



Peer-Reviewed Article

Tools, tests, and checklists: The evolution and future of source evaluation frameworks

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ABSTRACT

In this article, we connect the scholarly conversations around established and emerging source evaluation frameworks such as the ABCs of website evaluation, CRAAP Test, DIG Method, RADAR approach, SIFT Method, the Proactive Evaluation approach proposed by the Project Information Literacy Team. We then explain each evaluation framework, delineating which framework is appropriate for a particular format, such as scholarly sources, online sources, image-based sources, and/or networked information sources. Lastly, we showcase the ways we have incorporated these source evaluation frameworks into our own classroom instruction and provide readers with ideas on how to do the same within their own institutional contexts.

KEYWORDS

information literacy instruction; CRAAP Test; DIG Method; RADAR approach; SIFT Method

SUGGESTED CITATION

Sye, D., & Thompson, D.S. (2023). Tools, tests, and checklists: The evolution and future of source evaluation frameworks. *Journal of New Librarianship*, 8(1), 76–100. <https://doi.org/10.33011/newlibs/13/9>

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Introduction

As research and instruction librarians working within an academic library setting, we focus on teaching students on how to find, evaluate, and cite information. Certainly, training students in source evaluation is one of the main responsibilities of our jobs. However, at the beginning of our careers, neither author felt as though our respective MLIS degree programs prepared us for this integral component of our work with students, nor did we feel as though we were familiar enough with the various source evaluation techniques librarians used in their instruction. Because of this, and for the benefit of people new to the field of librarianship, we seek to connect the scholarly conversations around established and emerging source evaluation frameworks. The frameworks we examine here include the ABCs of website evaluation, the CRAAP Test, the RADAR approach, the Digital Image Guide (DIG) Method, the SIFT Method, and the Proactive Evaluation approach.¹ We acknowledge an evaluation of every existing source evaluation framework is beyond the scope of this paper. We selected these frameworks because they, in our opinion, represent the most established and innovative source evaluation frameworks developed as teaching tools.

In this article, we explain each selected evaluation framework, delineating which framework is appropriate for a particular format, such as scholarly sources, online sources, image-based sources, and/or networked information sources. Lastly, we showcase the ways we have incorporated these source evaluation frameworks into our classroom instruction and provide readers with ideas on how to do the same within their own institutional contexts. Source evaluation techniques go by many names and are referred to interchangeably as "approaches," "guides," "methods," and "tests." For simplicity's sake, we will be referring to these techniques as *source evaluation frameworks*.

Literature Review

The Development of Critical Thinking in Modern Education

Evaluating information sources is a component of critical thinking; within the context of information literacy, this means thinking critically about a source and its content rather than accepting either as automatically credible. In America, John Dewey is often credited as the 'father' of the modern critical thinking tradition within the field of education (Streib, 1992; Fisher, 2001; Hitchcock, 2018). Dewey (1910) describes the process of "reflective thinking" as "active, persistent, and careful consideration," as opposed to jumping to a conclusion (p. 6) and writes, for this type of thinking, "the ground or basis for a belief is deliberately sought and its adequacy to support the belief examined" (p. 2). Edward Glaser, building off Dewey's ideas,

¹ Our aim is not to replicate the work done by the Container Conundrum Group at the University of New Mexico. Please see their article *Strategic Source Evaluation: Addressing the Container Conundrum* for their approach to source evaluation rooted in format and authority threshold concepts and an extensive cross reference of 25 source evaluation frameworks.

defined critical thinking as "1) an attitude of being disposed to consider in a thoughtful way the problems and subject that come within the range of one's experience," as well as "2) knowledge of the methods of logical inquiry and reasoning," and, "3) some skill in applying those methods" (Glaser, 1941, p. 5-6). Stephen P. Norris and Robert Ennis expand on this idea, emphasizing decision-making as a key aspect of critical thinking (1989).

Alec Fisher, formerly the Director of the Centre for Research in Critical Thinking at the University of East Anglia, England, outlines how his conception of critical thinking has evolved, making several important leaps toward our current understanding of critical thinking. He writes "critical thinking is skilled and active interpretation and evaluation of observations and communications, information and argumentation," and contends that critical thinking "is an academic competency akin to reading and writing," (Fisher and Scriven, 1997, p. 21 as cited in Fisher, 2001, p. 10) contextualizing the place of critical thinking within education. Indisputably, critical thinking is considered a fundamental goal of learning in higher education (Kuhn, 1999; Keeley & Shemberg, 1995). Fisher draws attention to the idea that one must think about their own thinking in order to improve and develop critical thinking ability (Paul, Fisher, and Nosich, 1993, p. 4 as cited in Fisher, 2001, p. 5); an idea we now identify as metacognition. He asserts that the idea of metacognition has been largely agreed upon by teachers (2001), as critical thinking is the foundation of important learning and developmental frameworks, such as Bloom's taxonomy.

Bloom's taxonomy, officially a "taxonomy of education objectives" was published in 1956 and has since been published in 22 languages. It is a classification system used to define and distinguish different levels of human cognition. According to Lai (2011), Bloom's taxonomy for information processing skills (1956) is "one of the most widely cited sources for educational practitioners when it comes to teaching and assessing higher-order thinking skills" (p. 8). It "remains, even after nearly fifty years, the de facto standard" (Forehand, 2010, p. 41) and has been "transformed into a basic reference for all educators worldwide" (Anderson & Sosniak, 1994, p. 1).

