

Dissemination 2.0: Bench, Bedside, and Beyond

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Abstract

A critical component of any research study is the presentation and dissemination of findings. Traditionally, this has been the role of peer-reviewed journals or other print publications, as well as conference presentations and posters -- all platforms with limited accessibility to the very people most likely to benefit from those findings, including practitioners and the public at large. Considering that the impact of a study's results is largely dependent on how effectively those results are disseminated, the use of faster, cheaper, and broader means for dissemination is a growing trend. Not only have journal publishers long been using social media and other technologies to disseminate their current contents, but research institutions and individual researchers themselves are increasingly promoting and discussing their work and the work of others via Twitter and other social media outlets as well. Additionally, a growing number of platforms developed specifically for this purpose are available to scientists, including ResearchGate, PubPeer, and Academia.edu. This article will examine some of the research related to the impact of these and other online tools in the dissemination of scientific information, as well as discuss some of the caveats and best practices to consider when determining which, or whether, to use more informal platforms for the sharing of research findings and other scientific information.

Keywords

Dissemination, Social Media

Introduction

A critical component of any research study is the presentation and dissemination of findings. Traditionally, this has been the role of peer-reviewed journals and other publications, typically accessible only to subscribers (individuals, institutions, libraries), and conference presentations and

posters, often seen only by fellow conference attendees or in a collection of abstracts presented in a published proceedings.

Considering that the impact of a study's results is largely dependent on how effectively those results are disseminated, using faster, cheaper, more engaging, and more efficient means for dissemination, like multi-media and social media platforms – *Dissemination 2.0* – is an exciting idea.

The role of libraries and librarians in research dissemination used to largely involve waiting for our users to come to us to ask for something. Then we would go find the thing, and perhaps a few related things, and pass those along, ending the interaction. These days, however, many of us, particularly those of us in smaller, academic, special libraries, are noticing fewer and fewer reference requests with every passing year. Our users are not coming to us for access to information anymore; where are they going? Are they going to PubMed? PsycINFO? Are they using Google Scholar?

As it turns out, for many people seeking health and related information these days, the answer is: none of the above! A survey done in 2013 (Blinkx, 2013) found that 40% of people aged 18-34 don't even search Internet search engines like Google for information anymore, including health information, they search social media. In fact, the second most-searched site on the web is YouTube.

You know what you don't find in YouTube? PubMed results.

Social media platforms are being used to disseminate study results not just to scientists and health professionals, but also to community treatment personnel, who often lack easy access to journals and conferences, and to the general public of patients, clients, and family members, who often have *no* access to those things. Why are these good platforms for them? Because these are the platforms they are already using.

Also using social media is a population particularly relevant in the mental health and substance use fields: policy makers. There is a lot going on at the policy level these days related to mental health, parity, integration with primary care, marijuana legalization, and more. And the majority of policy makers in the United States are fairly active social media users. A 2015 study (Kapp, Hensel, & Schnoring, 2015) analyzed all the federal health policy makers – people actively involved in writing health legislation on various congressional and other committees – and found that 95-100% of those people had Twitter accounts. They were tweeting

anywhere from 184-14,800 tweets each over the lifetime of their accounts, they followed anywhere from 1 to 47,000 other accounts, and had attracted anywhere from 959 to 514,000 followers. Each!

Community providers, clients, family members, even policy makers: these are people who, by and large, do not have access to traditional dissemination routes, even if they happen to know about these routes in the first place. They don't subscribe to journals. They don't go to conferences. Yet participation in their own or a family member's healthcare decision-making is a growing trend. Empowering people to be more involved in those kinds of care decisions is part of the new Patient Centered Approach to health care, an approach increasingly integral to modern medicine.

The old catchphrases like “bench to bedside” or “bridging the gap between research and practice” used to refer to dissemination of information from researchers to providers. But these days, it's more accurate to look at it as dissemination from researchers to providers *and* patients, families, and the public, all of whom have and want to have more and more agency over their health-related decision-making.

Since these groups are already using social media and other informal platforms to find health information, rather than trying to push them back to the more traditional services in *our* comfort zones (like databases), proactive librarians and information specialists should start thinking about how we can make the health information they're already finding better.

