Literacy and Pedagogy in an Age of Misinformation and Disinformation
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Keeping Truth Alive: Literacy, Libraries, and Strategies in an Age of Misinformation

Nicole Allensworth

Academic librarians have long been teaching students how to evaluate information, but the information landscape has grown increasingly complex in the last several years, and our pedagogies and classroom instructional strategies have had to evolve rapidly in response.

When I earned my master's degree in library and information science in 2008, teaching college students how to evaluate information still involved the use of credibility checklists, relatively simple tools that ask students to interrogate information sources with a concise set of questions about currency, relevance, authority, accuracy, and purpose. While tools of this sort fit neatly into the short timeframes of the "one-shot" information literacy workshops academic librarians often provide, they don't quite hold up in the complex post-truth information environment students now need to dive into with every research paper. Gone are the days when the most confusing or harmful information source a student could encounter might be a biased website maintained by an advocacy organization. Now, the spectrum of misinformation begins with simple bias and ends somewhere in the bottomless pit of conspiracy bots and deepfakes.

The credibility checklist model of information literacy presents the additional problem of perpetuating socially constructed notions of authority that reproduce the language of the dominant culture (see Doherty). With my particular body and its attendant complicated privilege in the classroom, there is no straightforward way to offer such lessons by handing out a checklist, anyway. Critical information literacy studies reminds us that libraries are not neutral spaces and that my body in this space is not neutral either. I am a white, hetero, cisgender woman—but also a first-generation college graduate with the lived experience of poverty. I am an academic and a perceived gatekeeper of information and authority—but also a librarian, not a professor, and an adjunct one, at that. Knowing how complicated the culture of academia is for me, I can extend that empathy to my students, who are negotiating so much more. As Lava Asaad points out in her contribution to this collection, I can use my non-neutral stance in the classroom to my students' advantage: when I am not "performing neutrality," the truth is also not in danger of "being neutralized" and I can

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demonstrate that information or language is "never benign" in an age of fake news. Fortunately, my students' experiences in the classroom are situated in an institution with a stated mission of social justice. San Francisco State University founded the nation's first College of Ethnic Studies, and much of what we offer reflects that, or can be held to that standard when we critique or seek to change it: our curricula and our library collections, the way we teach and the way we interact with students. Many of the students themselves have come here to engage with that vision and mission of social justice. Another thing that can help further that mission is teaching with the ACRL's (Association of College and Research Libraries) Framework for Information Literacy for Higher Education. While the Framework hints at having been designed as a living and culturally responsive document in dialogue with social justice, in that it begins to acknowledge the privilege and power structures that information arises from (see, for example, the frame "Authority is Constructed and Contextual," one that I invoke regularly when teaching about both peer review and misinformation), one of its limitations is that it fails to fully articulate a vision of information social justice (as described by Saunders and others). Teaching librarians are therefore constrained by needing to use the Framework more as a set of raw materials than as a finished, sound structure. To that end, many of us employ our own frames, often tied to the #critlib movement, that help us teach ideas such as information privilege. And when teaching information privilege, misinformation, and disinformation using the Framework, many of us begin with the frame "Authority is Constructed and Contextual."

One of the things this frame and others can address is this: with the advent of social media, we have left a print-based culture and its editorial assurances far behind for a publishing model that employs algorithms, not editors, and the content of which is driven by clicks and data-mining opportunities, not journalistic/humanist values like truth, independence, fairness, and accountability. While we've always had propaganda, misinformation, and disinformation (think, the yellow journalism of the 1890s or war propaganda posters), the speed, efficiency, and ubiquity of the Web have made the spread of false information too easy, and the resulting deluge too overwhelming to navigate (yes, even for students who are masters of the meme). Add students' psychologically adaptive propensity to engage in satisficing heuristics—searching only until they find something that crosses the "good enough" threshold—to the mix, and you have a recipe for research disasters.

Our current landscape is challenging not just in the sense that the information we encounter has grown murkier and more complicated, but also in the sense that our pedagogies aren't always keeping up. Information literacy instruction is usually taught by librarians beginning in college—many budget-strapped public high schools have libraries but no librarians—and within the constraints of limited resources and existing curricula that sometimes recognize information literacy as a core competency but do not always make quite enough room for it. In the California State University system, for example, student learning outcomes focused on information literacy are infused across the baccalaureate requirements in a distributed model, with an expectation that individual courses will address these outcomes through course characteristics, activities, and assignments. Often, what this looks like in an already overburdened syllabus is a requirement that students use and cite "library resources." That's an excellent start, but, depending on the nature of the course and assignments, it might leave students without the specific skills they really need to navigate their way through the

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garbage heap of misinformation toward facts, evidence, and informed, well-reasoned opinion.

