

*Making moves:
Lateral reading and strategic thinking during digital source evaluation*

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ABSTRACT

Using screencasting videos as think-alouds, this case study explores the process three high school seniors used when tasked with evaluating digital sources. Drawing from dual level theory of literacy, the study explores the complexities involved when students are asked to conduct informal research of their source (a strategy called lateral reading) in order to improve their ability to uncover potential bias in digital sources. Results indicate that lateral reading encouraged healthy reader skepticism and slowed readers down in the review, but students lacked sophisticated online reading and research strategies.

Keywords: *lateral reading, online source evaluation, new literacy.*



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INTRODUCTION

Kathy, a 12th grade English teacher, projected a web article about bullying at school and asked her students about the process they had undertaken to establish the credibility of the article. What, she asked, had they noticed about the source that helped them decide if this was reliable? “It says .org, which means it’s an organization, which usually means it’s okay,” one student offered. Another student noted some caution. “When we go to the About Us page, there’s no information about the organization.” Kathy continued guiding the discussion, asking several times, “What else did you notice?” Finally, Mary raised her hand and shared that she began evaluating the source by exploring the website on which it was published. She told the class she first looked at the “Members” tab and other links on the website but was dissatisfied with her results. “So, I looked up the organization and I found out that most of the other websites said it was against LGBTQ+ rights and community.” While we live in a world saturated with information, it has become increasingly clear that we cannot rely on the strategies and techniques we used to leverage information through traditional print sources. In the scenario presented above, Mary was the only student to conduct a web search of the publishing organization. Although Mary previously learned to closely examine a text in order to make an evaluation for bias, without trying a different approach and searching another website, Mary would not have uncovered a potential bias.

The rapidly changing nature of our world ensures that “to have been literate yesterday, in a world defined primarily by relatively static book technologies, does not ensure that one is fully literate today” (Leu et al., 2013, p. 1150). Importantly, a “fully literate” reader is able to identify the potential bias of a digital source, especially when the source withholds or hides such bias. This article shares the results of a study in which a teacher, Kathy, used an important source evaluation strategy (lateral reading) in an effort to build the same emerging media literacy skills Mary showed in her response above.

Literacy in the Digital Age

In order to understand how students learn to evaluate online sources, we drew on Leu, Kinzer, Coiro, Castek, and Henry’s (2013) New Literacies to ground our research. This theoretical framework recognizes that readers must “effectively determine, from the internet’s

multiple offerings, a combination of tool(s) and form(s) that best meet their needs” (Leu et al., 2013, p. 1159). At the core of New Literacies is the belief that any emerging digital literacy practice cannot be seen in isolation because the Internet is “this generation’s defining technology for literacy in our global community” (Leu et al., 2013, p. 1158). Therefore, it becomes important to consider how social contexts shape our understandings of new literacies and practices (Perry, 2011). In such a view, our current literacy practices are believed to be significantly influenced by the technologies we access; in turn, we are shaped by those practices (Leu et al., 2013). Because the nature of today’s literacy is deictic, we must consider new literacy practices, including digital source evaluation, in relationship to other web-based new literacies and build “theoretical models around change itself” (Leu et al., 2013, p. 1174).

The guiding principles of New Literacies framed our understanding of online reading and the instructional supports that students draw upon when locating and evaluating information (Coiro & Dobler, 2007). More specifically, we ground our work in New Literacies of online reading comprehension and inquiry (Coiro & Dobler, 2007; Kiili et al., 2019). When students are reading online, they engage in a:

self-directed text construction process in an unrestricted and networked information space that involves several intertwined practices: forming questions, searching for relevant information, evaluating online texts, synthesizing information from multiple online texts as well as communicating what one has learned (Kiili & Leu, 2019, p. 147).

Media Literacy is defined as the ability to access, analyze and produce information for specific outcomes (Aufderheide & Firestone, 1993). Regardless of such outcomes, the “fundamental objective of media literacy is critical autonomy in relationship to all media,” (Aufderheide & Firestone, 1993, p. 1). Such autonomy requires media consumers to engage in critical thinking that empowers them to make informed choices about the media (Kaiser Family Foundation, 2003). In an “empowerment model” of media literacy, consumers are viewed as sharing power with the media through active meaning making rather than ceding authority immediately to the source itself (Aufderheide & Firestone, 1993, p. 18). The researchers believed that informed choices include the ability to make careful consideration of who published the information and what credentials and bias they have in relation to the information being shared.

