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Framing the Talk: Scholarship as Conversation in the Health Sciences

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Scholarship as Conversation, one of the threshold concepts in ACRL's Framework for Information Literacy for Higher Education, is and always will be an important concept for students to understand. The idea behind this frame has traditionally been introduced to students across the disciplines in the context of citing sources correctly, giving scholarly attribution, and avoiding plagiarism. These tenets are repeated in English class lectures, library orientations, as well as many other classes requiring research and writing. The Scholarship as Conversation frame continues to reflect these tenets in the knowledge practices; however, the frame has much broader implications that are crucial for students to employ as they continue their education and later when they enter their professions, such as following changes in scholarly perspectives over time on topics in their disciplines, seeking out different perspectives, and contributing to the scholarly conversation. If students fail to understand these broader implications, they are unlikely to find the idea of attribution important or meaningful.[1]

Information literacy for students in the health sciences has a particularly vital role as they acquire increasing responsibility in patient health care decisions. These students view this frame through the lens of evidence-based practice (EBP), which includes concepts such as study appraisal, clinical questioning, and understanding and applying the medical literature to health care decisions. The Framework for Information Literacy for Higher Education

(Framework)[2] offers a better correlation with EBP than perhaps the Information Literacy Competency Standards for Higher Education (Standards)[3] did, directing Information Literacy (IL) instructors to expand beyond the skills-based approach (how to cite) to teaching information literacy competencies such as citation scanning, evaluating study design, and valuing user-created content. Many librarians have already done this or have been doing it all along, but the Framework unifies efforts and offers direction in *how* to do it.

Many health sciences librarians have also been emphasizing knowledge and comprehension over the acquisition of specific information literacy skills, but Knapp and Brower challenge health sciences librarians to be more thoughtful about incorporating the Framework as a means to improve their information literacy practices.[4] In the past, the Standards did not align very well with the EBP framework. Nancy Adams compared the two and found important concepts in EBP overlooked in the previous Standards. She determined that the Standards should include less reliance on authority as indicators of quality and more emphasis on question formulation and application of knowledge.[5] Perhaps health sciences librarians felt the gulf was too wide to be able to incorporate the two. The Framework, however, offers better alignment with many of the complex issues inherent in health science information literacy instruction and provides an outline of how to teach the complexities of evaluating and using information. Knapp and Brower recommend the Medical Library Association consider best practices for using the Framework in health science instruction and the possibility of officially adopting the new Framework.[6]

In the health sciences, Scholarship as Conversation highlights the community aspect of research, as well as its evolution. The directive of this frame is to instill in students an idea, which they often do not appreciate, of research as a "discursive practice in which ideas are formulated, debated, and weighed against one another over extended periods of time."[7] In this same vein, students must learn to view their own research and writing as participation in discourse and themselves as information creators.[8]

The Framework is based on several core concepts, which are organized into six frames, as well as two additional elements: knowledge practices and dispositions. Knowledge practices are "demonstrations of ways in which learners can increase their understanding of these information literacy concepts."[9] Dispositions "describe ways in which to address the affective, attitudinal, or valuing dimension of learning."[10] The knowledge practices for this frame also include discovering the many types of scholarship that make up disciplinary knowledge. Exercises and discussion should help develop this notion that scholarship is an ongoing conversation—a conversation where students can contribute and lend their voices and opinions, not merely accept or consume. This should be in accord with the knowledge practice to "con-

tribute to scholarly conversation at an appropriate level, such as local online community, guided discussion, undergraduate research journal, conference presentation/poster session," as well as "identify barriers to entering scholarly conversation via various venues."[11] One of the Framework's dispositions identifies a barrier, requiring that students learn to "recognize that systems privilege authorities and that not having a fluency in the language and process of a discipline disempowers their ability to participate and engage."[12]

In our current society, where the public has entered many scientific conversations through blogs and social media, different types of authority are recognized by different segments of the community. In the vaccination and autism debate, scientists possess one type of authority and parents of autistic children possess another. Often, scientists communicate less effectively than advocacy groups. P.A. Offit laments the lack of communication skills of the scientific community, wishing they would do a better job of communicating theoretical risk and the difference between coincidence and causation. He states, "Once you raise the notion of a possibility of harm, it's hard for people to get that notion out of their head."[13]

Students should explore how the expansion of scholarly venues through weblogs, research repositories, and social media allow more opportunities for a larger variety of perspectives and participation, allowing students, community, and any other stakeholders to add their thoughts and opinions to the conversation.