A study by Metzger and colleagues (Metzger & Flanagan, 2011) can help provide us with some simple guidelines to do exactly that. They found that the information likely to get the most attention from users is information that is easily and quickly able to be judged on three criteria: accessibility, relevance, and credibility. The more we can do to facilitate those speedy determinations, the more attention will be paid to the information we are disseminating. Let's look at those three more closely:

Accessibility doesn't just mean full-text copies of articles; in fact, for some people, that isn't helpful at all. It also means being understandable, which is where a well-crafted blog or Facebook post can come into play. Different platforms are relevant to different user groups, and so are different writing styles and levels of information presented. The most important detail about a study from a researcher or clinician's perspective is likely to be different from that of a parent, for example.

Accessibility also means being heard over that incredible glut of noise that is modern day Internet information. If people don't see or can't find your information, your information is not really accessible, right?

Relevance and credibility are also kind of about noise, too. The Internet is massive, with millions of sources constantly trying to shout out each other for attention. Given that constant racket, the user has to be able to quickly and accurately determine: is this relevant to me and can I believe it?

Keeping these three criteria in mind, let's examine some of the newer or more unique Dissemination 2.0 techniques and platforms.

Journal-based dissemination tools

Journal publishers have been using blogs and social media themselves for quite some time now. But one thing they're doing these days that a lot of us librarians or information specialists should be doing instead (or at least in addition to) is teaching and encouraging authors how to promote their own work.

For example, most of the major publishers now offer detailed toolkits for authors that include a variety of tips on promoting their work, from writing titles and abstracts that are optimized for search engines, to wording tweets in the most effective way. Authors promoting their work is good for the publishers' bottom line, of course, but it can help information get past the cost barrier created by those same publishers, by pushing

the core points, if not some version of the paper itself, directly to people who need it.

Even more interesting from a new media perspective are the multi-media products that publishers are now encouraging authors to create and submit along with their papers: AudioSlides, video abstracts, and graphical abstracts.

These products hit all three of the Dissemination 2.0 targets too: they're accessible in that they're free not just to subscribers but to everyone; they are usually around 3-5 minutes long, which also helps to quickly convey relevance or non-relevance to the user; and the information is easily judged to be credible not just because it is on the page of a reputable journal, but because it is the author talking about their own work, the author sharing their own work, the person who knows the most about it and, frankly, cares the most about it, telling you exactly why you should care too.

AudioSlides

AudioSlides are essentially mini-webinars about an article, typically made out of PowerPoint slides with recorded narration. Elsevier is a big proponent of AudioSlides and even offers a free online tool for authors to use to create them. The resultant video is available for the public to view, and typically is used to provide a sort of "in a nutshell" overview of the paper's purpose, results, and relevance to the field.

Other publishers allow authors to submit AudioSlides as well, and even without the Elsevier tool, they're extremely easy to make simply using PowerPoint. You can record narration for each slide using PowerPoint's built-in "record audio" feature, even importing music or video clips. Save your file as a video instead of a standard slide deck and you're done. The final file can be embedded in a blog post, uploaded to YouTube or Facebook, linked to from your Twitter feed, etc.

Video abstracts

Video abstracts are another promotional product being used more and more to publicize articles. These are different from

AudioSlides in that they typically use little or no on-screen text and instead focus on the author talking into a camera, sometimes coupled with animation, embedded charts, or other visuals.

The *Journal of Visualized Experiments (JoVE)*, launched in 2007, provides one of the earliest examples of video abstracts. In fact, *JoVE* markets itself as a “peer-reviewed video journal,” which is a pretty unique concept. They embed a professionally-produced video alongside each traditional full-text article on their site, documenting the experimental method used, and featuring a video interview with the author describing the study and its relevance.

Making a video abstract can be as simple as using your smartphone to record yourself talking in your office, or as complicated as a professionally-edited *JoVE* example. For something in between, a quick Google search turns up tons of free or cheap software applications that let you edit videos, add music, credits, splice in graphics, and all kinds of other fancier tricks. All it really takes is someone talking into a camera about something that matters to them, and suddenly that thing takes on an added level of interest or relevance to the user as well.

Graphical abstracts

Graphical abstracts might be the easiest way to get started. They’re a simple still image that typically presents the results of the paper in a visual format. They don’t usually work alone, like AudioSlides or video abstracts, but instead are presented alongside the text abstract.

These can be easily made using PowerPoint too; you don’t need fancy graphic software like Photoshop. You can create a slide that has your data graph on it, or some other descriptive element, add circles, arrows, or other shapes or objects, and then save the slide as an image file like a JPG.