For those unfamiliar, there are six levels to Bloom's taxonomy: Knowledge, Comprehension, Application, Analysis, Synthesis, and Evaluation (Bloom, 1956). The first three levels are commonly and collectively referred to as the lower levels, or lower-level thinking, and the latter three levels are commonly and collectively referred to as the higher levels or higher-level thinking. The three highest levels – analysis, synthesis, and evaluation – are frequently said to represent critical thinking (Kennedy, Fisher, & Ennis 1991; Paul, 1985), and critical thinking abilities and skills show up in these three highest levels (Hitchcock, 2018) as illustrated in the following objectives outlined by Bloom (1956, p. 206-207):

- *analysis objectives*: ability to recognize unstated assumptions; skill in distinguishing facts from hypotheses; ability to check the consistency of hypotheses with given

information and assumptions; skill in comprehending the interrelationships among the ideas in a passage; ability to recognize the general techniques used in advertising, propaganda and other persuasive materials

- *synthesis objectives*: skill in writing, using an excellent organization of ideas and statements; ability to propose ways of testing a hypothesis; ability to formulate appropriate hypotheses... and to modify hypotheses in the light of new factors and considerations
- *evaluation objectives*: judging by internal standards, the ability to assess general probability of accuracy in reporting facts from the care given to exactness of statement, documentation, proof, etc.; ability to indicate logical fallacies in arguments, comparison of major theories, generalizations, and facts about particular cultures; judging by external standards, the ability to compare a work with the highest known standard in its field – especially in light of other works of recognized excellence.

Although Anderson and Krathwohl (2001) revised Bloom's taxonomy,² the connection between evaluation and critical thinking remains intact.

The Development of Source Evaluation Frameworks

As the world wide web, now commonly referred to as the internet,³ gained traction as a place to find information in the 1990s (Lee, 2015; Murphy, 2019), the process of finding sources for research changed dramatically. As early as 1995, Pask and Snow wrote "Undergraduates need to place the Internet [sic] in their mental model of information retrieval tools and develop proper strategies for fulfilling their information needs" (p. 311). They discussed library instruction methods in relation to using the internet and stipulated that it was very different from other electronic information systems students may have been familiar with at the time, since the internet is not a static resource and continues to change. As content found on the internet was not reviewed by a librarian like collected print materials, students who were unaware of such "invisible filters" of information may not have realized what was lacking when engaging with internet sources (p. 307). According to Kuhlthau, as information seekers moved through what she called the Information Search Process, they experienced a series of emotions from uncertainty to satisfaction (1991; Kuhlthau, et al. 2004). Further research suggests that the internet, specifically the ease of access to information, changed students' conception of the research process (Holliday & Li, 2004). Students expected to find information quickly and without effort; when students encountered problems and obstacles, they became confused and frustrated (Bilal, 2002; Branch, 2003, Holliday & Li, 2004, as cited in Kuhlthau, 2004).

² Anderson and Krathwohl's taxonomy is as follows: Remembering, Understanding, Applying, Analyzing, Evaluating, Creating.

³ Although many people now regard the web as synonymous with the internet, it is technically just one of many internet applications.

Throughout the years, many librarians have outlined different criteria for source evaluation. Much of the criteria included in early evaluation frameworks comes from criteria librarians used to assess conventional print publications (McMurdo, 1998; Metzger, 2007) or criteria used to select materials for a library collection (Caulfield, 2018).⁴ Attempting to define evaluation criteria for internet sources, Smith (1997) includes a variety of criteria, many with subfactors, such as scope (breadth, depth, time, format), content (accuracy, authority, currency, uniqueness, links made to other resources, quality of writing), graphic design, purpose (audience), reviews, workability, and cost (p. 9-14). Tate and Alexander (1996) agree that “given the extremely uneven quality of material on the Web [sic], it is critical that Web [sic] users learn how to evaluate the material they find” (p. 49). Their lesson plan includes a checklist of “five criteria traditionally used to evaluate print resources”: authority, objectivity, currency, and coverage of the information (Tate & Alexander, 1996, p. 50) and they go on to state that .edu and .gov domains are an indicator of factual information (p. 54). In 2000, the Association of College & Research Libraries (ACRL) released *Information Literacy Competency Standards for Higher Education*. Standard Three states that “the information literate student evaluates information and its sources critically and incorporates selected information into his or her knowledge base and value system” (ACRL, 2000, p. 11). One of the included outcomes describes that students evaluate the reliability, validity, accuracy, authority, timeliness, and bias of sources, in addition to prejudice, deception, or manipulation (ACRL, 2000, p. 11). According to Metzger, the literature consistently identified five criteria that users should use to evaluate online sources: accuracy, authority, objectivity, currency, and coverage or scope (2007, p. 2079). In an effort to make the process of evaluation easier to remember, source evaluation frameworks, like the CRAAP Test, a checklist-based approach, were developed (Blakeslee, 2004). Criticism about these types of approaches developed almost concurrently, claiming the model rests on faulty assumptions about the nature of information online (Meola, 2004).

