

# Preparing College Students for a Digital Age: A Survey of Instructional Approaches to Spotting Misinformation

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Misinformation has become a regular feature of the Internet. Research suggests that everyone, including young people who have grown up with digital devices, struggles to differentiate fact from fiction online because they read closely rather than turning to external sources. We analyzed the resources students find when they seek advice offered by college or university websites on evaluating the credibility of online information. A random sample of 50 universities indicated that, for nearly all institutions, students are advised to engage in close reading to determine credibility. We conclude by recommending that institutions overhaul how they teach students to evaluate online sources.

## Introduction

Today's college students are often referred to as digital natives: their fluency in operating devices is also assumed to imply fluency in sorting through the information these devices provide.<sup>1</sup> The truth is more complicated.<sup>2</sup> Studies have shown that college students struggle to search for and evaluate the credibility of online information. In a study of 1,060 first-year college students, Hargittai demonstrated that digitally wired students are less than digitally savvy.<sup>3</sup> They use the order of search results to determine trustworthiness, unaware that Google's algorithm does not always elevate credible sources to the top of the Search Engine Results Page (SERP).<sup>4</sup>

After selecting a website, college students are often unable to effectively evaluate it. When assessing credibility, they rarely consider the source of the website or scrutinize the author's credentials.<sup>5</sup> Students typically rely on heuristics such as site design and relevance to search needs to decide whether to trust a website.<sup>6</sup> A study of 7,804 middle school, high school, and college students showed that they evaluate websites using superficial features such as site design, logos, a dot-org top-level domain, and whether a website has references—even if those references are to sources that do not support the claims being made.<sup>7</sup>

Colleges and universities are designed, in part, to help students meet the challenges they will encounter beyond graduation. The internet's centrality in modern life has added a new role for colleges and universities: how to provide students with the tools needed to safely navigate the web and reach sound decisions. With this in mind, we set out to examine the instructional

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resources students find when seeking guidance from their college and university websites on how to evaluate online information.

### **Conceptual Background**

Most web users, including college students, employ heuristics to assess a website's credibility.<sup>8</sup> Two early theories suggested that the prominence of information on a website is the primary factor in a user's evaluation. Information-foraging theory argued that internet users choose information based on what they notice and its relevance to their search.<sup>9</sup> B.J. Fogg's prominence-interpretation theory further posited that prominence, defined as the likelihood that information on a website will be observed by users, directly affected how people judged that information.<sup>10</sup>

People mainly employ surface features such as length, references, and writing style to quickly evaluate whether a website is professional.<sup>11</sup> In typical web evaluations, users remain on the website they are investigating to determine credibility and often rely on their background knowledge to assess whether a website should be trusted.<sup>12</sup> In sum, people often trust their ability to spot misleading information through a website's surface-level features and their preexisting knowledge. They also evaluate credibility based on the relevance of a given site to their search needs.

Popular news and media literacy approaches designed to support students in becoming better fact-checkers are consistent with the strategies that college students use. One such digital literacy approach roots itself in propaganda inoculation developed in response to print texts. It asks readers to analyze a page's content to determine the author's purpose and biases.<sup>13</sup> This kind of close reading carries over to how people currently approach web evaluation.<sup>14</sup>

### ***The Checklist Approach***

College librarians have employed numerous checklists designed to help students evaluate content on the internet. These resources often incorporate advice originally conceived for print sources. The CRAAP test, an acronym that stands for Currency, Relevance, Authority, Accuracy, and Purpose, was developed at California State University, Chico and has been adopted by librarians across the country.<sup>15</sup> Mike Caulfield, a research scientist at the University of Washington, traces the ubiquitous CRAAP checklist to 1978, where it was initially developed as a tool to select library materials.<sup>16</sup>

Checklists largely focus on a website's internal features. These include the presence or absence of a contact person, whether a website has references with working links, and the grammatical correctness of a website, among other criteria. The underlying assumption checklists share is that students can judge credibility by carefully inspecting the target site they are investigating.<sup>17</sup> Checklist approaches ask students to determine whether a website is trustworthy after they have spent considerable time on it.

Signaling theory describes how signals mediate a relationship between signaler and receiver: "Signals are any observable features of an agent which are intentionally displayed for the purpose of raising the probability the receiver assigns to a certain state of affairs."<sup>18</sup> In other words, a signaler intentionally presents a signal to increase the likelihood that the receiver of that signal will act in a certain way. On the internet, the signaler is the website creator and the receiver is the user. The internet user benefits if and only if they find credible information. The website creator benefits by gaining support, votes, adherence, or (in the case

of Russian disinformation) confusion. Thus, website creators have an incentive to signal to users that their website is credible, whether or not this is the case.

In the early days of the internet, signals such as banner ads, misspellings, and amateurish graphics indicated unprofessionalism and cast doubt on a website's reliability. Lower barriers to the production of information have democratized the internet and empowered marginalized voices. But they have also made it easier to spread misleading information. With little effort, website creators can intentionally infuse weak signals of credibility to increase the likelihood that a user will spend more time on their website and trust it.<sup>19</sup>

The website of the Employment Policies Institute, or EPI ([epionline.org](http://epionline.org)), illustrates the ease with which signalers can manipulate weak signals to deceive users. The website is designed to seem professional and unbiased: it has a dot-org domain, a heading that supposedly answers research questions with evidence, and an About page that describes the organization's managing director as an esteemed researcher who worked for the Bureau of Labor Statistics and has been published by *Forbes* and *The Washington Post*. In reality, EPI is funded by the restaurant industry. It offers misleading information about the risks of raising the minimum wage. But in one study, 90 percent of students were unable to identify EPI's source of funding and why it might be problematic, even though such information could be found with a quick Google search.<sup>20</sup> The students who struggled were the ones who stayed on the webpage and evaluated its internal signals carefully. Meola argues that this kind of approach, which he identifies as common to checklists, "rests on faulty assumptions about the nature of information available through the Web."<sup>21</sup>

### *The Networked Approach*

The networked approach to determining a website's credibility begins with different assumptions from the checklist approach. The checklist approach is in many ways a carryover from traditional analog-based vetting of texts, designed when sources were scarce, and therefore each had to be carefully mined and checked.<sup>22</sup> In contrast, the networked approach was designed in our current age of the internet: Sources today are abundant and, in many cases, overabundant. Each source is part of a network of information. To understand a single node in the network, one must place it in the context of other networked sources. On the internet, an individual website—a node—is best understood in relation to what other internet sources have to say about it. To uncover the connection one node has to others on the web, a user enters keywords from the website, such as the name of its sponsor, into a search engine. The resulting SERP reveals the node in context: how other nodes relate to it and, thus, how it can be best understood. Therefore, the networked approach harnesses the power of the web to help internet users evaluate the credibility of a given website.