Even if students currently lack the authority to participate in certain dialogues, we can help them develop the ability to critically evaluate the conversation and the contributions of those involved, with the understanding that they will need to eventually cross the threshold of identifying themselves as producers of knowledge, instead of just passive consumers.

Information literacy instruction at Murray State University

At Murray State University (MSU) Libraries, a four-year, public master's level institution with a recently added doctoral program in Nursing, the information literacy class evolved from a one-credit-hour, half-semester class to a three-credit-hour, full-semester class in 2010. In 2013, the MSU Libraries added an information literacy minor to the curriculum. One of the Information Literacy (INF) minor classes offered focuses on the health sciences. Some of these changes occurred alongside the ACRL's creation and adoption of the Framework. In the wake of these changes, we have been considering ways to move our information literacy instruction from teaching "library skills" in

a one-hour class to trying to develop life-long learners in a newly expanded curriculum. The shift in the information literacy design encourages building a strong scaffold for students in one-shot instruction sessions as well—one that will allow them to develop an increasingly complex relationship with information over the course of their educational and professional careers, a tall order for a one-hour spot. In an effort to reach this goal, we have been working with faculty to build a scaffold of IL instruction to try and reach these outcomes, expanding students' IL skills as they move toward graduation.

Implementing the threshold concept

In our three-hour INF 101 class, we critically examine the 1998 retracted *Lancet* article by Andrew Wakefield, which proposed a connection between autism and the measles, mumps, and rubella vaccine (MMR). The social impact of the article, as well as the comments, retraction, and citation history of the study, serve as a significant and vivid example of the influence of scholarly conversation and the sense of accountability necessary when participating in scholarly discourse. In our class, we discuss the media's role in this conversation and how it led to user-generated content, creating a great deal of social unrest. The fallout was precipitous, leading to some parents deciding against childhood vaccinations, allowing new outbreaks of diseases previously considered eliminated in the United States and Great Britain, such as measles, whooping cough, and mumps.

In our INF class, we look at retracted articles and the importance of reading critically. This lesson maps well to the Scholarship as Conversation frame because it shows one way in which scholars formally communicate about published research. There are often published conversations before an article is retracted in the form of comments, replies, and expressions of concern. Comments can be substantive articles, letters, or editorials that challenge, refute, support, or expand upon another published item. The original author may often respond to the comments. Occasionally the journal will publish an "Expression of Concern" to draw attention to possible problems. So even before blogs, Twitter, and Facebook, students can see the scholarly discourse that occurred surrounding certain retracted or disputed articles.

In class, we go over the definitions of errata, so students will have a better understanding of why an article might be retracted. The National Library of Medicine (NLM) defines errata as any correction or corrigenda for any previously published articles. NLM states that articles may be retracted or withdrawn by authors, academic or institutional sponsor, editor, or publisher because of pervasive error or unsubstantiated or irreproducible data. NLM does not remove the citation for a retracted article, but updates the citation to indicate it has been retracted and links the original citation to the citation for

the published retraction notice. Partial retractions occur when only a small part of an article needs to be corrected or removed.[14]

Class discussions include the fact that even though a scholar has conducted research and had an article published in a peer-reviewed journal, we as readers should not automatically accept it as a valid scientific study. Discussion includes coming up with the reasons why an article would be retracted, such as faulty logic or computation, accidental contamination, falsified or fabricated data, or honest error, scientific misconduct, or plagiarism. The discussion helps students understand how important it is to evaluate every article they read, regardless of the reputation of the journal that published it.

To emphasize this point, the INF students search Medline for the Wakefield article with very little or no prior knowledge of the content. They include "retracted publication" as a limit in in publication type and enter "Wakefield" as an author search and "autism" as a keyword search. Once they locate the correct citation entitled "Illeal-lymphoid-nodular hyperplasia, non-specific colitis, and pervasive developmental disorder in children,"[15] they must find the full-text of the article and answer several questions about the content of the article, such as: "What are the environmental triggers considered in the article?" and "What is the behavioral disorder under discussion in the article?" It takes careful reading to identify the answers. They must also evaluate the study design and number of children in the study, deciding whether the number of participants in the study (twelve) seems sufficient.