Metzger et al. (2003) noted that since the internet and the world wide web connected users “in ways never before possible,” new attention was brought to the “issue of credibility across sources, messages, and media”:

These technologies have changed human association by making point-to-point communication increasingly feasible, resulting in greater availability of more diverse information sources and resources than at any time in the past. A consequence is that the filters and control mechanisms, which formerly served to validate and endorse a rather limited number of information outlets, may not be as effective in this new media environment. Absent such controls, information assessment and verification - core

⁴ See Mike Caulfield's blog post *A Short History of CRAAP* for an extensive investigation into the criteria for source evaluation: <https://happgood.us/2018/09/14/a-short-history-of-craap/>.

components of source, message, and medium credibility - now often become the responsibility of the media consumer. (p. 293-294)

The internet changed the historic role of many librarians - that of gatekeeper or curator of verified information sources - to instructor of source evaluation as students increasingly encountered information for themselves on the "wild wild web." Instead of serving as a control mechanism, librarians needed to teach students how to evaluate sources beyond traditional scholarly sources historically found in physical print journals and books found within the walls of the academic library. Metzger (2007) summarized and examined studies about the skills that internet users need to assess the credibility of online information, concluding that "motivation is a key ingredient in users' willingness to undertake extensive effort to verify the credibility of information they find online" (p. 2089).

Flanagin and Metzger (2008) examined source credibility in the context of the "digital native" narrative purported by Prensky (2001), which has been since been debunked (Bennett & Maton, 2010; Facer & Furlong, 2011; Valentine, Holloway, & Bingham, 2022, Helsper & Enyon, 2010; Kirschner & De Bruyckere, 2017) and within the context of the emerging fields of digital literacy and media literacy. They contended that younger users, who have a relative lack of life experience, were at "greater risk for falsely accepting a source's self-asserted credibility" and may not have had the same level of skepticism toward online sources as adults. They suggested that educators needed to "find ways to support what kids are naturally doing with digital media and to leverage that into opportunities to teach critical thinking (2008, p. 18). As Asher and Duke (2012) surmised, "the ability to conduct a successful and efficient search for high-quality information is a critical thinking skill that is central to life in contemporary information and knowledge-driven environments" (p. 71).

These skills became even more important in the context of "fake news" and the burgeoning amount of misinformation related to the 2016 American Presidential Election. Within the online realm of "post-truth," "truthiness," and "alternative facts," students need critical evaluation skills to combat the effects of fake news and hone their information consumption habits (Cooke, 2017, p. 211). As Elmborg (2006) noted, information literacy skills provide a necessary foundation for civic engagement (as cited in McGeough and Rudick, 2018, p. 166). The source evaluation frameworks discussed here all stem from a perceived need to better assist students in the development of their information literacy skills, and, most importantly for this discussion, their ability to evaluate the sources they encounter by thinking critically.

Source Evaluation Frameworks

The idea of evaluating sources has always been important, but the task mainly resided with librarians performing collection development as they carefully selected materials for the library collection or assessed conventional print publications. This changed with the internet, as

accessing material via the web skips over the middle (wo)man who would normally curate and evaluate information sources. Many evaluation criteria exist, but in the early 2000s, librarians sought to come up with catchy acronyms in order to remember key questions using a checklist approach (Blakeslee, 2004). Librarians have since developed reflective, investigative, and proactive evaluation frameworks in response to technological developments such as social media, algorithms, and networked information as well as mis- and dis-information.

The ABCs of Web Evaluation

The first evaluation framework we examine is not necessarily a single checklist used repetitively, but rather an acronym applied in similar ways by various librarians and information literacy professionals. The first published use of applying “ABC” as criteria for online source evaluation came from Schrock (1998), where she introduced the “ABCs of Web Site Evaluation” (p. 4). Here 'A' stood for authority, 'B' for bias, and 'C' for citations. Authority and bias were accompanied by checklist questions. The list also goes further, listing a term and description for each letter, all the way through Z. Though no other term is listed with checklist questions, and due to trying to find a term for every letter, not every term is equally useful in terms of teaching about web evaluation. Nevertheless, this was the first published use of an acronym for source evaluation.

Browsing through various LibGuides from university libraries, it appears the ABCs of evaluation typically refer to authority, bias, and then some variation when it comes to C: content, currency, consistency, or a combination of these terms. The earliest documentation of this framework comes from *School Libraries Canada* (2001), where the criteria for evaluating internet resources include Authority, Accuracy, Bias, Currency, and Coverage (p. 32). Questions include:

- Authority
 - Is it clear who is responsible for the contents of the page? (organization’s name)
 - Is there a way of verifying the legitimacy of the page’s sponsor? (phone number, address, something other than e-mail address?)
 - Is it clear who wrote the material and are the author’s qualifications clearly stated?
 - Is the material protected by copyright and is the copyright holder named?
- Accuracy
 - Are the sources for any factual information clearly listed so they can be verified?
 - Is the material free of grammatical, spelling, and typographical errors?
 - Is it clear who has the responsibility for the accuracy of the content of the material?
 - If charts or graphs are included, are they clearly labeled and easy to read?