### *The Checklist and Networked Approaches Compared*

Checklist and networked approaches mainly differ in how they approach the moment when a web user decides whether to engage with a website. The networked approach separates assessments of credibility into two decisions. First, is the website worth further examination? Second, if so, how should one interpret the information on the site? The networked approach recognizes that it is not worthwhile, and in fact actively harmful, to engage with information prior to determining that a site is worthy of further examination. For example, spending time on a misleading website may result in indoctrination into conspiracy theories.<sup>23</sup> On the other

hand, the checklist approach considers credibility assessments as a continuous process: One determines trustworthiness through close reading rather than making an intentional choice about whether such attention is warranted.

Simon argues that “a wealth of information creates a poverty of attention” and necessitates decisions about how to allocate that attention among numerous sources.<sup>24</sup> Such decisions are especially important in today’s saturated information environment. Kozyreva et al. say that, “to manage information overload, one must ignore a large amount of incoming material and separate useful information from noise, false news, or harmful advice.”<sup>25</sup> Therefore, in the context of the modern-day internet, a user makes a critical decision when they determine whether a website is sufficiently trustworthy to merit further consideration. A networked approach focuses on this moment of engagement.

Research has shown that a networked approach leads to substantially different web evaluation strategies and outcomes. Wineburg and McGrew found that professional fact-checkers unanimously came to the right answer on tasks with which students struggled.<sup>26</sup> What did they do differently? They turned to the broader web. Instead of remaining on the website they were investigating for a prolonged period of time, fact-checkers opened up new tabs at the moment of engagement to determine whether the original site should be trusted. Only after determining the credibility of a website did fact-checkers return to the original site to glean information from it, a strategy called “lateral reading.” Educational interventions teaching students to read laterally have yielded positive results.<sup>27</sup>

To illustrate, the background of the Employment Policies Institute (EPI) can be ascertained quickly through the networked approach. Using lateral reading, a web user would open up a new tab and search “Employment Policies Institute.” Skipping the first link on the SERP, which is often to the organization being investigated, one would find multiple sources flagging EPI’s bias as a front group for the restaurant lobby, a group with a vested interest in keeping the minimum wage low. In other words, by harnessing the power of the internet, the user can map the way this particular node—[epionline.org](http://epionline.org)—connects to many other nodes, thus revealing its character. Checklists, on the other hand, prompt the user to undertake a careful examination of the website to determine credibility. As mentioned above, students who carefully examined EPI were also the ones who came to the wrong conclusion.

Among advice offered by librarians, checklists appear more frequently than suggestions to read laterally.<sup>28</sup> Lim’s recent investigation found that, in a largely purposive sample of academic library guides, checklists were the most common tool librarians used to address fake news.<sup>29</sup> The ubiquity of checklists, along with the increasing evidence that a networked approach is more effective in an era of information overabundance, prompted us to examine the prevalence of checklist versus networked approaches when students search for advice from their institution on how to evaluate online sources.

Lim distinguishes checklists by their purpose such as evaluating academic resources versus evaluating news sources. We classify guides by their general approach to initial assessments of credibility on the web. Thus, we focus on the distinction between internal evaluation of a website’s signals and external evaluation via situating a website in a broader matrix of information. As suggested earlier, recent studies point to internal versus external evaluation as determinative of student success in evaluating online information. Students who stay on a webpage struggle.<sup>30</sup> Students who leave that webpage, open a new tab, and see what other, credible sources have to say arrive at better answers in a fraction of the time. Our study,

therefore, prioritizes process-oriented aspects of information literacy such as turning toward external sources prior to close reading.

Having tools to interpret information, such as data analysis skills or an ability to spot bias, is critical. But it is important to know when and where to apply those tools. Just as one must choose a restaurant to dine at before the skill of using utensils becomes relevant, so too must one choose a source of information to consume before interpretive information literacy becomes valuable. We are concerned with this initial choice of consumption or whether a source of information deserves further interpretation. Wherever we use the phrase “evaluate content” we specifically refer to this kind of initial determination of credibility rather than the more comprehensive view of credibility, which includes information interpretation and deeper analysis. The process of turning to external sources to evaluate credibility is consistent across social media, traditional webpages, and more. We therefore treat these subcategories as united under the umbrella of “online information.” For the purposes of this paper, online information can be thought of as any piece of information a student encounters on the internet in any medium of whose veracity a student is unsure.

Overall, given what the research suggests about the difference in effectiveness of networked and checklist approaches, we asked the following research question: When students try to find advice from their academic institution on how to approach information on the internet, to what extent do they find networked versus checklist approaches? We then analyzed the distribution of networked versus checklist approaches in light of universities’ role in preparing students for an increasingly digital age.

## **Methodology**

### ***Sampling Strategy***

This study sampled the websites of 50 leading colleges and universities in the United States, equally dividing our sample between 25 private and 25 public institutions. We restricted the sample to public student-facing resources, excluding advice about web credibility specifically aimed at college instructors.

We only included institutions that provided web credibility advice on a library dedicated page, general university guide, or integrated advice in a course guide easily accessible through Google. In setting these criteria, the guiding principle was the visibility of the resources to students and the relevance of the resources to web credibility. Most of the sample consists of libraries’ websites. However, we did not preclude other sources of advice because our aim was to examine the prevalence of networked versus checklist approaches among institutions rather than solely among libraries. Harvard University, for example, was included in the sample even though the guide came from the college’s writing program. We made this choice because this advice was the most visible resource students would find when searching for guidance on the open web. Overall, our sample indicates that librarians are the ones who most frequently provide advice on evaluating information. However, this was not exclusively the case.

### ***Generating the Sample***

We generated the sample by copying into an Excel spreadsheet the names of the top 100 ranked private and top 100 ranked public universities from the Times Higher Education/Wall Street Journal (2019) rankings.<sup>31</sup> We applied a randomization algorithm to choose data points from the list and repeated the process until we had 25 unique private and 25 unique public institu-

tions (see table 1 for the final list of institutions and the appendix for links to their resources). If we were unable to find that an institution included information specifically for evaluating internet sources, it was excluded. For example, while Williams College offered an “Evaluating Sources Page” with advice on “what to think about when assessing your sources,” there was no indication that this guide applied to evaluating web sources.<sup>32</sup> It was thus excluded.