Information literacy is inherently multidisciplinary, intersecting organically with many other disciplines, including education, communication and media studies, languages and literature, computer science, and philosophy, to name a few. At the heart of that intersection is critical thinking, especially reading and writing skills that foster a critical disposition toward information. If what we are after is students who can understand and apply critical thinking processes that include reflection, analysis, synthesis and evaluation with a goal of being able to make a judgment or take an action, then we need to get multiple literacies on board, including: information literacy; media, visual and digital literacies; data, technology and "network literacies"; health and financial literacies; civic, ethical and political literacies; and, cultural and critical literacies. If we can think of information literacy teaching as interwoven with the wraparound pedagogies of metacognition, teaching for transfer, critical thinking, and writing, then we can begin to imagine ways we can help students engage with not only discipline-specific, skills-based critical literacies across all domains, but also culturally relevant multiliteracies (first described by the New London Group).

Much of this is already happening in general education courses in the sciences, social sciences, and humanities. But we need to make sure that new courses that specifically address misinformation in student learning outcomes, assignments, and activities are being developed and made available to students. To offer an example: every student now needs to understand the history, uses, and dangers of propaganda as a kind of inoculation against the misinformation they encounter daily on the Web, and there is a growing body of curricula around that. John Sellers, founder of Other 98% and the Ruckus Society, suggests that students also "probably need a unit on memes that helps them practice critically understanding memes from the inside out—not just 'getting' them but also producing them," explaining that this would help students understand the dominant narratives in our culture, as well as how to challenge them (see his interview in this collection).

Further, to become competent critical thinkers capable of transferring that knowledge across contexts, students need to understand logical fallacies (such as confirmation bias and selective attention) and the vulnerabilities those fallacies present in their relationships to information. As well, a little knowledge of digital media technologies would help students understand how technology can be used to manipulate. Joanna Geary, Director of Curation for Twitter, describes some of the new technologies as "frankly terrifying" and offers an approach informed by cognitive behavioral therapy that includes asking us to learn more about how we react to information: "It is much more about our own emotional response system than it is about information" (see her interview in this collection).

How do we know that student instruction around any of this would make a difference? Student learning assessments done at both individual and institutional levels that seek to articulate the value of academic libraries by tying classroom information literacy instruction to metrics associated with academic success, such as higher GPA and greater retention and unit completion rates, are being critiqued by thinkers in the library realm who are concerned about the pressures of neoliberalism in the academy. I share those concerns, and yet have also participated in student success assessment initiatives. One such project had me scoring student artifacts using an information literacy rubric; as I read their research papers and as I looked at the preliminary findings from all artifacts, my

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admittedly subjective thought (lacking the context of the lives these artifacts emerged from) was that students who had experienced a librarian-led information literacy workshop seemed to have a more functional, nuanced and sophisticated relationship to information. I don't necessarily trust these tools of the meritocracy: I know far too much about my students and the critical details of their lives that are missed by such tools (I'm thinking in this moment of a student who was taking a required research course for the third time and could only reach me by calling from a payphone in the shelter where he was staying). As Shereen Inayatulla and Michael T. McDonald put it in their essay on citizenship and documentation in this collection, learning outcomes, "assessment loops," and other metric-focused "deliverables" can function as gears in the machinery of cultural reproduction. What I do have faith in, though, is what I know about the individual students I work closely with: for the students who are able to attend, my presence in the classroom as a librarian instructor makes a difference to their relationships with information. In addition to bringing a librarian into the classroom, another powerful way to teach critical thinking and to get information, media, and digital literacies infused throughout a syllabus is to reach out and actively collaborate with academic librarians to develop scaffolded assignments that include steps that teach and compassionately assess information literate practices. Shannon M. Pella in this collection describes a curricular unit that teaches students to "value evidence" in part by asking them to answer "essential questions" such as "who is responsible for fact checking the news and preventing the spread of misinformation?" Teaching librarians are attempting to teach the same thing by using activities and assignments such as the following:

Four Moves and a Habit

Developed by Mike Caulfield (Washington State University at Vancouver) and based on the 2017 research of the Stanford History Education Group, Four Moves and a Habit is a set of practices that comprise a critical mindset. The four moves are practical, specific strategies that can be employed by students every time they interact with information they find online. The moves are 1) Check for previous work (use fact-checking sites); 2) Go upstream to the source (locate the original published work); 3) Read laterally (read others' perspectives on the issue); and 4) Circle back (emphasizing the recursive nature of research, this asks the student to use what they have learned in the previous moves to improve the next iteration of their search). The habit is to check emotions (because misinformation uses emotion to manipulate). Because the four moves are a mindset that informs students' ways of relating to information, they can become a context for or first step in any assignment or activity. What I particularly like about the four moves is that they teach students to interrogate the *claim* (critical thinking), not the *source* (checklist thinking).

Mind-Mapping a Topic

This structured mind-mapping exercise, which many librarians use in information literacy workshops, unpacks and maps a complex question or idea. This exercise is easy to incorporate as a scaffolded pre-research component of any research and writing assignment and can be completed in small groups or as a think-pair-share activity. I ask students to write their research topics on a

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worksheet or whiteboard, circle the words that represent the main ideas, number them Idea #1 (and so on), and then brainstorm and list as many related words as they can in each idea "bucket." These related words can be synonyms, broader/narrower terms, specific examples, thinkers/theories, news/current events, etc. The structure of this mind map allows students to identify both the explicit and implicit ideas; see the underlying conceptual framework of their topic; and shine a light on any biases or assumptions, as well as areas of knowledge ripe for deeper exploration and understanding.

Fact-check and Edit a Wikipedia Entry.

Wikipedia gets a bad rap, but it has evolved over the years by developing an organic, crowd-sourced fact-checking process. Because it is open source, students can easily participate in that process, giving them good practice with critically examining a claim, fact-checking, and verifying information. As part of this exercise, I ask students to read and discuss a Four Moves and a Habit handout first. I then ask them to create a Wikipedia account (allowing their IP addresses to remain anonymous) and locate an assignment-relevant page that interests them. Students can then click on the Talk tab of their page to choose existing issues to work on, click the Edit Source tab to edit existing sections, or click on the New Section tab to write and cite a new section. I give students a list of fact-checking websites (such as PolitiFact) they can use to verify claims and ask them to use strategies outlined in the Four Moves and a Habit handout (such as "going upstream" to the source). This works within the confines of a one-shot information literacy workshop, but the exercise can easily be scaled up in a quarter- or semester-long course by assigning readings from Mike Caulfield's free ebook, *Web Literacy for Student Fact-Checkers*, asking students to both fact-check and edit an existing page, and having them create a new page documenting their own research on a topic.

Diagram the Family Tree or Map the Journey of an Idea

This process employs Caulfield's techniques of checking for previous work, going upstream to the source, and reading laterally (also see in this collection Jennifer Hofmann, creator of the *Americans of Conscience Checklist*, who refers to lateral reading in describing her process of Googling a topic, then clicking on News, and reading the headlines of "all different kinds of papers, not just the ones I prefer"). I developed it as a way of working deeply with the ACRL frames "Authority is Constructed and Contextual," "Information Creation as a Process," and "Scholarship as Conversation." Students can be given printed exercises to do as an in-class think-pair-share activity, or they can crowdsource this exercise on a whiteboard. Handouts or whiteboard surfaces can visually depict a journey with a starting point, detours, and destination. Alternately, they can depict a family tree and/or life chronology, with birth dates, partnerships, and so on. Students can choose a published claim that is stated as fact or opinion either from a known credible source (such as a major daily newspaper) or from a dubious source (such as InfoWars or the Flat Earth Society), and scour those pages for clues or information that helps them fill in the journey or the family tree. In determining the origins of a claim (Who said this first? Who made it famous?), the "DNA" or influences embedded in that claim (Who informed this claim?), the responses to or refutations of that claim (Who says this is wrong?), and the tangents or spin-offs from that claim (Who added their own twist to this claim?), a student

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can push aside the curtain of algorithmic determinism to see a truer picture of an information ecosystem. It also gives them good practice at fact-checking (check for previous work), tracking down citations and engaging with sources, authors, and motivations (going upstream), and locating and reading other trusted perspectives on the claim (lateral reading): all important habits of mind for critical ways of knowing.