- Is the information valuable and/or appropriate to your task?
- Objectivity or Bias
 - Does the site rely on loaded language or broad, unsubstantiated statements?
 - Is emotion used as a means of persuasion?
 - Does the site offer more than one viewpoint?
 - Are there links to other or alternative viewpoints?
- Currency
 - Are there dates on the page to indicate:
 - When the page was written?
 - When the page was first placed on the Web?
 - When the page was last revised?
 - Are there any other indications that the material is kept current?
 - If graphs or charts are included, is it clearly stated when the data were gathered?
- Coverage
 - Does the information presented seem to be complete?
 - Is the information consistent with what you already know or have found in other sources?
 - Does the site include a paragraph that explains what its purpose is? (to entertain, explain, advertise, persuade, or inform)
 - Are there links to other sites to support or enhance the information presented?
(Internet Resource Evaluation Criteria, 2001, pg. 32)

Overall, the source evaluation framework provides yes/no and closed-ended questions and is specific to web searching and websites. This framework was mainly promoted as an evaluation strategy in elementary and secondary environments, and, in fact, was originally included as part of a lesson plan for grades 6-9 (Resource Evaluation Lesson Plan, 2001, p. 28-29).

Eventually, the ABC-style checklist entered the university realm. While there is some variation between specific questions, the criteria listed across various university LibGuides generally follow the pattern of closed-ended questions. Due to its widespread inclusion on LibGuides, it is difficult to pinpoint when and how this was adopted by university librarians. The earliest published use by a postsecondary institution we found is from a document created by Val Ontell at San Diego Mesa College in 2009. Ontell's criteria include authority, bias, currency, and content (2009). Whether or not this prompted universities to start including ABC-style

evaluation frameworks in information literacy instruction is unclear. Although this approach is widely used, we could not identify a version that was consistently applied verbatim. The use of “ABCs” to provide an introduction to a topic is fairly common, and criteria such as authority, bias, and currency exist in some form in several other evaluation frameworks.

The CRAAP Test

The CRAAP Test was developed in 2004 by Sarah Blakeslee, a librarian at California State University, Chico. Her goal was to find a way to help students remember evaluation criteria using a unique and memorable acronym. CRAAP stands for currency, relevance, authority, accuracy, and purpose. Each of these criteria is accompanied by several closed-ended questions to be applied when encountering a new piece of information (Blakeslee, 2004, p. 6). Below are descriptions of the evaluation criteria:

- **Currency:** The timeliness of the information
 - When was the information published or posted?
 - Has the information been revised or updated?
 - Does your topic require current information, or will older sources work as well?
 - Are the links functional?*
- **Relevance:** The importance of the information for your needs
 - Does the information relate to your topic or answer your question?
 - Who is the intended audience?
 - Is the information at an appropriate level (i.e., not too elementary or advanced for your needs)?
 - Have you looked at a variety of sources before determining this is one you will use?
 - Would you be comfortable citing this source in your research paper?
- **Authority:** The source of the information
 - Who is the author/publisher/source/sponsor?
 - What are the author's credentials or organizational affiliations?
 - Is the author qualified to write on the topic?
 - Is there contact information, such as a publisher or email address?
 - Does the IRL reveal anything about the author or source? Examples: .com, .edu, .gov, .org, .net*
- **Accuracy:** The reliability, truthfulness, and correctness of the content

- Where does the information come from?
- Is the information supported by evidence?
- Has the information been reviewed or refereed?
- Can you verify any of the information in another source or from personal knowledge?
- Does the language or tone seem unbiased and free of emotion?
- Are there spelling, grammar, or typographical errors?
- Purpose: The reason the information exists
 - What is the purpose of the information? Is it to inform, teach, sell, entertain, or persuade?
 - Do the authors/sponsors make their intentions or purpose clear?
 - Is the information fact, opinion, or propaganda?
 - Does the point of view appear objective and impartial?
 - Are there political, ideological, cultural, religious, institutional, or personal biases?

There are specific criteria indicated for web sources, marked with an asterisk, showing that the test is designed to be applied to information found online as well as scholarly sources (Blakeslee, 2010, p.1).

CRAAP is not without its critics, however, and there are several pieces of literature assessing the usefulness of the framework (Meola, 2004; Ostenson, 2014; Breakstone, et al., 2018; Fielding, 2019; Blizzard, 2021; Faix, 2021; Liu, 2021; Lowe et. al, 2021). Caulfield (2018) provides a history of the CRAAP test and attempts to apply the checklist on an interactive fact-check site assessing the claim that Russian reporters were fired after criticizing the Russian government. Based on answers to the various questions on the checklist, the source passes the test. He asserts that the CRAAP Test sidesteps the real issue: that the site is part of a media group widely regarded to be Russian state-sponsored propaganda. Similarly, certain recommendations and previous guidelines are now outdated. For example, following CRAAP, students may look at a URL and determine “.com” automatically means for-profit and “.org” means non-profit, and that information from non-profits is automatically more reputable. As many examples of misinformation show, it is incredibly easy for bad actors to create a professional-looking site and register under a “.org” domain.