Another important aspect of Scholarship as Conversation is citation history or times cited. Students should develop the ability to identify key players and their perspectives on topics within their disciplines. The conversational aspect of science can also be illustrated by citation chaining and noting the number of times an article has been cited and by examining the articles that have cited it, as well as the bibliography. Students in the Nursing Leadership class often become discouraged over the lack of resources for their very narrow topics and may immediately want to change their focus. When they practice citation chaining using a citation index like Google Scholar or Web of Science, they are often relieved to discover articles they had not found previously, as well as discovering authorities on their topics and critical articles cited multiple times.

The Wakefield article has been cited in Google Scholar 2,549 times at this writing. After discussing scholarly impact in a previous class, the high citation count of the Wakefield article is a good example of negative impact. Articles can be cited because they are an example of misconduct, for example, or they can continue to be cited despite the retraction or cited without realizing it has been retracted. Budd, Sievert, and Schultz report that of 235 articles retracted during 1966–96, they were cited in total more than 2,000 times after their withdrawal with fewer than eight percent of the citations acknowledg-

ing the retraction.[16] Students often ask if it is acceptable to cite an article that is cited in another article. Citation scanning can help explain how consulting the original article can prevent problems, such as perpetuating incorrect citations, quotes, or continuing to cite articles that have been retracted.

Before searching for the Wakefield article, the class looks at "Retraction Watch" a blog first published by Ivan Oransky and Adam Marcus in 2010.[17] The purpose of the blog is to increase the transparency of the retraction process. Da Silva and Dobránszki state that retraction notices should inform the scientific community why a particular publication has been retracted and that retraction notices that don't fully explain the reasons behind a retraction serve as "a poor historical document."[18] They do not hold all parties accountable or inform the audience of the problem and reason. Da Silva and Dobránszki graph the inconsistencies across publishers and other entities regarding definitions of different errata.[19]

Do journals retract articles when a theory or evidence has been displaced? In 2005, JAMA published an article contending fetuses do not feel pain before the third trimester.[20] Newer studies propose that fetuses feel pain earlier. Howard Bauchner, Editor in Chief at *JAMA*, said the Lee et al. article should not be retracted, stating that review articles summarize the evidence available at the time "Although subsequently published reports may add to the existing evidence on a topic, or propose alternative theories, that new information does not require retraction of previous review articles. In addition there is no evidence supporting other issues that would necessitate retraction, such as fabrication or falsification."[21] This topic presents a good discussion topic for students to argue when a retraction is appropriate.

The last two questions on the homework assignment concern measles—when it was eliminated and how many cases were reported in the United States in 2015. Students learn that measles was eliminated in the United States in 2000, but because of fears surrounding the safety of the MMR vaccine, as well as fears regarding the levels of thimerosal in vaccines, there were outbreaks. In 2015, there were 189 cases of measles reported. In 2014, 667 cases were reported from twenty-seven states.[22] The majority of people who contracted measles were unvaccinated. Prior to the vaccine becoming available in 1963, three to four million cases were reported yearly in the U.S. with 450 deaths.[23] Other disease outbreaks occurred as well that were previously controlled or eliminated in the United States, including mumps, whooping cough, and Haemophilus Influenzae Type B (Hib).[24]

The fear of vaccination and the resulting return of deadly diseases shows how perceptions in scholarly thought can change over time. Sharon Kaufman draws a comparison between the "enduring belief in the vaccine-autism theory"[25] with what Ludwik Fleck calls "an event in the history of thought,"[26] a critical step in the way the perception of a scientific fact changes. In his book

Genesis and Development of a Scientific Fact, originally published in 1935, Fleck believed that scientific facts are not prior, fixed, and autonomously determinate features of an external world, but rather, "events in the history of thought." Fleck proposed that "Truth is not a convention, but rather one in historical perspective, an event in the history of thought."[27] Fleck argues that before a fact is even perceptible, "it must be in harmony with the prevailing thought style and aligned with the intellectual interest and other goals."[28] He describes the statement or belief that we call truth a "harmony of illusion," which relies on our current beliefs and experiences.[29] Scholarship as Conversation illustrates how our thoughts change as we move through different beliefs and experiences. So, once again, students must think critically to realize even science is a gray area, relying on perceptions and experiences, reluctant to change, and exists at any point in time within a "harmony of illusion."