Because authority (which the researchers understood to be holding expert knowledge) can be viewed as a socially constructed concept, student researchers must consult multiple texts to develop an understanding of the source's context when evaluating its authority. Multiple-text comprehension requires readers to consider how each text relates to the other, a complex cognitive process (Paxton, 2002). While access to multiple texts has potential to support students in a variety of reading tasks, including source evaluation, integration of information across texts does not happen automatically and often requires direct instruction (Stahl et al, 1996). The networked nature of online reading, therefore, offers significant opportunities for students to access multiple texts, but students may not innately understand how to access that network for the purposes of evaluating sources. Reading online requires the reader to navigate multiple, networked texts while making judgements about the credibility of sources.

The digitally connected nature of online information requires readers to engage in purposeful inquiry that is complex and multifaceted. Media literacy allows readers to use that information autonomously and for specific purposes. To achieve such autonomy in a digital environment, students must be able access online reading comprehension skills in order to engage in careful inquiry about the nature of the information.

Lateral reading

American culture is permeated with media messages and images, creating a need for educators to help their students become "critical media consumers" (Kaiser Family Foundation, 2003). Since 1992, the Aspen Institute's National Leadership Conference on Media Literacy has called for developing curriculum and teacher training (Aufderheide & Firestone, 1993) because it remains "vitaly important for educators to facilitate critical attitudes among young media users" (Sekarasih et al., 2018, p. 374). Increasingly, Americans are turning to social media to access news and information about the world. The share of Americans who prefer to get their news online continues to grow, with Facebook the preferred social media platform (Geiger, 2019). However, the Pew Research Center has identified a demographic shift: American teens prefer emerging media platforms such as Instagram, YouTube and Snapchat over Facebook (Anderson & Jiang, 2018). This suggests that educators should focus on media literacy skills that can be adapted to any digital platform.

Asking questions remains at the heart of effective library and information literacy instruction (Levitov, 2016). Student researchers must be taught to ask about source authority so that students can be put in a position "to make their own informed judgements of others' claims of knowledge," (Wilson, 1991, p. 268). Scholars have developed protocols for such questioning. For instance, the participants in this study received previous instruction on the CRAAP test, a heuristic which leads students through evaluation of a website by looking at currency, relevance, authority, accuracy and purpose (Meriam Library - California State University, Chico, 2020).

Evaluating source authority is a difficult task, in part because authority is a socially constructed idea which may require students to ask questions about source credibility (Wilson, 1991). Students may automatically perceive some texts as credible, such as textbooks, without raising questions about audience, purpose, or context (Wineburg, 1991). The digital nature of today's texts makes such evaluation even more complex because the "wide-scale access and multiplicity of sources" that often do not reveal the origin, quality or veracity of information provided (Metzger & Flanagin, 2008, p. 5). Importantly, online information is very different from traditional print sources because "you need no permission to create a website [and the Internet, therefore] has obliterated authority," (Wineburg, 2018, p. 3).

This was apparent in the 2016 Stanford History Education Group (SHEG) study "Civic Online Reasoning," which explored the responses of more than 8,000 students from middle through high school who were given tasks which required evaluation of online information from digital media (including advertisements and sponsored content, photo sharing and news stories) to assess students' ability to think critically about the information presented. In their summary of the study, the authors explained that while "our digital natives may be able to flit between Facebook and Twitter... when it comes to evaluating information that flows through social media channels, they are duped" (Stanford History Education Group, 2016, p. 4). A follow-up 2017 study documented the work of three groups (historians, Stanford University undergraduates and news media fact checkers) and found that while traditional-age students are digital natives and professors are trained researchers, "neither of those qualities... prevents people from falling into misinformation online," (Supiano, 2019). Therefore, where the students and their professors failed to identify

potential bias in online sources, fact checkers succeeded because “they took a very different approach, leaving the site in question to find out what the rest of the internet had to say,” (Supiano, 2019).

Researchers dubbed fact-checkers’ approach to source evaluation “lateral reading” and identified it as a tool to teach strategic thinking while evaluating sources (McGrew et al., 2017). Lateral reading refers to the tabs across the top of the computer screen as the reader opens multiple browser windows to “follow links within the source and do supplemental searches on names, organization or topics” so that the reader may find additional perspectives that help evaluate the original article (University of Texas Libraries, 2020).

METHODOLOGY

There remains little research, however, into how the strategy of lateral reading might be incorporated in a high school classroom. Therefore, the purpose of this study was to explore how one high school classroom teacher taught her students the lateral reading strategy and how related instruction influenced high school students’ ability to critically evaluate online sources. Two research questions guided our inquiry:

1. What strategic thinking do students deploy when evaluating digital sources?
2. How do students implement lateral reading when evaluating digital sources?