While AudioSlides and video or graphical abstracts may be fairly easy to create, they still require extra time and effort. That leads to the obvious next question: are they worth doing?

While there haven’t been a lot of studies on the impact of these tools yet, a 2013 analysis (Spicer, 2014) looked at video abstract usage data for the *New Journal of Physics*, tracking stats for video abstracts on the *NJP* site and also on YouTube for *NJP* articles. It found that the top 25 and top 100 most-read articles had a significantly higher presence of video abstracts than articles overall in the data set. That seems promising.

We also know from research on instructional design that brains learn better when information comes into them via multiple sensory input channels (Mayer & Moreno, 2003), which means that adding visuals or audio to plain text is almost always helpful. Replace some plain-text bullet points with something that engages a different part of the brain, employing the ears as well as the eyes, e.g., and you spread out that brain’s capacity to take in and retain the information.

Social Media Platforms

As librarians and information specialists, we can help researchers promote their work by telling them about and helping them use new multi-media products, and by promoting research our staff publish ourselves, on behalf of our institutions or libraries or organizations. We can also – and should also! – be teaching them how to do it themselves.

In terms of the various social media platforms used for research dissemination, many of us already know about and are using the most prominent ones like blogs, Facebook, and Twitter, and we already know these are effective for dissemination, especially if they are used together. Two studies of the impact of those tools on article downloads found that blogging plus release on Facebook, Twitter or another platform increased the number of clicks on a paper (Allen, Stanton, Di Pietro, & Moseley, 2013; Shema, Bar-Ilan, & Thelwall, 2012).

Not only can we help educate our staff and patrons about the use of the major platforms like Facebook and Twitter, but there are also several newer platforms specifically designed for researchers to use to connect to and

network with others in their fields or related fields all over the world. These may be an even better place for researchers unused to digital dissemination to begin getting involved, as they have lower barriers, particularly in terms of time requirements, compared to applications like Twitter, which require frequent updating and carefully crafted messages.

The most popular of these research-focused social media platforms appears to be ResearchGate, which is kind of like LinkedIn for science. Users create profiles using their real identities and fill in detailed information about their specialties and interests. You can post citations or pre-print or open access full-text versions of your papers (depending, of course, on publisher restrictions), participate in discussion forums, and network with others in your field or beyond.

In a survey of 3000 scientists and engineers published in *Nature* in 2014 (Van Noorden, 2014), more than half the participants reported using ResearchGate “regularly,” beating out every other social media and research-profiling site except for Google Scholar.

Academia.edu is a similar platform, and a PLoS ONE study (Niyazov et al., 2016) compared papers from the same journal and found that a paper uploaded to their site received 16% more citations in a year than a similar one not online at all. Over 5 years, that number was 69%. It also found that articles posted to Academia.edu had 58% more citations over 5 years than articles only posted to venues like personal or departmental home pages.

On the other hand, Academia.edu has also gotten into some legal trouble, worth mentioning here because it impacted individual scientists as well as the network itself. In 2013, Academia.edu was sued by Elsevier for allowing researchers to post thousands of copyright-protected post-print journal articles in downloadable format on their profiles. Elsevier sent take-down notices both to the platform *and* to the individual researchers, something that triggered a backlash among many of the scientists, who

angrily declared Elsevier to be “unrepentant enemies of science” (Taylor, 2013).

When teaching your staff how to use these various sites, then, it is important to also educate them on what is and isn’t legally allowed in terms of posting full-text articles.

Many publishers, for example, allow for pre-print (manuscript) versions of papers to be uploaded onto institutional websites or into repositories, where they can be shared with the world at large, and those are outlets worth exploring when it comes to dissemination too. (A great database that can be used to figure out which publishers allow what, by the way, is the SHERPA/RoMEO system:

<http://www.sherpa.ac.uk/romeo/index.php>.)

Copyright questions aren’t the only thing we can help our staff navigate as they start using these tools, though. There are also some valid concerns related to the use of informal platforms to share formal information, not just because the risk of misinformation is high, but also because increasing your visibility can make you a target for criticism as well as praise.

This is an issue the platform PubPeer has had some major issues with. In fact, that platform has been so controversial at times in this way that it has spawned a whole new buzzword: “Vigilante science.”

PubPeer is a social media site that markets itself as an “online journal club.” It can only be used by published authors; to sign up, you have to provide the DOI for your published paper and be verified as one of the authors of said paper. But once you’re on there, you can set up an anonymous account and post anonymously.