Googling Google

Adapted from assignments used broadly by many librarians, this activity exposes the inherent bias in search engine results. The exercise can be foregrounded by readings and discussions around human-machine relationships (such as the fact that algorithms are programmed by human beings with biases) as well as the fact that search engines like Google are advertising companies. Students conduct Google searches on their topics, identifying and annotating results that are paid advertisements, and then perform the same search in a different search engine that does not personalize results for a "filter bubble" experience; they then compare and contrast results. Next, students select from a list of words and phrases that describe people (such as *Muslim*, *Mexican*, *beautiful*, *strong*, and *family*) and perform an image search in Google, collecting quantitative data on their search results. For example, when searching on *strong*, students note the number of masculine-gendered images they find in the top twenty-five results, or when searching on *family*, students note the number of heteronormative images they find in the top twenty-five results. These results and the data students collect on them can become a scaffolded first milestone in a reflection paper, a think-pair-share activity, or a critical essay in which they examine what their results suggest about their topics, including which biases appear to be programmed into the algorithms; which populations seem to be stereotyped, underrepresented, or overrepresented; which perspectives are missing from these search results; and, why. This process gives students opportunities to expose and examine bias and information privilege at play in their information landscapes and to use metacognition and critical thinking skills to evaluate the contexts of information sources.

The Filter Bubble

I have been experimenting with variations on this activity since first viewing the TED Talk "Beware the Filter Bubble" and have found students to be genuinely disarmed by and interested in the results. This updated version, adapted from a lesson plan by Shaherzad Ahmadi (University of Texas at Austin), demonstrates to students how personalized algorithms that target them based on their search histories, social media, and consumer behavior—and other aspects of their digital data footprints—isolate them in cultural echo chambers or "filter bubbles." I have students watch the aforementioned TED Talk (or another TED Talk on search engine personalization) and engage with the *Wall Street Journal*'s "Blue Feed, Red Feed" tool, which shows them side-by-side comparisons of political content on Facebook from liberal and conservative perspectives. Then I ask students to use their personal mobile devices or log into their personal social media feeds and perform side-by-side searches with classmates on hot-button political issues like immigration, healthcare, guns or abortion. Students can use their results to perform a media content analysis, write reflection papers,

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or record their results and engage in think-pair-share discussions with their classmates.

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While many of us are understandably still getting our bearings around teaching in an age of misinformation, there are existing good models that we can look to. Many university libraries are offering diverse collections of vetted resources for teaching students how to deal with misinformation; two good examples are the Fake News LibGuides (research guides) created by the Dr. Martin Luther King Jr. Library at San Jose State and the J. Paul Leonard Library at San Francisco State. Loyola Marymount University Library maintains the Community of Online Research Assignments (CORA), an open educational resource (OER) treasure trove of searchable instruction materials focused on teaching information literacy, and the University of Michigan Library has created a freely-available seven-week course entitled "Fake News, Lies, and Propaganda: The Class."

While this work often lies within the purview of libraries and librarians, some universities have refocused the challenge as a broader concern. At the University of Washington, for example, the strategic planning department has taken on the task of confronting fake news and misinformation and created a comprehensive toolkit for all faculty. Additionally, University of Washington professors Carl Bergstrom and Jevin West have made all the materials for their one-credit course "Calling Bullshit: Data Reasoning in a Digital World" freely available. News organizations, too, are taking up the task: KQED's *The Lowdown* has created a "Lesson Plan in Fighting Fake News" that can be incorporated into any syllabus.

I have seen some of the greatest light bulb moments happen when I'm talking individually with students in research consultations and can share my information literacy manifesto in a more personal way. Recentering their relationships to information around truth appeals to many students by engaging their interest in ethics and social justice, their growing awareness of their own social-emotional well-being, and their desire to make an impact as they gain a sense of their own agency in the world. The online survival skills I share with them in these moments include pieces of advice like these:

- Keep truth alive! Truth is a participatory process, like democracy.
- Always center your online dialogues around facts and evidence.
- Always cite your sources, even with friends and family, even on social media.
- If a questionable claim or an undocumented source serves your own political purposes or belief systems, stay curious: double down on investigating the idea and asking for proof.
- When a piece of information you encounter elicits strong feelings, remember to practice self-awareness around manipulation.
- If a heated online debate leaves you at a loss for words, you can always lean on trusted sources to locate talking points or cheat sheets, making sure those sources are reputable organizations citing evidence-based research.