The RADAR approach

The RADAR approach was developed by Jane Mandalios in 2013 in response to the “challenge posted by the huge extent and free availability of the information” available online (p. 471). RADAR combines elements of the checklist approach as well as a contextual approach,

such as that proposed by Meola (2004), which requires users to make use of information external to the source in order to evaluate it. RADAR is both a metaphor and an acronym. Mandalios (2013) compares using the web to navigating the ocean, where ships utilize radar for successful navigation (p. 472-473). RADAR stands for relevance, authority, date, appearance, and reason for writing, with each criterion accompanied by a mix of closed and open-ended questions. Questions are as follows:

- Relevance: **How** is the information that you have found relevant to your assignment?
- Authority: **Who** is the author?
- Date: **When** was the information published?
- Appearance: **What clues** can you get from the **appearance** of the source?
- Reason for writing: **Why** did the writer publish this? (Mandalios, 2013, p. 474).

As opposed to a mechanical “checking-boxes” technique, RADAR is designed to be, “an understanding on the part of the information-searcher of the need for a heightened awareness of what is ‘out there’” (Mandalios, 2013, p. 477). RADAR is mainly a tool to evaluate sources found online. When Mandalios tested this out in a case study with twenty students, they had an interactive session assessing live internet sites (Mandalios, 2013), unlike previous studies which were based on mock-ups of sites. It is important for students to practice with real information they may encounter and Mandalios' study showed the effectiveness of the source evaluation framework in a real-world setting. In addition to academic settings, the RADAR approach has also been taught to patrons in public libraries as a strategy to combat misinformation (Ireland et al., 2017).

The DIG Method

The Digital Image Guide (DIG) Method was developed in 2018 by author Dana Statton Thompson. It was codified when published as a Teaching Idea in a special issue of the *Journal of Visual Literacy* in 2019 (Thompson, 2019). Thompson created the method because there did not appear to be any established criteria for evaluating digital images as information, unlike the CRAAP Test and others that existed for textual information, be it online or in print. Since misinformation is increasingly spread through the use of images, such as pictures taken out of context, photoshopped images, and memes (Garimella and Eckles, 2020; Brennen et al., 2021), it is imperative to have a way to evaluate images. The DIG Method provides a framework, in the form of a series of questions, for students to use to critically evaluate digital images. The DIG Method is specifically meant for 'deep images' which are images that "are created and posted online to perform different roles and fulfill different intentions: to inform, to mislead, to persuade, and or to sell" (Thompson, 2019, p. 3) and includes news and advertising photographs and may include other types of visuals such as memes.

Thompson developed the DIG Method by adapting questions found in an online LibGuide about evaluating images (University of California–Irvine Libraries, n.d.) as well as those found in ‘The Visual Literacy White Paper’ (Bamford, 2003, p. 6-7) and in the book *Visual Literacy for Libraries: A Practical, Standards-Based Guide* by Brown et al. (2016, p. 20). [They] then categorized the questions using Manarin et. al's (2015) steps of critical reading which include analyzing, interpreting, evaluating, and comprehending (p. 4-6).⁵ The questions in the DIG Method include:

Analyzing:

1. Review and describe the image.

Who, what, when, and where do you see represented in the image?

2. Review the text.

What textual information is provided (caption, date, and/or headline)?

3. React to the image.

How does the image make you feel?

Interpreting:

1. Determine the source (creator, publisher and/or website) of the image.

Who created the image? Who owns and/or published the image?

2. Determine the message of the image.

What is the message? Who is the intended audience?

3. Search for other online sources that further contextualize the image.

How does context (social, cultural, historical, and/or political) inform the image?

Evaluating:

1. Think back to your first reaction to the image.

How might your reaction impact how you view the image?

2. Refer back to the other websites that have published the image.

Has the image been misrepresented or manipulated?

3. Assess the reliability and accuracy of the image.

Is the image reliable and accurate? Why or why not?

⁵ For more information on The Dig Method and critical reading, see Beene and Thompson article *Focusing on Slow Looking: An Exploration of Techniques to Develop Critical Observation Habits* <https://www.journals.uchicago.edu/doi/abs/10.1086/719405>

Comprehending:

1. What judgments can you make about the image based on your evaluations above and the available information?
2. Do any of your biases or point of views impact how you view the image? If so, how?
3. What is the purpose of this image (to inform, to instruct, to sell, to entertain, to enjoy, and/or to persuade)? Why do you think so?

The questions vary from open- and closed-ended questions to reflective and probing questions. They are meant to aid students' evaluation process when they search the web to find visual information or encounter visual images on social media. Although Thompson created the DIG Method for use in a higher education setting, the questions could be easily adapted for primary and secondary school students as well.

The DIG Method has also been investigated independently using a quasi-experimental research method to determine the effect of the DIG Method on students' visual literacy skills (F. Rahimi, S. Rahimi, & Nushi, 2021). They found that the DIG Method "had a positive and significant effect on students' visual literacy" (p. 617). These same researchers also used the DIG Method to determine what effect, if any, the Method had on Iranian EFL (English as a foreign language) learners' intercultural communicative competence, which is the ability to communicate effectively and appropriately in various cultural contexts (S. Rahimi, M. Nushi, & F. Rahimi, 2021). After receiving the same nine 30-minute training sessions as the group in the first research study, the researchers determined that "using the digital image guide [sic] helped improve the learners' intercultural communicative competence and its components" (p. 294). Other librarians are beginning to include the DIG Method as a method for evaluating images on their LibGuides,⁶ so the findings of these independent investigations are promising for visual literacy efforts in libraries.