We used a large random sample to gain a broader picture of the advice students find from their academic institution when they seek guidance for how to evaluate online information. The size of our sample (n = 50) and method of random sampling make it more likely that our results are representative and free from third-variable influence than smaller samples that are obtained mostly purposively. In addition, we focus on the kind of advice students most easily find from their institution rather than trying to catalogue the entirety of that university’s resources.

We used multiple strategies to find what information an institution provided students about web credibility. We first searched the name of the institution with the key phrase “source evaluation.” Often these keywords returned relevant search results with links from the given

**TABLE 1**  
**Institutions Included in Final Data Sample**

<b>Private Colleges</b>	<b>Public Colleges</b>
Yale University	Rutgers University
Carleton College	Stony Brook University
Brandeis University	Pennsylvania State University
Washington University in St. Louis	Stockton University
University of Richmond	Binghamton University, State University of New York
Boston College	University of Delaware
Northwestern University	Virginia Commonwealth University
Cornell University	Indiana University (Bloomington)
Drexel University	The College of New Jersey
Dickinson College	University of Colorado Denver
Stanford University	University of Texas at Austin
Wesleyan University	University of Washington—Bothell
University of Notre Dame	Rowan University
Creighton University	University of Pittsburgh
University of Denver	University of Wisconsin
Grinnell College	San Diego State University
Middlebury College	Miami University
Bucknell University	United States Military Academy (West Point)
Massachusetts Institute of Technology	Temple University
Saint Louis University	George Mason University
Hamilton College	University of California, San Diego
Duke University	Oregon State University
Santa Clara University	University of Tennessee
Princeton University	University of California Santa Barbara
Harvard University	University of Cincinnati

college or university about online source evaluation. However, we varied terms as needed when there were no relevant search results, replacing *source evaluation* with *fake news*, *how to evaluate sources*, or *source credibility*. In the cases where keyword manipulation still did not lead us to relevant resources, we went directly to the university's library website and navigated within the site itself. Out of the sample of 50 institutions, 43 were provided by libraries as general guides, four were integrated into course guides, and three were published by the English or Composition departments of an institution.

Our focus on student-facing guides meant we did not reach out to any institution to request resources. It is possible that, in at least some cases, we did not find what an institution would describe as its best or what is objectively the most recent advice it gives on web credibility. However, resources that are not easily surfaced via Google or the institution's web page are also less likely to be seen and used by students: Research shows that internet users tend to look at the first link on the Google SERP.<sup>33</sup> We mainly conceived of visibility as the highest link on the SERP that provided an institution's advice on evaluating online sources. When we navigated within an institution's web page to find a guide, visibility meant choosing the highest relevant link from an internal site search or accessing resources that were prominently displayed on the library homepage. Our prioritization of visibility and accessibility to students in such cases does not discount the potentially great resources offered by institutions elsewhere. Rather, it recognizes that students cannot be properly guided by advice that they cannot easily find.

### *Coding Scheme and Reliability Testing*

After an initial survey of the institutions, we developed a coding scheme that focused on internal versus external evaluation via an adaption of open coding.<sup>34</sup> Any kind of advice that directed students to look at a website's internal features prior to external examination would qualify as "internal evaluation." This included but was not limited to: advice to evaluate a website's design, domain, About page, or links and references. External evaluation was any kind of advice that directed students to leave the website they were evaluating to ascertain its credibility. This included but was not limited to: advice to see what other sources have to say about the organization being investigated, advice to investigate the author's reputation, as well as advice to search for more information on the specific claims being made. We also coded for common resources. All institutions were evaluated between May 2019 and April 2020. As such, our study offers a snapshot of the resources students would find in this period of time. Backups of institutions' advice can be found through Internet Archive or via screenshots taken by the authors.

In the process of developing a coding scheme, two coders underwent two practice rounds of coding to test reliability, sharpen coding criteria, and discuss border cases. One round involved five institutions from within the sample of 50. Another round involved five institutions that were chosen randomly and not included in the final sample of the study. Following these two practice coding rounds, two coders independently evaluated 20 percent ( $n = 10$ ) of the sample for a formal reliability test, reaching 100 percent agreement on characterizing the type of web credibility and its consistency or inconsistency.

## **Results**

Nearly every institution (48/50, or 96%) featured checklist approaches either on their landing page or in links to other sites. Checklist approaches shared a common orientation toward the

nature of online information and web credibility, namely an emphasis on internal evaluation of a website's signals. However, they differed in the amount and types of resources offered.

Our coding scheme focused on the extent to which college and university resources in our sample offered networked and checklist advice for how to initially approach an unfamiliar site. Institutions that featured solely checklist or networked approaches for the moment of engagement were in the minority. Most colleges and universities featured a combination of both approaches. When both networked and checklist advice was present, we examined whether institutions differentiated when to employ which approach.

**TABLE 2**  
**Summary of Results Comparing Networked and Checklist Approaches**

Category	Percentage of Sample within Category
Consistent Checklist	40%
Inconsistent (Checklist and Networked)	56%
Consistent Networked Approach	4%

### *Consistent Checklist Approach*

Forty percent of college and university websites only provided students with checklist strategies to determine a website's credibility.

For example, Northwestern University's library website presented students with two checklists to use in evaluating sources. The first checklist, ACT UP (Authority, Currency, Truth, Unbiased, Privilege), offered 15 questions a student should consider. These ranged from "who (person, organization, company) created the source?" to "does the point of view appear objective or biased?" and "is there a bibliography?"<sup>35</sup> Northwestern stated that these criteria "work for all formats," including books, websites, articles, and more.

Yale University also adopted a checklist approach. Their checklist, drawing on content from the University of Maryland and University of Dallas, had students check off the domain of the website they were investigating, such as dot-com (a company), dot-edu (academic institution), and dot-org (nonprofit organization). Other criteria directed students to the site's design, the organization of the webpage's features, the frequency of updates, and whether the site provides "any contact information or means of communicating with the author or webmaster." Yale did not provide a rubric to translate the above features into a final credibility assessment.<sup>36</sup>

Consistent checklist institutions generally adopted a similar approach as Northwestern and Yale. While the precise wording of the questions might differ, checklists across institutions emphasized on-the-page evaluation.