Students want to understand their place in the information ecosystem, and as they grapple with that, they can benefit from the deep learning we can facilitate. When we collaborate across disciplines

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and domains and unite in our efforts to help students make sense of this moment when truth is in crisis, we can move the dial in the right direction, toward clarity and understanding, toward a true information literacy.

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Appendix: Additional Resources

Tool Kits and Lesson Plans

PBS Learning Media (a curated collection of standards-aligned media literacy learning objects and lesson plans from KQED and PBS): https://ca.pbslearningmedia.org/

Calling Bullshit: Data Reasoning in a Digital World (Carl Bergstrom and Jevin West): https://callingbullshit.org/about.html

Community of Online Research Assignments: https://www.projectcora.org/

Confronting Fake News and Misinformation (University of Washington Strategic Planning): http://www.washington.edu/strategicplanning/fake-news/

Designing Assignments for Critical Thinking (DePaul University): https://resources.depaul.edu/teaching-commons/teaching-guides/assignment-design/Pages/critical-thinking.aspx

Fake News, Lies, and Propaganda: The Class (University of Michigan Libraries): https://sites.google.com/umich.edu/library-fake-news/home

Four Moves and a Habit (Mike Caulfield): http://www.aascu.org/ADP/DigiPoInfographic.pdf

Fake News: Fight Back (ACRL Framework Sandbox): http://sandbox.acrl.org/library-collection/fake-news-fight-back

ACRL Framework for Information Literacy Toolkit (ACRL): http://acrl.libguides.com/framework/toolkit

How to Spot Fake News Infographic (International Federation of Library Associations [IFLA]): https://www.ifla.org/publications/node/11174

Lesson Plan: Filter Bubbles (Shaherzad Ahmadi): https://www.dwrl.utexas.edu/2018/01/02/lesson-plan-filter-bubbles/

Lesson Plan: Fighting Fake News (KQED Learning: The Lowdown):https://cdn.kqed.org/wp-content/uploads/sites/26/2016/12/Fake-news-lesson-plan.pdf

Mind Over Media: Analyzing Contemporary Propaganda Lesson Plans (Media Education Lab): https://mediaeducationlab.com/mind-over-media-analyzing-contemporary-propaganda-0

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Fake News Research Guide (KT Lowe, Indiana University East and Anne Agee, San Jose State University): https://libguides.sjsu.edu/fake-news

Fake News Research Guide (Shawn Heiser, San Francisco State University): http://libguides.sfsu.edu/fakenews

Web Literacy for Student Fact-Checkers (Mike Caulfield): https://webliteracy.pressbooks.com/

Wikipedia: How to Run an Edit-a-Thon:
https://en.wikipedia.org/wiki/Wikipedia:How_to_run_an_edit-a-thon

WikiProject Reliability: https://en.wikipedia.org/wiki/Wikipedia:WikiProject_Reliability

Fact-Checking Resources for Students

FactCheck.org: https://www.factcheck.org/

Hoax-Slayer: https://hoax-slayer.com/

PolitiFact: https://www.politifact.com/

Poynter Fact-Checking Research: https://www.poynter.org/tag/fact-checking-research/

Snopes: https://www.snopes.com/

Context on Misinformation for Students and Instructors

Beware Online "Filter Bubbles" (TED Talk, Eli Pariser):
https://www.ted.com/talks/eli_pariser_beware_online_filter_bubbles?language=en

Blue Feed, Red Feed (Wall Street Journal, no longer updated): http://graphics.wsj.com/blue-feed-red-feed/

Students' Civic Online Reasoning (Stanford History Education Group [SHEG]): https://sheg.stanford.edu/students-civic-online-reasoning

Fake News: It's Complicated (Claire Wardle): https://firstdraftnews.org/fake-news-complicated/

Hacking the Attention Economy (Danah Boyd): https://points.datasociety.net/hacking-the-attention-economy-9fa1daca7a37

Media Bias Chart (Vanessa Otero): https://www.adfontesmedia.com/the-chart-version-3-0-

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what-exactly-are-we-reading/

The 5 Principles of Ethical Journalism (Ethical Journalism Network): https://ethicaljournalismnetwork.org/who-we-are/5-principles-of-journalism

Critical Information Literacy

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