categories: discussion, clarifying question, suggestion/feedback, praise, criticism, report of technical problem, OPENPediatrics/speaker response and other (spam, emotional response, request for medical advice).

In addition to the OPENPediatrics website and YouTube Channel, OPENPediatrics has a social media presence on various platforms including, Facebook, Twitter, and LinkedIn, and presents its users daily with content promoting and highlighting its medical education content. Social media users that receive daily OPENPediatrics content are followers/subscribers of the OPENPediatrics accounts, and are also able to comment/reply, like, dislike and share/retweet the OPENPediatrics posted content once viewed. Engagement on Facebook and Twitter was measured by assessing the number of users that viewed the daily posts and their subsequent engagement actions in response to the postings. Viewer action metrics including number of comments/replies, clicks, likes, dislikes, and shares/retweets were collected via Facebook and Twitter Analytics from August 2016 to January 2017. LinkedIn, however, no

longer provides page analytics and thus was not included in this analysis.

Results

Video view duration and the percentage of video watched per view for 296 videos published to both the OPENPediatrics platform and YouTube channel are shown in Table 1. Despite the OPENPediatrics YouTube channel having ten times the number video views overall (224,298 vs 21,185 views), there was less viewer retention on the OPENPediatrics YouTube channel compared to the OPENPediatrics website. Video viewers on average watched twice as many minutes (8 vs 4 minutes) and nearly twice the percentage of each video (41% vs 23%) on the OPENPediatrics website compared to the YouTube site. This pattern remained consistent even when delineating the videos based on type including didactic, procedural and the World Shared Practice Forum (WSP) series. The WSP series is a monthly video series in which an expert physician or nurse in the field discusses a topic pertinent to critical care practice, in which two to five discussion questions pertinent to clinical practice are interspersed, aimed at promoting the exchange of ideas between physicians globally²¹. Of note, the average view duration in minutes remained similar across type of video; however, because the average length of the WSP is double that of the average procedural and didactic video length, this resulted in double the percentage of video viewed of the procedural and didactic videos compared to the WSP series.

There were 1,941 lifetime video comments on the OPENPediatrics website and 269 on the OP YouTube channel. The comments were coded and grouped according to their content for thematic analysis (Table 2). The majority of video comments on the OPENPediatrics website were based in discussion, sharing practices from other institutions and answering probing questions from the videos. In contrast, the majority of the YouTube video comments were laudatory, thanking the speakers for their lectures and remarking on the content and production. The majority of comments on the OPENPediatrics site were made on the WSP videos, which is not surprising given the goal of the WSP series is to stimulate active discussion. 1,445 comments were left on the OPENPediatrics website WSP videos, and three comments were left on the YouTube channel. The majority of comments (87%) on the OPENPediatrics website were discussing the questions posed. All comments associated with YouTube WSP videos were praise comments.

Attending physicians/consultants made up the largest group of commenters (199/394), leaving 60% (1,156/1,941) of the comments on the OPENPediatrics website (Table 3). The number of comments left by fellows, residents and nurses respectively followed the number of comments produced by attending physicians/consultants. The most comments left by one user, an attending physician/consultant, were 119. Excluding anonymous and OPENPediatrics technical support, 49% (190/390) of users commented more than once.

In addition to commenting, viewers of OPENPediatrics medical education content can demonstrate engagement with material through comments/replies, clicks, likes, dislikes, and shares/retweets on YouTube, Facebook and Twitter. The OPENPediatrics YouTube channel had 4697 subscribers, and over its lifetime, the videos have gained 3,176 likes, 149 dislikes, and 4,838 shares. Content is not delivered daily to this platform, which differs from Facebook and Twitter where daily posts or tweets are created by the OPENPediatrics team. The OPENPediatrics Facebook page has a total of 1646 likes by followers/subscribers. On average our content reaches 516 unique users daily but only 9 users actively promote the OP Facebook page daily by liking, commenting on, or sharing one of our posts. Similarly, our Twitter account has 705 followers. On average our tweets reach 225 users daily, but there are only 2 engagements daily, where a user has retweeted, clicked a link, replied or liked a tweet. Overall, less than five percent of users that view the daily content posted to our social media subsequently engage through comments/replies, clicks, likes, dislikes, and shares/retweets.