### *Dangers of the Internet*

Besides offering checklists for students to evaluate the credibility of information online, some institutions emphasized the dangers of the internet. Harvard University, in a section titled "What's Wrong with Wikipedia?" urged students to be leery of the free encyclopedia because "information on Wikipedia is contributed by anyone who wants to post material," and that instead, "Harvard librarians can point you to specialized encyclopedias in different fields."<sup>37</sup>

Yale, too, exhorted students to use databases and print resources. At the top of their guide on web credibility, Yale contrasted library databases with the open web, pushing students



to rely on the former. Yale suggested that using the internet to search was more trouble than it was worth, leaving a student with “lots of junk to wade through.” A database, however, would give students prevetted results, a valuable resource that was available free of charge for the remainder of their time at the institution.<sup>38</sup>

West Point contrasted how print sources “go through an extensive publication process that includes editing and article review,” while online, “anyone with a computer and access to the Internet can publish a Web site or electronic document.” West Point’s “Online Sources” tab did not include specific strategies for determining a particular website’s credibility in the kind of information landscape that they warn about.<sup>39</sup> This is similar to Northwestern’s ACT UP checklist, which advised students to consider “How accurate is the information?” but did not explain to students how to make this determination on the Web.<sup>40</sup>

### Relevance vs. Reliability

Finally, some checklists, such as Northwestern’s version of CRAAP, suggested that the relevance of information to a student’s research project is a key consideration in determining credibility. Similarly, Wesleyan University provided a list of 29 bulleted questions to help students “evaluate how relevant and reliable [their sources] are.”<sup>41</sup> Wesleyan was coded as inconsistent because it offered some networked advice, but the conflation of relevance and reliability fits under the umbrella of the checklist approach.

### *Inconsistent Approach*

The majority of institutions in our sample (56%) provided students with a combination of networked and checklist approaches. Some colleges and universities presented both approaches on their landing pages or within a checklist. For others, the inconsistency was the result of mixed messages provided by advice on their landing page and the resources to which they linked.

Several institutions presented conflicting approaches on the same page. The University of Texas at Austin’s landing page explained lateral reading and reminded students that “sometimes you can find out more about a website by leaving the site itself” and that “just because a website looks credible doesn’t mean that it is.”<sup>42</sup> The librarian provided students with the key points from Wineburg and McGrew’s scholarly article.<sup>43</sup> However, below the section on lateral reading, UT Austin’s page offered “Evaluation Criteria” containing the CRAAP test.

Some institutions had checklists that contained networked advice within the checklist. Wesleyan University, for example, presented students with a checklist similar to the CRAAP test.<sup>44</sup> The checklist tells students to examine the URL of the page to identify the type of site and thereby make an inference as to its credibility. At the same time, it included two questions that prompted students to leave a website to determine its trustworthiness. Wesleyan’s section “Who is the author?” included the following question: “For more information on an author, ask your professor, do an Internet search, or look in the database Contemporary Authors or some other biographical reference source.” This question was embedded within a checklist, but it incorporated a networked orientation to the Web. That said, networked questions represented only two of 29 questions in the checklist.

Colleges and universities that were consistent in offering a checklist or a networked approach on their landing page often linked to strategies inconsistent with their chosen approach. The College of New Jersey’s landing page coached students to “look at the top-level domain” and the author/About Page to determine a website’s credibility.<sup>45</sup> However, they also linked to

a resource from the International Federation of Library Associations (IFLA) that presented a networked approach to web evaluation (see “Other Resources” section). The graphic directed students to navigate away from the initial website to “investigate the site, its mission, and its contact info” as well as to determine the author’s credentials.

Another institution, Middlebury College, featured Caulfield’s SIFT technique (Stop, Investigate the Source, Find better coverage, Trace claims, quotes, media to original context), a networked approach, at the top of its “Techniques for Evaluating the Web” landing page.<sup>46</sup> But there was also a link to the checklist-style CRAAP Test from CSU Chico. Colleges and universities in this category did not offer guidance on when to use SIFT or lateral reading versus when to use CRAAP.

### *Consistent Networked Approach*

A networked approach gave students strategies on how to leverage the broader web to evaluate credibility. For an institution to be considered consistently networked, it had to provide exclusively networked advice on its landing page and in links to other institutions. Among the sample of 50, only two, Rowan University and the University of Tennessee, Knoxville, offered students consistently networked advice.

Drawing on SIFT and lateral reading, Rowan’s guide, created by Andrea Baer and Dan Kipnis, helped students determine if a source was worth their time before they read it carefully.<sup>47</sup> Rowan positioned lateral reading as the necessary precursor to the close, interpretive reading that forms the bulk of traditional information literacy advice. It advised students to investigate an unknown site by checking for previous work, finding the original source of information, reading laterally, and circling back. After giving advice on how to determine if a site is worth their time, Rowan offers students tools to engage with the information that the site provides. Rowan differentiates between information literacy strategies to use when landing on an unfamiliar site versus the ones to use after that site’s credibility has been determined externally. UT Knoxville qualified for a consistently networked approach by embedding the IFLA Infographic on its source evaluation page.<sup>48</sup>

### *Most Used Resources*

The diversity and breadth of resources that institutions incorporated demonstrate a couple of facts: 1) universities compiled a mixed bag of resources, both checklist and networked, often without differentiating when to use which; and 2) these resources were often dated.

### *Mixed Bag*

A total of 18 percent of institutions linked to or embedded the IFLA graphic, which offers networked advice and is one-third as long as CSU Chico’s CRAAP test. However, the context in which this graphic was presented mattered. For example, some institutions, such as the University of Tennessee, Knoxville, offered IFLA as the primary source of advice for students. Others, such as The College of New Jersey, offered IFLA alongside numerous other sources of information.<sup>49</sup> Nearly one-third (32%) of institutions linked to fact-checking resources such as PolitiFact or Snopes. Rarely, however, were these resources prioritized. For example, Cornell University included links to “Four Reliable News Fact-Checking Sites” under a tab on how to “Be an Active News User.” However, this was one of 16 tabs on the landing page, each of which contained multiple links.<sup>50</sup> While CRAAP checklists and the IFLA infographic were

often central to a college or university’s instructional approach, fact-checking resources were frequently supplemental.

### Outdated Resources

Only 14 percent of institutions in our sample linked to the CRAAP test developed by a librarian at Meriam Library at Cal State University, Chico. CRAAP and CSU Chico’s influence are likely greater than our sample revealed. Many colleges and universities featured near-identical checklists without direct attribution. Stockton University, for example, had a modified version of the CRAAP Test without any citations to CSU Chico.<sup>51</sup> Other colleges that were frequently linked include Cornell, Berkeley, and Stony Brook.