The SIFT Method

Mike Caulfield, a digital information literacy expert working at Washington State University, Vancouver, first developed the source evaluation framework we now know as SIFT in 2017 in his book *Web Literacy for Student Fact-Checkers* as the "Four Moves." The original four moves were to:

- Check for previous work: Look around to see if someone else has already fact-checked the claim or provided a synthesis of the research.

⁶ See https://libguides.cmich.edu/web_research/craap, <https://libguides.bham.ac.uk/asc/visualliteracy>, https://guides.libraries.indiana.edu/Visual_Literacy/Interpreting_and_Analyzing, and <https://library.ucf.edu/about/departments/student-learning-engagement/instruction-options-by-topic/>

- Go upstream to the source: Go "upstream" to the source of the claim. Most web content is not original. Get to the original source to understand the trustworthiness of the information.
- Read laterally: Once you get to the source of the claim, read what other people say about the source (publication, author, etc.) The truth is in the network.
- Circle back: If you get lost, hit dead ends, or find yourself going down an increasingly confusing rabbit hold, back up and start over knowing what you know now. You're likely to take a more informed path with different search terms and better decisions. (Caulfield, 2017, para. 4).

The method was codified as "SIFT" in 2019. SIFT includes a series of actions, rather than a series of questions, meant to contextualize the found information. The method is meant to be used for evaluating information found on social media and the internet, especially news articles in the context of misinformation. The SIFT acronym stands for:

- Stop
- Investigate the source
- Find better coverage, and
- Trace the original context (Caulfield, 2019, para. 4).

Caulfield has since created a three-hour online minicourse based on the SIFT Method⁷ which includes five lessons, with each lesson taking approximately 30 minutes to complete. The course "is suitable homework for the first week of a college-level module on disinformation or online information literacy, or the first few weeks of a course if assigned with other discipline-focused homework" (Caulfield, n.d., para. 1). Most recently, Caulfield has created an "information literacy hub" about the coronavirus pandemic called *Sifting Through the Pandemic: Information hygiene for the Covid-19 infodemic* (Caulfield, 2022).

The SIFT Method has been embraced by librarians and has been widely incorporated into LibGuides on academic libraries websites in the United States. In fact, as of this writing, the five pages of a Google search return are almost exclusively LibGuides. Recent criticism of the SIFT Method contends that "while it is much better suited to today's context, where misinformation and algorithms proliferate, SIFT is still based on students encountering individual information objects, without necessarily understanding them as part of a system" (Bull et. al, 2021, para. 11). Indeed, the SIFT Method does not take into consideration how a user arrived at the initial source to begin with. In practice, this should not be too concerning because a lateral search should address any dubious elements of the source. From an instructional

⁷ See <https://www.notion.so/checkpleasecc/Check-Please-Starter-Course-ae34d043575e42828dc2964437ea4eed> for the Check, Please! Starter Course.

perspective, however, we need to understand that students often make a rapid assessment of a source's usefulness, based on a quick scan of a title or abstract (Asher and Duke, 2012, p. 80). Whereas SIFT focuses on strategies to assess claims made in a source, students may decide to include a source before they even get to that point. According to Bull et. al:

That is why it is time to consider a new approach to the teaching of source evaluation in order to keep up with the volatile information ecosystem. Allowing for information to have agency, i.e., acknowledging information as active, targeted, and capable of influencing action, fundamentally alters the position of the student in the act of evaluation and demands a different approach from instruction librarians. (2021, para. 17)

This new approach is called the "Proactive Evaluation" approach.

The Proactive Evaluation approach

Informed by Project Information Literacy's algorithm study published in 2020, and written by Alaina C. Bull, Margy MacMillan, and Alison J. Head, the Proactive Evaluation approach stipulates that there has been a "dramatic shift" on the internet from "*when you found information [sic]*" to "*information finding you [sic]*" (Bull et. al, 2021, para. 7). They outline how tracking software, used by behemoths such as Google, Facebook, Amazon, and others, now allows information to find you, the user, rather than previous iterations of the internet where the user found information and then evaluated the information they found (Bull et. al, 2021, para. 7). This type of software targets the user to determine what information they *should* receive based on specific markers and turns our understanding of how finding information online works upside down. They explain:

Our proposed next step, what we call *proactive evaluation*, would allow them not only to evaluate what they're seeing but consider why they're seeing what they do and what might be missing. SIFT, like CRAAP, is based on a reactive approach: the individual is an *agent*, acting upon information objects they find. In today's information landscape, we think it is more useful to invert this relationship and consider the information object as *the agent that is acting on the individual it finds*. (Bull et. al, 2021, para. 12)

More traditional source evaluation frameworks assume that users find information. However, consider how you actually encounter information in your daily life. Whether you are expecting it or not, information now targets you through social media and websites with ads and sponsored content. This shift in perspective is a core argument to the Proactive Evaluation approach.