Discussion

In this report, we have described that clinician video viewing behaviors differ greatly between a private clinician site and a public YouTube channel. Although there were more views associated with the YouTube channel, viewers watched videos for a longer duration, and also commented more on the OPENPediatrics website. Furthermore, the majority of comments on the OPENPediatrics website were based in discussing the content presented, in contrast to the YouTube video comments that were primarily laudatory. We also identified that despite daily delivery of content to the OPENPediatrics social media sites, few users regularly engage in social media.

The average view duration of four minutes on the OPENPediatrics YouTube channel is similar to a report by Topps et al. which studied 15 procedural medical education videos that averaged approximately 3 minutes in length¹⁸. The videos analyzed by Topps et al. scored on average a 4.33/5 on a YouTube attention score that measured a video's ability to hold a viewer's attention in comparison to videos of similar length on YouTube, which on average scored a 3.3/5. Notably, this metric is a relative measure in contrast to the absolute video metrics of viewer duration and percentage of video viewed utilized in this study. Average view duration across all of our videos, whether procedural, didactic or WSP was 4 minutes on YouTube, suggesting that the optimal length for delivering medical education content on this platform. Nonetheless, on the OPENPediatrics website, viewer duration was double this length of time, suggesting that there was greater viewer retention on this private-clinician platform.

Many more clinicians watched videos than actively engaged with the content through commenting, and a select few of the users were responsible for the majority of the comments. This is in direct alignment with several studies that report physicians review and seek specific medical information

via social media more than they contribute to medical knowledge¹. Supporting this in a review of studies about social media virtual communities, Rolls et al reported that commenting is often performed by a small group of engaged users. 28-46% of virtual community members could be classified as “lurkers” or individuals that do not contribute actively to the community, though may be active consumers of material posted⁶. Topps et al also describes a commenting ratio of less than 1 in 2,300 viewers adding comments on YouTube for clinical training videos¹⁸.

However, several studies have described significant clinician engagement with social media. The Academic Life in Emergency Medicine held a Medical Education in Cases series with weeklong discussions moderated on its website and twitter with a similar number of both tweets and comments to the website²². They suggested that the moderator had a significant effect on spurring engagement in the twitter chats. This is similar to an international urology club that successfully held a journal club via Twitter with an average of 39 participants per month, utilizing a moderator posting key questions about the readings with prizes awarded for best tweet to promote engagement²³. Another key component to active engagement, is determining if the active engagement also furthers the collective knowledge. Rolls et al suggests that often commenting behavior on social platforms includes non-evaluative and potentially casual remarks, and rarely includes comments related to the medical content⁶. In this study, the majority of comments on the OPENPediatrics website were on-topic, contributing to the conversation/discussion, which was not the case on YouTube where the majority of comments were laudatory.

Moderation of discussion through interspersed questions was likely what encouraged active participation in the WSP series on the OPENPediatrics website. Yet, interestingly, this active behavior was not identified for the same videos with questions on the YouTube site. Thus, factors other than just moderation contributed to engagement. One factor is that YouTube is not promoted as a place for the exchange of medical ideas and thus users may not expect active participation or discussion on this platform²⁴. In contrast, the WSP series on the OPENPediatrics website was designed to promote international discussions centered around a given topic. Another factor is that what appears to be a common thread to the success of these social media efforts in achieving active engagement is essentially developing a community on these social platforms. By bringing together a group of clinicians regularly via a social platform to discuss the practice of medicine, the aforementioned studies created communities of practice similar to the in-person journal clubs or informal conferences typical to health care professions²⁵. Communities of practice are based in and have been demonstrated to promote interactions, in this case comments and tweets, as means of sharing knowledge and experience between participants²¹.

Although there were less comments, YouTube did prove to be an effective way to disseminate medical information, achieving ten times the number of video views than the private site. Similarly, Topps et al noted over 100 times as many views on YouTube than on a medical education website

dedicated to their video series¹⁸. One of the reasons that evaluating user engagement and commenting behaviors is so important, is that posting medical education content to a public site is not peer-reviewed, and thus it is important for users to have an opportunity to critically appraise medicine content. In the Web 2.0 era, where users generate content for other users, it is critical to draw from the greater intelligence of the collective to ensure dissemination of accurate information⁵. As demonstrated in an investigation of the accuracy of science entries on Wikipedia in comparison to the encyclopedia Britannica, collective editing can be comparable to professional editing²⁶. This is an area that will warrant future work to determine how best to designate medical content as “accurate”.