This happened with resources other than CRAAP as well. Colleges and universities often embedded sources from other organizations or institutions onto their landing pages, sometimes without attribution. For example, Stony Brook University and the University of Delaware featured an identical screenshot of a webpage with tips on source evaluation that was developed by Indiana University East. But only the University of Delaware had a citation. An absence of citations means the influence of all of the resources in this section may be greater than the percentage discovered in our sample.

Eight percent of our sample included links to or citations of dated research articles from the internet’s early days that reinforce a checklist approach. A Princeton University guide to web credibility, for example, cited a 1998 article by Jim Kapoun entitled “Teaching Undergrads WEB Evaluation: A Guide for Library Instruction” as the basis for its suggestions.<sup>52</sup>

Sixteen percent of institutions linked to Melissa Zimdars’ “False, Misleading, Clickbait-y, and Satirical ‘News’ Sources,” an effort to develop lists of sites that offer poor-quality information.<sup>53</sup>

Zimdars, a professor of communication and media at Merrimack College, encouraged students to check the URL of the site they are investigating against an extensive—though not necessarily exhaustive—list of fake news sites. She broke down fake news into several categories and gave a table of more than 100 sites of which students should be wary. Last updated in 2016, several of the sites in her list like “abcnews.com.co” or “70news.wordpress.com” are no longer active, which Zimdars acknowledges.

In several cases, such as Binghamton University, Oregon State University, and Hamilton College, links to other resources were broken.<sup>54</sup>

**TABLE 3**  
**Summary of Most Used Resources**

Name of Resource	Percent of Sample that Links to Resource
IFLA Infographic	18%
Fact-Checking Websites	32%
CRAAP Test from Meriam Library at Cal State University	14%
Dated Research Articles	8%
Melissa Zimdars’ “False, Misleading, Clickbaity-y”	16%

### Discussion

The internet is an indispensable feature of college life, but ample research shows that many

college students need help distinguishing quality from dubious information.<sup>55</sup> Our results indicate that the web credibility advice students find often does not reflect emerging best practices of turning to external sources before engaging in close reading.

Most institutions in our sample prompted students to determine credibility by evaluating a website internally. However, internal signals such as website domain, contact information, or design can be manipulated. Advice to read a website closely reflects longstanding approaches to evaluating print sources. While many institutions acknowledged the unique dangers of the internet, not all of them offered students specific strategies for navigating those dangers.

Overall, our research suggests that colleges and universities need to do more to help students learn how to evaluate the credibility of online information. In particular, advice about web evaluation should differentiate between initial assessments of credibility via external sources and subsequent close reading. Institutions must ensure the resources they create for students communicate when each approach is warranted. More than half (56%) of institutions included networked approaches. But only 4 percent advised students to look externally *before* close reading.

### *Internet-Specific Advice*

Colleges and universities frequently tried to tailor their advice to unique aspects of the internet. For example, several institutions offered students guidance on the use of Wikipedia. The University of Colorado, Denver told students that “there’s no ranking system which lets certain authors edit some pages and not others.”<sup>56</sup> In fact, Wikipedia maintains different kinds of protected pages—the most trafficked and subject to vandalism can only be changed by the highest-ranking Wikipedia editors.<sup>57</sup> Professional fact-checkers frequently turn to Wikipedia as a resource to determine the credibility of a particular website or organization.

Students are also taught to imbue trust in dot-org websites. Many institutions suggested students should pay attention to a site’s domain. Some, including Harvard University and Yale University, said dot-orgs are nonprofits, which could have the unintended consequence of making students think they are trustworthy. In reality, anyone can acquire a dot-org domain, including 49 percent of hate groups. Nor does nonprofit status guarantee that an organization provides credible information.<sup>58</sup>

Students who internalize that they can trust dot-orgs on faith make mistakes with serious consequences. A recent study asked a nationally representative sample of 3,446 high school students to evaluate [co2science.org](http://co2science.org), a site that denies human-induced climate change and is funded by the fossil fuel industry. Nearly all (96%) of them failed to uncover the site’s ties to its corporate sponsors.<sup>59</sup> In many cases, the power of the dot-org domain swayed their decisions. “This page is a reliable source to obtain information from, you see in the URL that it ends in .org as opposed to .com,” one student wrote.<sup>60</sup> Other signals that influenced students’ decisions were a site’s design and graphics, the presence or absence of contact information, and the accuracy of spelling and grammar. In 2021, however, these signals are easily manipulated. Anyone can create a professional looking website that is easy to use and features contact information. Therefore, teaching these signals as a metric for credibility does not help students make good decisions on the internet.

### *Dated Information*

Research has shown that the web demands a new kind of reading that prioritizes external

verification over the internal close reading employed when evaluating traditional print sources. Institutions in our sample did not always convey this new approach. For example, one of the pieces of advice in an extensive guide offered by Massachusetts Institute of Technology was that evaluating the credibility of information online requires close reading skills: “While you may not feel qualified to judge research in areas that are unfamiliar to you, evaluating information involves little more than being critical of what you read and using a little common sense.”<sup>61</sup> However, even very smart people can be fooled by dwelling too long on an unfamiliar website.<sup>62</sup> Asked to determine which of two sites gave better advice on adolescent bullying, the nationally recognized American Academy of Pediatrics or the fringe, anti-LGBT American College of Pediatricians, 64 percent of Stanford undergraduates thought the College gave better advice. Fully 40 percent of PhD historians, drawn from five different institutions, equivocated when trying to make a determination. These intelligent people didn’t struggle because they failed to read closely. They struggled because they did.<sup>63</sup>

Professional fact-checkers, however, unanimously identified the American Academy of Pediatrics as credible and the American College of Pediatricians as suspicious. Unlike the historians or students, professional fact-checkers turned to the network, leaving the organizations’ landing pages and opening new tabs across the horizontal axis of their browser window to see what other trustworthy sites had to say about each group. They leveraged Wikipedia as a resource. And they did not automatically click on the first link on the Google SERP, instead engaging in “click restraint” and making an intentional and intelligent choice about which resources to open first.<sup>64</sup>