The authors also assert that we should shift from asking closed-ended questions, (e.g., 'Is it written by an expert?' or "Is it current?") to engage in an open-ended inquiry process with students by asking questions such as "If this information showed up in your news stream, what tactics would you use to decide if you wanted to pass it along?" and "What do you look for to

know if this is valid or useful information?" (2021, para. 23). They write "We have alluded to open-ended questions as part of the proactive approach, but this is more accurately described as an open dialogue" (2021, para. 31). Although not prescriptive, they provide questions an instruction librarian could incorporate into the discussion about whether or not to reshare a news story such as:

- What do you already know about the news source?
- What do you know about the person or account that initially shared it?
- How might you go about reading the source laterally?
- What do your instincts say?
- How does (or does not) this fit with your prior knowledge of the subject?
- Do you have any related reactions? (para. 32)

These questions are open-ended and networked. Similarly, and perhaps most importantly to this approach, is the understanding that information is also contextual and networked. Specifically, online sources are not found in a vacuum or a void, and instead rely on other points of information to inform our understanding of it.

Discussion

Our article thus far would indicate an evolutionary approach of source evaluation frameworks that has come to an apex with the Proactive Evaluation approach. However, we contend that due to the nuances of user habits, such as the fact that many students do not apply evaluation strategies 'correctly' or as they are taught, each of these various source evaluation frameworks have their place within the instructional repertoire we possess as teaching librarians. Contextual and proactive evaluation approaches are a logical end goal for teaching information literacy; however, it is important to recognize that like with any subject matter, there are necessary building blocks to get to that point. Similar to how algebra is the basis for most chemistry and physics calculations, learning different criteria from various source evaluation frameworks allows students to better understand how to examine the context of a source and conduct lateral reading. Here, we place them within context with one another and examine how to make the most use out of them while simultaneously preparing our students to be informed citizens.

We know that Mandalios' RADAR approach (2013) and Caulfield's SIFT Method (2018) were developed to address the drawbacks and disadvantages of using checklist-based approaches such as ABCs of source evaluation and CRAAP Test. While the RADAR approach and SIFT Method improve upon previous information literacy strategies, from an instructional perspective they should not completely replace their predecessors as each source evaluation framework has its own strengths and weaknesses. For example, the SIFT Method is great for

evaluating news sources and potential misinformation on the internet. The benefits of using strategies such as SIFT, however, derive from the assumption that students are not only motivated to fully evaluate a source, but also know how to use various tools to conduct a lateral read. Asher and Duke (2012) found that a majority of students struggled with finding and evaluating information for research projects, with difficulties ranging across every aspect of the search process (p. 73). Likewise, Wineburg and McGrew (2017) found that when compared to professional fact-checkers, undergraduate students did not try to pull up alternate coverage to evaluate a claim (p. 38; Wineburg et al., 2020). Whereas SIFT focuses on strategies to assess claims made in a source, students may decide to include a source before they even get to that point, making a debate between checklist approaches and contextual approaches moot.

The RADAR approach does not involve lateral reading as a main component. Instead, the strength in the approach lies in its mnemonic device which is intrinsically meaningful and related to its purpose, providing a “radar” to detect the quality of a source. This is in stark contrast to the CRAAP Test which can confuse students who are asked if their sources or research are “crap” as if that is a good thing, rather than an evaluation with particularly unsavory undertones. RADAR improves upon this drawback by directing students to “concrete tools as well as conceptual framings, short questions, and explanations (Russo et al., 2019, p. 299).

Despite its drawbacks when encountering misinformation or serving as a meaningful mnemonic device, teaching elements of the CRAAP Test can still be helpful for students learning how to evaluate peer-reviewed academic journal articles and other print sources for their research needs. Students adopt a variety of behaviors and habits to navigate information problems in the digital age, with many students entering higher education with insufficient information literacy skills (McGeough and Rudick, 2018, p. 167-168). Teaching the CRAAP Test helps these students because it teaches them key aspects of information they need to consider when choosing sources for assignments. The CRAAP Test can provide students with the appropriate criteria to evaluate scholarly sources based on their currency, relevancy, accuracy, authority, and purpose. The criteria, although lengthy with its accompanying series of questions, is extremely thorough and is appropriate for students who are starting their college career and may not be aware of the importance of each criterion.

We also acknowledge the problems inherent in the checklist approach. As Russo et. al write, “Checklists are often structured into mnemonic acronyms that are easily memorized..., but an unfortunate consequence is that students are left without a sense of what is hardest, easiest or most important to evaluate” (2019, p. 296). Both the DIG Method and the ABC Method attempt to remedy this. By structuring questions around the four steps of critical reading, students are more likely to understand the importance of each component included in the DIG Method, as well as benefit from the scaffolded approach inherent to the series of questions. The ABCs of source evaluation also serves as an easy, memorable acronym that can

be used in a quick one-shot instruction session to stress the importance of concepts such as Authority, Bias, Currency, and Coverage, pinpointing for students what to focus on in their evaluation. Finally, the Proactive Approach provides a great tool to use for when you have more time with students to discuss nuances about how we both find information and how information now finds and targets us. This approach can lead students to understand the hardest parts of evaluating online sources.