One important limitation of this work is the anonymity of YouTube users. We cannot determine whether the viewers and commenters are healthcare professionals or lay people. Given the academic medical nature of the content and the fact that OPENPediatrics is advertised as a clinician site, this work likely captures and describes behaviors of at least some clinicians. Additionally, in order to leave a comment on either the OPENPediatrics or YouTube sites, users must be logged in. This ties the user’s comment to their OPENPediatrics or YouTube profile, affecting their online reputation and credibility. A study of Wikipedia also suggests that registered users make more trustworthy, high quality contributions to educational platform in comparison to anonymous users²⁷. An additional limitation is that it is difficult to compare viewership results to other medical education websites, as no standardized metrics currently exist to benchmark user engagement of online platforms. In this paper, we utilized both user retention and user action metrics as reported in other studies to describe video and social media engagement.

Conclusion

In the era of growing opportunities for delivering medical education content to health care professionals, one must first consider the goals of the content to appropriately choose the optimal platform. If the goal is to simply disseminate information, social media platforms like YouTube are an easy and free way to deliver resources online. This type of platform could prove easy to utilize in a blended learning model or “flipped classroom”. However, if the educator’s goal is to foster communication and/or develop a community of practice, closed, clinician-only sites may be the better option as clinicians are less likely to engage on public sites. An ideal clinician community site must address concerns of trust, academic rigor and confidentiality by being secure, easy to navigate, well-resourced and peer-reviewed. These clinician sites may also utilize social media platforms to extend and expand its reach and availability.

Future research aims will include better understanding the factors (including psychological and technical) limiting user engagement with medical education content, both on clinician-only and public sites. We will also aim to continue to establish standard metrics to assess engagement with online medical

education content and investigate which platforms are optimized to host particular content such as a video series or journal club.

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Figures

Table 1 – Video viewing data for all 296 full-length videos on the OPENPediatrics website and YouTube from August 2016 – January 2017.

	OPENPediatrics	YouTube	p-value
All Videos (296 videos)			
Average video length (min)	22	22	
Total number of views	21,185	224,298	
Average number of views per video	71	760	
Average number of views per month per video	14	131	
Average view duration (min)	8	4	<0.001
Average % of video viewed	41%	23%	<0.001
World Shared Practice Forum (51 videos)			
Average video length (min)	37	37	
Average view duration (min)	9	5	<0.001
Average % of video viewed	25%	13%	<0.001
Procedural Videos (43 videos)			
Average video length (min)	16	16	
Average view duration (min)	8	4	<0.001
Average % of video viewed	52%	26%	<0.001
Didactic Videos (202 videos)			
Average video length (min)	19	19	
Average view duration (min)	7	4	<0.001
Average % of video viewed	42%	26%	<0.001

Table 2- Distribution of user comments for WSPs published on the OPENPediatrics website categorized by thematic analysis

Category	Example	OPENPediatrics n(%) N =1,941	YouTube n(%) N = 269
Discussion	"Yes. Sometimes we use it as rescue therapy..."	1373 (70.7)	3 (1.1)
Praise	"The video is excellent..."	214 (11.0)	158 (58.2)
OPENPediatrics Team Response	"In response to your question, Dr. Wolbrink replies..."	161 (8.3)	38 (13.9)
Clarifying Question	"Do you use hypertonic saline or mannitol?"	118 (6.1)	15 (5.1)
Suggestions/Feedback	"Could you provide us with similar recommendations..."	54 (2.8)	16 (5.9)
Technology Troubleshooting	"Error has occurred; cannot play video"	17 (0.9)	7 (2.6)
Other	SPAM, Advice, Criticism, Emotional response	4 (0.2)	32 (13.2)

Table 3 – Number of users and comments on the OPENPediatrics website by profession from March 2015 through January 2017

Profession	Number of users n(%) N=394	Number of comments n(%) N=1941
Attending/Consultant	204 (52)	1156 (60)
Fellow	31 (8)	164 (8)
Resident/Registrar	54 (14)	128 (7)
Medical Student	4 (1)	5 (<1)
Nurse	33 (8)	113 (6)
Nurse Practitioner	3 (1)	3 (<1)
Physician Assistant	6 (2)	9 (<1)
Respiratory Therapist	9 (2)	33 (2)
Other Healthcare Professional	33 (8)	117 (6)
Occupation not listed	17 (4)	213 (11)