Networked interventions using Caulfield’s Four Steps, click restraint, lateral reading, and encouraging the use of Wikipedia yielded substantial improvements in students’ ability to evaluate the credibility of information online. An experimental curriculum run by the Digital Polarization Initiative resulted in “significant gains in [the use of] fact-checking strategies, including greater use of Wikipedia to verify information” compared to a control group.<sup>65</sup> A study that the Stanford History Education Group ran at San Jose State University, comparing students who were taught a networked approach to a control group, achieved similar gains.<sup>66</sup> In our review of existing research, we were unable to surface any comparable interventions that improved students’ online reasoning based on the CRAAP test and other checklist-based approaches.<sup>67</sup>

### ***Instructional Design, the Problem with Checklists, and Librarians’ Role***

We found that the majority of colleges and universities (56%) combined checklist approaches with networked ones without saying when to use which. When networked advice is presented alongside close reading strategies, it becomes difficult for a student unfamiliar with best practices to know the appropriate time to employ a given approach. The same is true when resources such as fact-checking websites are included among dozens of other links. Instructional design should help students understand the purpose and limitations of the different resources colleges and universities provide.

### ***Limitations and Areas for Future Research***

Our study has limitations that constrain the scope of the conclusions drawn. It consisted exclusively of institutions within the United States drawn from the Times Higher Education/Wall Street Journal (2019) rankings of top private and public institutions. Without international

comparisons or a broader sample, it is not possible to conclusively determine whether the same trends apply to colleges and universities writ large. Nor do we have data on the usage of these web-based materials or the extent to which college students internalize advice if and when they interact with them. Finally, by limiting our study to student-facing resources available on the open web, we leave out other curriculum interventions students may receive on evaluating the credibility of information on the internet, as well as resources that are not easily found through a Google search.

Opportunities for future studies include researching how professionals make decisions about what to include in guides for students, in particular how they adapt to evolving best practices and update their guides over time. In addition, it would be worthwhile to observe how students interact with these online resources, seeing what they pay attention to in the hopes of clarifying how updated content can be combined with effective instructional design to produce useful guides. Finally, updates to the advice students find from institutions suggest it may be valuable to redo a similar study down the line to identify trends in data over time.

## Conclusion

By virtue of their inclusion in our sample, all of the colleges and universities we studied made some attempt at preparing students to sort fact from fiction online. But our results suggest that the status quo of web credibility instruction needs to be reimaged.

The internet is where students turn for the information they use to make personal, familial, and political decisions. Their ability to evaluate credibility on the web should therefore be a priority—especially as a global pandemic forced an even stronger pivot toward technology in every aspect of students' lives.

It is encouraging that a majority of institutions featured some sort of networked advice, even if that advice was presented in conjunction with checklist-style approaches. Librarians, teaching faculty, and every member of the university community need to collaborate to ensure that the next generation of leaders have the tools they need to be effective consumers of online information. To this end, there are several immediate steps that institutions and librarians might take to help students better discern fact from fiction online.

First, institutions should remove advice that is either incorrect or no longer applies to the internet of 2022. Suggesting that a dot-org domain indicates social good is not sound advice. Nor is it wise to examine a site's design in an age when it is easy to produce a good-looking website. These kinds of directives must be removed to avoid misleading students.

Second, institutions should follow the example of Rowan University and sequence networked and checklist approaches. Institutions should make clear that initial, external evaluation of a website's credibility must precede internal, close-reading evaluation. Both approaches—external evaluation and close reading—are important. But they are only effective when properly sequenced.

Lateral reading, the key mechanism of external evaluation, is an effective and flexible heuristic. It does, however, presume that when students conduct an internet search, they know which sources they can trust to triangulate. Therefore, preparing students for a digital age will require instruction on what makes a source credible.

There may also be room for pedagogical experimentation by librarians. We know that the networked approach is superior in terms of outcomes in evaluating information. Recent studies have shown that small interventions in the classroom setting can yield substantial

improvements in students' digital savvy. However, there is less certainty about best practices in teaching the networked approach via online resources as well as the durability of improvements from targeted interventions. Librarians can take up this still-emerging field of research to try different approaches to teaching students the networked approach, adjusting instructional time, format, follow-up, and more. For example, researchers could examine how students interact with and learn from resource guides online. This experimentation may prove crucial in helping bridge a research-based understanding of the networked approach to practical applications in colleges and universities.

### **Acknowledgments**

We would like to express our deep appreciation to Professor Sam Wineburg for his continuous, invaluable mentorship along every step of this paper. We would not have been able to complete this project without him.

## APPENDIX. Links to Institutions in Sample

**Note on Links:** The nature of the internet means data is prone to rapid change. Most of the sites remain the same or nearly the same as when we collected them. However, several are no longer up or have been revised since the time of data collection. Internet Archive WayBack Machine links are provided when possible to illustrate the data included in the sample.