The site is mostly focused on “post-print” or post-publication peer review: scientists talking about papers that have been published. Twitter is also frequently used this way, by the way. For both platforms, the ability of a user to be completely anonymized seems to be a driving factor in the risk of aggressive or angry backlash to a comment or even an individual or research project as a whole. On Twitter, those anonymous comments could be from anyone, but on PubPeer, the registration

requirements mean the anonymous comments are coming from a published author, something that seems to sometimes make the aggression worse, as some scientists have been accused of using their anonymity to sabotage the work of competitors in their field (Oransky, 2015).

However, Twitter post-print peer-review has also had some remarkable successes, demonstrating that post-print, social-media-based peer review can play a role in improving the quality of science overall. In 2012, for example, NASA gave an extremely-hyped press conference announcing the results of a study, soon to be published in *Science*, that had found that a bacteria was able to use arsenic to build its DNA. This, if true, would have been a huge discovery, with the potential to unravel most of what we thought was certain about the building blocks of life on Earth, not to mention life on other planets.

When a copy of the pre-print manuscript was added to a repository online (arXiv.org), however, scientists around the globe started digging into the methods and results, finding a lot of unanswered questions and unsubstantiated conclusions. They took to Twitter in droves to discuss it, and the hashtag #arseniclife was born, quickly becoming a sensation (Rosen, 2012). NASA pushed back. *Science* pushed back. But ultimately, a group of open-science advocates in the microbiology field attempted to replicate the original study and couldn't, providing a clear refutation of its key findings (Hayden, 2012). *Science* eventually published two papers criticizing the original study, though, to the great frustration of many in the field, they still have not formally retracted the original paper.

One of the things that made this controversy of particular interest to the information specialist and librarian fields were questions it raised about "the proper way to engage in scientific discourse." NASA in particular tried to downplay the backlash against the paper by referring to the critics as "bloggers in pajamas." But, critically, most of those bloggers and Tweeters were not commenting anonymously – and, in fact, they were largely wearing lab coats, not jammies.

What NASA failed to understand was that the "proper way" to conduct scientific discourse, as well as scientific dissemination, is constantly evolving. Frankly, the "proper" way probably ought to simply be summed up with the phrase "whatever works." As disseminators, we librarians/information specialists need to stop being so fixated on the ways in which we think people *should* access information, and instead shift our focus to the ways in which they *are already* accessing information, and try to facilitate that access by maximizing those three criteria: accessibility, relevance, and credibility.

How do we do that?

Six suggestions

1. First of all, YOU BE YOU. Your presentation of your information and your critiques of others' are only useful if they can be readily judged as credible. That means no anonymous accounts. Not only that, but you and your research staff should be as detailed as possible about your credentials, experience, and focus when setting up social media accounts.

2. Improve "accessibility" by writing clearly and simply. Consider the audience you are writing for; know who they are and what information is most useful for them. Read their posts and tweets to get a sense of their language, and then write for them, not for yourself.

3. Further facilitate confirmation of credibility by describing things concisely but completely and referencing relevant citations and sources. The goal is to make it easy for the person reading your tweet or Facebook post to assess the legitimacy of the information.

4. Monitor, moderate, and manage online discussions of the work you are disseminating. Watch for replies to your tweets or your blog or Facebook posts, and don't let misinterpretations or misinformation about the work stand uncorrected. At the same time, remain professional and reply with care and respect, as well as with accuracy.

5. Get an ORCID ID at orcid.org, and include that ID in your user profiles on

platforms so that users can quickly and reliably identify you and your other works. ORCID IDs are kind of like DOIs for people: they're permanent identifiers for individuals, particularly helpful in resolving the issues created by inconsistent author name formats in papers and databases.

6. As with most things: keep it simple. Before you post something, always think about those three criteria for information consumers: accessibility, relevance, and credibility – am I conveying these three things quickly and clearly? If not, how can I do better?

Dissemination is one of the most vital parts of science, and it is a realm in which librarians and information specialists have uniquely relevant skills. The old ways worked great for a very long time, but as technology changes, so too do our users and their needs. The Internet, social media, and other novel

communication tools, like AudioSlides and video abstracts, have massive power to enrich not just dissemination and science, but our field as well. Lean in, librarians! Now is your chance to make yourselves more relevant than ever before!

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