Responsibility is a major concern of the frame, Scholarship as Conversation. "Understand the responsibility that comes with entering the conversation through participatory channels contributing to the conversation,"[30] is a disposition in this frame. In the vaccination and autism debate, the parents advocacy group, SafeMinds, promotes the idea that the thimerosal in vaccines causes autism by citing an article in *Medical Hypotheses* entitled "Autism: a novel form of mercury poisoning."[31] The journal admits that it accepts articles that are "probably untrue" and true to form; this article's theory was disproved but is still cited by advocacy groups.[32] Ludwik Fleck wrote that "there can be resistance to a prevailing thought style, only when striving for a goal."[33] In the vaccination/autism debate, the public health goal is the elimination of disease through the immunization program, now the accepted norm. The goal of autism advocacy groups, however, is discovering the cause of autism, so it can be eliminated. Both are worthy goals, but the advocacy groups, such as SafeMinds, are resistant to the prevailing thought style, believing immunization interferes with their goal of preventing autism and challenging the idea of a universal immunization program. They are entering the scholarly conversation, but in an irresponsible manner, by continuing to cite disproven theories.

Media's role in Scholarship as Conversation

We also look at the responsibility of the media and their role in the scholarly conversation in class. In the name of balance, media fuels the social media fire by giving equal time to both sides of an issue, despite potential harm through misinformation.[34] In the vaccine/autism debate, parent advocacy groups, such as Generation Rescue, arise from the fears and misinformation that media's need for balance and ratings produce. Listservs, chat rooms, blogs, and other social media perpetuate rumor and myth. Responsibility often falls away in

social media venues. Students witness this every day in their personal lives. The knowledge practice of the Scholarship as Conversation frame encourages students to "critically evaluate contributions made by others in participatory information environments."[35]

In one assignment, students find a medical news article and compare it to the original article. They are asked which is the primary and which is the secondary source. The secondary news articles are written in a much easier to understand style and will usually cite the original article. This is another opportunity to remind students to try and cite the original work whenever possible. It also allows them to see how focus or meaning can change each time we take a step away from the original study or thought.

Scholarly perceptions can change for many other reasons. Students must think critically about topics to understand different ways in which misconceptions can occur. Autism diagnoses have risen in the United States from about .47 per 1,000 children in the 1980s to about 14.6 per 1,000 in 2012, according to the CDC.[36] The media and others may look first at environmental factors for the increase, overlooking the changes in the definition of autism. The DSM-5 changed the diagnosis to include four separate disorders: autistic disorder, Asperger's disorder, childhood disintegrative disorder, or pervasive developmental disorder. This change in diagnostic criteria accounts for at least part of the increased prevalence. In a Denmark study, Hansen et al reported that these changes accounted for 60 percent of the increase in the observed prevalence of Autistic Spectrum Disorder from 1980–1991.[37] Better screening, greater parent awareness, and more health professionals trained in the diagnosis of autism may also contribute to an increase in prevalence, but whether it accounts for all of the increase is highly doubtful.[38] Students are asked to critically evaluate everything they read in class. The statistics in this case are correct and seem to indicate a tremendous increase in autism, but students must learn to consider other factors that may not be readily apparent but critical nonetheless.

Conclusion

The consequences of misconceptions or misinformation, particularly in the areas of public health, can be dire, illustrating how important responsibility is in scholarly conversation. As parents worry and abstain or delay vaccinations, public health can be threatened. Low vaccination rates in states such as Oregon, California, and Colorado become problematic, especially when vaccination rates drop critically. When the "herd immunity threshold"[39] is reached, infection spreads. Because measles is very contagious, the immunity threshold needed to protect a community is high—95 percent. Diseases like polio, which are less contagious, have a threshold of 80 to 85 percent.[40]

The vaccine/autism debate offers one example of how the conversation of scholarship can impact society. Authorities come to the forefront and then recede. Parents want desperately to protect their children and are unsure who to trust. Scientists do little to reassure them because they tend to communicate within their own narrow areas of research and do little to reach out to the broader society. Meanwhile, advocacy groups and the media bombard parents with information that is difficult to ignore.

My hope is that this course, and the lesson based on the autism/vaccination debate, will be one, small, incremental step in helping our students incorporate the knowledge practices and dispositions of the Scholarship as Conversation frame into their information literacy knowledge base. An information-literate professional can be a voice of reason in critical health debates, such as the autism/vaccination one. Students may soon have the responsibility of calming fears regarding vaccinations or other health care related issues. They may also contribute to the conversation through published articles, social media, or presenting at professional meetings.