<b>APPENDIX</b>	
<b>Links to Institutions Included in Final Data Sample</b>	
Institution	Link
Yale University	<a href="https://web.archive.org/web/20200414172811/https://www.library.yale.edu/researcheducation/pdfs/Searching_Evaluating_Resources.PDF">https://web.archive.org/web/20200414172811/https://www.library.yale.edu/researcheducation/pdfs/Searching_Evaluating_Resources.PDF</a>
Carleton College	<a href="http://web.archive.org/web/20200407210856/https://gouldguides.carleton.edu/currentevents">http://web.archive.org/web/20200407210856/https://gouldguides.carleton.edu/currentevents</a>
Brandeis University	<a href="http://web.archive.org/web/20200407210932/https://guides.library.brandeis.edu/evaluatinginfo/web-and-social-media">http://web.archive.org/web/20200407210932/https://guides.library.brandeis.edu/evaluatinginfo/web-and-social-media</a>
Washington University in St. Louis	<a href="https://libguides.wustl.edu/c.php?g=46980&amp;p=301909">https://libguides.wustl.edu/c.php?g=46980&amp;p=301909</a>
University of Richmond	<a href="http://web.archive.org/web/20200407211040/http://libguides.richmond.edu/c.php?g=260944&amp;p=1743264">http://web.archive.org/web/20200407211040/http://libguides.richmond.edu/c.php?g=260944&amp;p=1743264</a>
Boston College	<a href="http://web.archive.org/web/20200407211210/https://libguides.bc.edu/c.php?g=44018&amp;p=279570">http://web.archive.org/web/20200407211210/https://libguides.bc.edu/c.php?g=44018&amp;p=279570</a>
Northwestern University	<a href="http://web.archive.org/web/20200407211523/https://libguides.northwestern.edu/evaluatingresources">http://web.archive.org/web/20200407211523/https://libguides.northwestern.edu/evaluatingresources</a>
Cornell University	<a href="http://web.archive.org/web/20200318124050/http://guides.library.cornell.edu/c.php?g=32334&amp;p=203767">http://web.archive.org/web/20200318124050/http://guides.library.cornell.edu/c.php?g=32334&amp;p=203767</a> ; <a href="http://web.archive.org/web/20200422112431/http://guides.library.cornell.edu/evaluate_news/fakenews">http://web.archive.org/web/20200422112431/http://guides.library.cornell.edu/evaluate_news/fakenews</a> ; <a href="http://web.archive.org/web/20200418084251/http://guides.library.cornell.edu/critically_analyzing">http://web.archive.org/web/20200418084251/http://guides.library.cornell.edu/critically_analyzing</a>
Drexel University	<a href="http://web.archive.org/web/20200407211732/https://libguides.library.drexel.edu/fake_news">http://web.archive.org/web/20200407211732/https://libguides.library.drexel.edu/fake_news</a>
Dickinson College	<a href="http://web.archive.org/web/20200407211806/http://libguides.dickinson.edu/researchprocess/websiteeval">http://web.archive.org/web/20200407211806/http://libguides.dickinson.edu/researchprocess/websiteeval</a>
Stanford University	<a href="http://web.archive.org/web/20200407211827/https://www.youtube.com/watch?v=bZ122WakNDY">http://web.archive.org/web/20200407211827/https://www.youtube.com/watch?v=bZ122WakNDY</a>
Wesleyan University	<a href="http://web.archive.org/web/20200407211937/https://libguides.wesleyan.edu/c.php?g=393439&amp;p=2672641">http://web.archive.org/web/20200407211937/https://libguides.wesleyan.edu/c.php?g=393439&amp;p=2672641</a>
University of Notre Dame	<a href="http://web.archive.org/web/20200407212100/https://potofgold.library.nd.edu/evaluating/">http://web.archive.org/web/20200407212100/https://potofgold.library.nd.edu/evaluating/</a>
Creighton University	<a href="http://web.archive.org/web/20200407212125/http://www.creighton.edu/reinert/researchtoolbox/tutorialsandguides/thefivews/">http://web.archive.org/web/20200407212125/http://www.creighton.edu/reinert/researchtoolbox/tutorialsandguides/thefivews/</a>
University of Denver	<a href="http://web.archive.org/web/20200408003843/http://libguides.du.edu/c.php?g=622586&amp;p=4336814">http://web.archive.org/web/20200408003843/http://libguides.du.edu/c.php?g=622586&amp;p=4336814</a>



<b>APPENDIX</b>	
<b>Links to Institutions Included in Final Data Sample</b>	
Institution	Link
Grinnell College	<a href="https://www.grinnell.edu/academics/libraries/students/doing-research?v2node">https://www.grinnell.edu/academics/libraries/students/doing-research?v2node</a>
Middlebury College	<a href="https://middlebury.libguides.com/internet/techniques-web">https://middlebury.libguides.com/internet/techniques-web</a>
Bucknell University	<a href="http://web.archive.org/web/20200408004115/https://researchbysubject.bucknell.edu/evaluatingnews">http://web.archive.org/web/20200408004115/https://researchbysubject.bucknell.edu/evaluatingnews</a>
Massachusetts Institute of Technology	<a href="http://web.archive.org/web/20200408004317/https://libguides.mit.edu/c.php?g=382302&amp;p=2590435">http://web.archive.org/web/20200408004317/https://libguides.mit.edu/c.php?g=382302&amp;p=2590435</a>
Saint Louis University	<a href="https://libguides.slu.edu/c.php?g=185593&amp;p=1227639">https://libguides.slu.edu/c.php?g=185593&amp;p=1227639</a>
Hamilton College	<a href="http://web.archive.org/web/20200408005148/http://libguides.hamilton.edu/c.php?g=622975&amp;p=4339597">http://web.archive.org/web/20200408005148/http://libguides.hamilton.edu/c.php?g=622975&amp;p=4339597</a> ; <a href="http://web.archive.org/web/20200414184027/https://libguides.hamilton.edu/c.php?g=622975&amp;p=4339599">http://web.archive.org/web/20200414184027/https://libguides.hamilton.edu/c.php?g=622975&amp;p=4339599</a>
Duke University	<a href="https://guides.library.duke.edu/c.php?g=902788&amp;p=6497823">https://guides.library.duke.edu/c.php?g=902788&amp;p=6497823</a>
Santa Clara University	<a href="http://web.archive.org/web/20200408004520/https://scufactchecking.wixsite.com/home">http://web.archive.org/web/20200408004520/https://scufactchecking.wixsite.com/home</a>
Princeton University	<a href="http://web.archive.org/web/20200408004728/https://libguides.princeton.edu/c.php?g=84018&amp;p=664970">http://web.archive.org/web/20200408004728/https://libguides.princeton.edu/c.php?g=84018&amp;p=664970</a>
Harvard University	<a href="http://web.archive.org/web/20200408004752/https://usingsources.fas.harvard.edu/evaluating-web-sources">http://web.archive.org/web/20200408004752/https://usingsources.fas.harvard.edu/evaluating-web-sources</a>
Rutgers University	<a href="http://web.archive.org/web/20200408005513/https://libguides.rutgers.edu/fake_news">http://web.archive.org/web/20200408005513/https://libguides.rutgers.edu/fake_news</a>
Stony Brook University	<a href="http://web.archive.org/web/20200408005552/https://guides.library.stonybrook.edu/fakenews/resources">http://web.archive.org/web/20200408005552/https://guides.library.stonybrook.edu/fakenews/resources</a>
Pennsylvania State University	<a href="http://web.archive.org/web/20200408005722/https://libraries.psu.edu/services/research-help/evaluating-information">http://web.archive.org/web/20200408005722/https://libraries.psu.edu/services/research-help/evaluating-information</a>
Stockton University	<a href="http://web.archive.org/web/20200408005740/https://library.stockton.edu/c.php?g=830109&amp;p=5926889">http://web.archive.org/web/20200408005740/https://library.stockton.edu/c.php?g=830109&amp;p=5926889</a>
Binghamton University, State University of New York	<a href="http://web.archive.org/web/20200408005847/https://www.binghamton.edu/libraries/research/guides/web-page-checklist.html">http://web.archive.org/web/20200408005847/https://www.binghamton.edu/libraries/research/guides/web-page-checklist.html</a>
University of Delaware	<a href="http://web.archive.org/web/20200408005722/https://libraries.psu.edu/services/research-help/evaluating-information">http://web.archive.org/web/20200408005722/https://libraries.psu.edu/services/research-help/evaluating-information</a>
Virginia Commonwealth University	<a href="http://web.archive.org/web/20200408010127/https://guides.library.vcu.edu/evaluate">http://web.archive.org/web/20200408010127/https://guides.library.vcu.edu/evaluate</a>
Indiana University (Bloomington)	<a href="http://web.archive.org/web/20200408010132/https://iupui.libguides.com/howtoresearch/evaluate-sources">http://web.archive.org/web/20200408010132/https://iupui.libguides.com/howtoresearch/evaluate-sources</a>
The College of New Jersey	<a href="http://web.archive.org/web/20200408010156/https://libguides.tcnj.edu/evaluate">http://web.archive.org/web/20200408010156/https://libguides.tcnj.edu/evaluate</a>
University of Colorado Denver	<a href="http://web.archive.org/web/20200408010415/https://guides.auraria.edu/evaluating-sources">http://web.archive.org/web/20200408010415/https://guides.auraria.edu/evaluating-sources</a>