Using Source Evaluation Frameworks in Instruction

Equipped with a better understanding of these various strategies and frameworks, what does this all look like in practice? There are many ways to teach using these strategies, and other librarians will certainly design innovative instructional activities. Rather than offer a one-size-fits all activity, here we want to provide an example of an assignment that incorporates two source evaluation frameworks, CRAAP and SIFT. At Murray State Libraries, librarians have the unique opportunity to teach a semester-long course, *Research in the Information Age*, which allows us to try various instructional methods regarding source evaluation. One idea was to give an assignment where students would select and evaluate sources in a fairly low-stakes, curated environment. David Sye gave this assignment during the Fall 2021 semester and Dana Statton Thompson in the Spring 2022 semester. Using Gale's *Opposing Viewpoints* database, students selected an available topic from the database, and after reading through the viewpoint essays, chose two viewpoints on the select issue. In addition to the viewpoint essays, they were to find one scholarly article and one news article that support or align with the respective viewpoint. In total, they had six sources they would then evaluate and write about. For the viewpoint essays and scholarly articles, students answered questions based on the CRAAP Test. For the news articles, however, they answered questions created by David Sye, which align with the SIFT Method:

- Stop
 - Have you read articles from this media source and/or author before?
- Investigate the source
 - In 1-2 sentences, describe the information this source typically publishes
 - What are the author's credentials?
- Find better coverage
 - Find at least four other outlets that have reported on/discussed this issue.
 - Does the main claim represent a consensus viewpoint, or is it the subject of much disagreement? Explain in 2-3 sentences.
- Trace claims, quotes, and media to the original context

- What is the main claim being made in the article (describe in 1-2 sentences)?
- What context is the article missing? Explain in 1-2 sentences. Trace claims, quotes, and media to the original context

In addition to completing the CRAAP and SIFT questions, students had to then use the sources to write a short reflective essay in which they described the selected issue, described the two selected viewpoints, and discussed the evidence presented in the selected sources that support their respective viewpoint.

As mentioned before, Asher and Duke (2012) found that students struggled with the search process in general, as well as displaying a “willingness to settle for ‘good enough,’” often fitting papers and projects to what they were able to find (p. 72-73). When giving this type of assignment previously, some students missed that the goal was to develop evaluation skills, and spent a disproportionate amount of time finding articles only to ineffectively evaluate them. A benefit of directing students to a curated topic page on *Opposing Viewpoints* is that it forces them to focus on evaluating sources, which makes areas for improvement clearer to the instructor.

Through this assignment, we found students that struggle with choosing sources that were actually relevant or current to their selected viewpoints. We also wondered whether students actually understood how to evaluate sources or if they were just putting in filler answers to get credit. It may be that checklist questions, like those included in the CRAAP Test, are not conducive to a practical activity assigned to students. Therefore, questions incorporating aspects of various frameworks could be used as an introductory-level source evaluation exercise. Below is what we have started to implement in instruction this year (text in parenthesis indicate what frameworks these questions draw from):

- What new information, developments, or changes relating to this topic have come to light since the publication of this source? (CRAAP, currency; RADAR, date; DIG, analyzing; Proactive Evaluation)
- What are the specific claims, data, or descriptions in the source that help answer your question? (CRAAP, relevance; RADAR, relevance; SIFT, trace claims)
- Where does the author receive their information and data from? How is the cited information represented accurately or taken out of context? (CRAAP, Accuracy; SIFT, trace claims; RADAR, appearance; DIG, interpreting;)
- Does this information answer your question in full or just aspects of it? (CRAAP, relevance; RADAR, relevance; DIG, comprehension)

In sum, we believe source evaluation does not have to be an either/or but rather can be a both/and. By incorporating questions from multiple existing source evaluation frameworks, it is

possible for instruction librarians to create a source evaluation framework, as in the example above, that works from them and their students within their own institutional contexts. As opposed to using a static template, combining aspects of various strategies to cater instruction to students helps librarians and other instructors respond to an evolving information landscape. We look forward to other combinations and strategies our professional community develops.

Conclusion

There are a plethora of source evaluation strategies, tests, and frameworks that have been developed both to help students select sources for research and to combat misinformation, including many we did not discuss here. While there is no shortage of ideas, it is important to effectively embed these strategies into instruction and encourage our students to employ these skills as second nature. Bull et al. (2021) describe being proactive and looking at teaching source evaluation as an open dialogue. Due to the constantly changing information landscape, we as educators must accept that we will constantly have to modify how we teach source evaluation and thus how to speak to students about source evaluation. As previously mentioned, teaching the CRAAP Test near-exclusively for over fifteen years has not prepared students to effectively evaluate misinformation. However, instead of dismissing the CRAAP Test outright, we should instead teach students that certain strategies are less effective in certain situations compared to others. For students working on academic work, the CRAAP Test and RADAR approach feature elements effective for selecting sources for projects. The SIFT and DIG Methods, which employ lateral reading and examining additional sources, are useful tools when encountering information for personal use, whether it be news, social media, or other non-academic purposes. Finally, the proactive approach not only stands alone as an effective strategy but supplements other evaluation tools used as it is about understanding that online information is contextual and networked. By better understanding the uses of these evaluation strategies, instructors can more effectively prepare students for encountering information in this rapidly-changing information environment – in whatever form it takes.

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