The autism/immunization debate lesson should help students realize the importance of following changes in scholarly perspective of evidence over time, as stated in the Frame's knowledge practices. The Wakefield article was published in 1998, when many of our students were infants or not even born yet. It took thirteen years of debate before *Lancet* officially retracted the article. Following, reading, and evaluating the validity of the comments and concerns regarding the article before it was retracted illustrates the value of seeking out different perspectives and interpretations, as stated in the Frame, before students come to their own conclusions.

The Scholarship as Conversation frame offers a more expansive view of this concept and serves as a helpful guide that educators and information literacy instructors may give students a better appreciation of the discursive practice of scholarship, as well as an understanding of their roles as contributors, evaluators, and interpreters. A better comprehension of the implications of this frame will help students appreciate the importance of the traditional information literacy skills, such as attribution, but more importantly, information literate students will ultimately be better health care providers because they will be better equipped to evaluate the available information and decide for themselves the current best evidence on any topic.

Notes

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2.   Association of College and Research Libraries (ACRL), *Framework for Information*

Literacy for Higher Education, February 2, 2015, http://www.ala.org/acrl/standards/ilframework.

3. Association of College and Research Libraries (ACRL), *Information Literacy Competency Standards for Higher Education*, 2000, http://www.ala.org/acrl/standards/informationliteracycompetency.

4. Maureen Knapp and Stewart Brower, "The ACRL Framework for Information Literacy in Higher Education: Implications for Health Sciences Librarianship," *Medical Reference Services Quarterly* 33, no. 4 (2014): 467.

5. Nancy E. Adams, "A Comparison of Evidence-Based Practice and the ACRL Information Literacy Standards: Implications for Information Literacy Practice," *College & Research Libraries* 75, no. 2 (2014): 242.

6. Knapp and Brower, "The ACRL Framework for Information Literacy in Higher Education: Implications for Health Sciences Librarianship": 467.

7. ACRL, *Framework for Information Literacy for Higher Education*.

8. Carroll and Dasler, "Scholarship is a Conversation."

9. ACRL, *Framework for Information Literacy for Higher Education*, February 2, 2015, http://www.ala.org/acrl/standards/ilframework.

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11. Ibid.

12. Ibid.

13. Liza Gross, "A Broken Trust: Lessons from the Vaccine–Autism Wars," *PLoS Biology* 7, no. 5 (2009): e1000114: 6.

14. National Library of Medicine, "Errata, Retractions, Partial Retractions, Corrected and Republished Articles, Duplicate Publications, Comments (Including Author Replies), Updates, Patient Summaries, and Republished (Reprinted) Articles Policy for MEDLINE," accessed September 15, 2016, https://www.nlm.nih.gov/pubs/factsheets/errata.html.

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18. Jaime A. Teixeira da Silva and Judit Dobránszki, "Notices and Policies for Retractions, Expressions of Concern, Errata and Corrigenda: Their Importance, Content, and Context," *Science and Engineering Ethics* (2016): 1, doi:10.1007/s11948-016-9769-y.

19. Ibid.

20. Susan J. Lee et al., "Fetal Pain: A Systematic Multidisciplinary Review of the Evidence," *JAMA* 294, no. 8 (2005): 947–954.

21. Howard Bauchner, "JAMA: No Plan to Retract Article on Fetal Pain, Despite Outcry from Anti-Abortion Activists," June 15, 2016, http://retractionwatch.com/2016/06/15/jama-no-plan-to-retract-article-on-fetal-pain-despite-outcry-from-anti-abortion-activists/.

22. Centers for Disease Control and Prevention, "Measles: Cases and Outbreaks," last updated August 3, 2016, http://www.cdc.gov/measles/cases-outbreaks.html.

23. Gross, "A Broken Trust": e1000114. Fig. 2: 3.

24. Ibid, 2.

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27. Ibid, chap. 4, sect. 4, location 1971.

28. Ibid, chap. 4, sect. 4, location 963.

29. Ibid, chap. 2, sect. 3, location 233.

30. ACRL, *Framework for Information Literacy for Higher Education*.

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32. Gross, "A Broken Trust": e1000114, 3.

33. Ludwik Fleck, trans. Frederick Bradley and Thaddeus J. Trenn. *Genesis and the Development of a Scientific Fact* (Chicago: University of Chicago Press, 1979), Kindle edition, chap. 4, sect. 3, location 1985.

34. Gross, "A Broken Trust": e1000114, 6.

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