<b>APPENDIX</b>	
<b>Links to Institutions Included in Final Data Sample</b>	
Institution	Link
University of Texas at Austin	<a href="http://web.archive.org/web/20200408010441/https://guides.lib.utexas.edu/c.php?g=539372&amp;p=6876271">http://web.archive.org/web/20200408010441/https://guides.lib.utexas.edu/c.php?g=539372&amp;p=6876271</a>
University of Washington—Bothell	<a href="http://web.archive.org/web/20200408010545/https://guides.lib.uw.edu/bothell/evaluatingsources">http://web.archive.org/web/20200408010545/https://guides.lib.uw.edu/bothell/evaluatingsources</a>
Rowan University	<a href="http://web.archive.org/web/20200408010600/https://libguides.rowan.edu/c.php?g=942045&amp;p=6792400">http://web.archive.org/web/20200408010600/https://libguides.rowan.edu/c.php?g=942045&amp;p=6792400</a>
University of Pittsburgh	<a href="http://web.archive.org/web/20200408010623/https://www.library.pitt.edu/evaluating-web-resources">http://web.archive.org/web/20200408010623/https://www.library.pitt.edu/evaluating-web-resources</a>
University of Wisconsin	<a href="http://web.archive.org/web/20200408010847/https://cms.library.wisc.edu/www/wp-content/uploads/sites/2/2020/03/Evaluation_Tip_Sheet.pdf">http://web.archive.org/web/20200408010847/https://cms.library.wisc.edu/www/wp-content/uploads/sites/2/2020/03/Evaluation_Tip_Sheet.pdf</a> ; <a href="http://web.archive.org/web/20200408010901/https://mediaspace.wisc.edu/media/Identifying+Fake+News/1_30oihj1f/26292342">http://web.archive.org/web/20200408010901/https://mediaspace.wisc.edu/media/Identifying+Fake+News/1_30oihj1f/26292342</a> ; <a href="https://web.archive.org/web/20200816232706/https://researchguides.library.wisc.edu/c.php?g=640444&amp;p=4485002">https://web.archive.org/web/20200816232706/https://researchguides.library.wisc.edu/c.php?g=640444&amp;p=4485002</a>
San Diego State University	<a href="http://web.archive.org/web/20200408010959/https://library.sdsu.edu/research-services/news/evaluate-your-sources">http://web.archive.org/web/20200408010959/https://library.sdsu.edu/research-services/news/evaluate-your-sources</a>
Miami University	<a href="http://web.archive.org/web/20200408011001/https://www.ham.miamioh.edu/library/start-researching/research-tips/evaluating-websites/">http://web.archive.org/web/20200408011001/https://www.ham.miamioh.edu/library/start-researching/research-tips/evaluating-websites/</a>
United States Military Academy (West Point)	<a href="http://web.archive.org/web/20200408011030/https://usma.libguides.com/workingwithsources/evaluatesources">http://web.archive.org/web/20200408011030/https://usma.libguides.com/workingwithsources/evaluatesources</a>
Temple University	<a href="http://web.archive.org/web/20200408011036/https://guides.temple.edu/c.php?g=646455&amp;p=4534968">http://web.archive.org/web/20200408011036/https://guides.temple.edu/c.php?g=646455&amp;p=4534968</a>
George Mason University	<a href="http://web.archive.org/web/20200408011133/https://vle.credoreference.com/george-mason/evaluating-sources">http://web.archive.org/web/20200408011133/https://vle.credoreference.com/george-mason/evaluating-sources</a>
University of California, San Diego	<a href="http://web.archive.org/web/20200408011153/https://ucsd.libguides.com/preuss/webeval">http://web.archive.org/web/20200408011153/https://ucsd.libguides.com/preuss/webeval</a>
Oregon State University	<a href="http://web.archive.org/web/20200408011222/https://guides.library.oregonstate.edu/c.php?g=286081&amp;p=1904942">http://web.archive.org/web/20200408011222/https://guides.library.oregonstate.edu/c.php?g=286081&amp;p=1904942</a>
University of Tennessee	<a href="http://web.archive.org/web/20200408011353/https://libguides.utk.edu/c.php?g=988050&amp;p=7156151">http://web.archive.org/web/20200408011353/https://libguides.utk.edu/c.php?g=988050&amp;p=7156151</a>
University of California Santa Barbara	<a href="http://web.archive.org/web/20200408011459/http://transcriptions-2008.english.ucsb.edu//resources/guides/learning/evaluating_citing.asp">http://web.archive.org/web/20200408011459/http://transcriptions-2008.english.ucsb.edu//resources/guides/learning/evaluating_citing.asp</a>
University of Cincinnati	<a href="http://web.archive.org/web/20200408015625/https://guides.libraries.uc.edu/engl1001/evaluate">http://web.archive.org/web/20200408015625/https://guides.libraries.uc.edu/engl1001/evaluate</a> ; <a href="http://web.archive.org/web/20200408015654/https://guides.libraries.uc.edu/c.php?g=222564&amp;p=1472911">http://web.archive.org/web/20200408015654/https://guides.libraries.uc.edu/c.php?g=222564&amp;p=1472911</a>

## Notes

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