Context of the study and participants

While SHEG has recommended the use of lateral reading as a source evaluation strategy, there is little research into application of that strategy in the classroom. To address the question of how students learn to use and implement lateral reading, we conducted a comparative case study. This study follows Merriam’s (1998) characterization of case studies as particularistic, descriptive, and heuristic. The study was particularistic as it focuses specifically on how three students evaluated online sources. It was descriptive as we present the cases in rich and thick descriptions. And it was heuristic as it provides an explanation of students’ source evaluations during a unit in which the teacher taught the lateral reading strategy. The use of a case study allowed the authors to “provide an analysis of the contexts and processes” that could illuminate the demands placed on learners when asked to engage in meaningful lateral reading (Hartley, 2004, p. 323). Each participant was considered an individual case;

researchers then examined data across cases to identify generalizable conclusions.

This study took place in a 12th grade English class at a suburban parochial school with a college preparatory focus. The classroom was considered a bounded system (Merriam, 1998), in that its focus and extent is limited. The school’s student population is overwhelmingly white (about 95 percent), upper middle class and college bound (99 percent of its graduates report college plans). We focused data collection on one class, taught by Kathy Ott, which included 24 students. All participant names are pseudonyms. We focused on three student cases, two males (Andrew and Mark) and one female (Mary). The three students, who were in student work groups, were selected based on a convenience sample. All three students were college bound seniors and earned B’s or above in the course. Andrew and Mike were both athletes who were heavily involved in school clubs and organization, but Mary’s interests were largely as a musician performing with community organizations and bands. While none of the students were enrolled in advanced English language arts courses, the boys were also taking AP Government during the year of this study, and Mary had completed a dual-credit composition course the year before. Therefore, each student came to the study with some advanced training in research and writing.

Instructional unit. As part of the college preparatory English 12th grade curriculum, the class read Malcolm Gladwell’s *David and Goliath: Underdogs, Misfits and the Art of Battling Giants* (2013), a nonfiction book that uses evidence from history, popular culture, and academic research to argue perceived weaknesses can be leveraged as advantages. The text includes many citations and extensive notes explaining references. The course was taught by Kathy, a veteran teacher of eight years who had included Gladwell’s text as part of an English department reform designed to improve the ability of graduating seniors to accurately evaluate and make arguments.

Kathy’s decision to teach the lateral reading strategy grew from her desire to engage students in sophisticated source evaluation so they could better assess the argument Gladwell was making in his book. Kathy wanted her students to “put on a skeptic’s hat,” a phrase she used extensively in her own teaching. On the first day of instruction, Kathy used the concept of the believing and doubting game, which suggests that readers should always look for contradictions and errors in arguments before accepting the argument as true (Elbow, 1973). Kathy commented that she hoped this

activity would prepare students to understand that textual authority should not be automatically assumed, a skill needed to prepare students for lateral reading.

To introduce students to lateral reading, Kathy first modeled the lateral reading moves she wanted her students to make. Using an article about a study on school bullying, she modeled for students the following moves:

- searching the author or organization publishing a source (identified as move 1),
- using a keyword search to independently learn about the source's topic (identified as move 2),
- verifying quotes and information (identified as move 3),
- locating any citations used in the source to compare (identified as move 4),
- Identifying commercial or political purposes through a search of any companies who might advertise or sponsor content on the source's webpages (identified as move 5).

Then, using a stoplight metaphor, Kathy asked students to assign a stoplight color: red = too biased to use; yellow = use with caution; green = use without concern. Following, Kathy introduced an additional article to reinforce students' learning of the lateral reading moves. Using a study that Gladwell references in his book, Kathy's students conducted a keyword search to identify ways that Gladwell may have intentionally construed parts of the study. Throughout the unit, Kathy periodically asked students to use lateral reading moves to evaluate Gladwell's arguments and supporting evidence. Kathy's goal was to provide enough guided practice of lateral reading moves that by the end of the instructional unit students would be able to implement lateral reading moves independently.

At the conclusion of the unit, students worked in groups to develop a statement of judgement about Gladwell's argument. For example, one of the participant's group thesis read, "In *David and Goliath*, Malcolm Gladwell presents his arguments in a very persuasive and convincing manner with his tone and jargon, but loses credibility due to the framing of his sources." After composing a group thesis statement, students worked independently to analyze two supporting sources from Gladwell's book. Students explained the lateral reading moves they used in recorded screencasts. Group members then collaboratively completed a written response to Gladwell's book and defended their judgment using their lateral reading moves.

Data collection

Before the start of instruction, students recorded a screencast as a pretest to establish how they would approach evaluating a digital source on their own. The pretest consisted of a screencast conducted by students prior to instruction about lateral reading. The students were asked to evaluate a blog post from the American College of Pediatricians (2013) titled "Bullying at School: Never Acceptable," which listed the primary author as Den Trumbull. Kathy asked her students to determine whether the provided source would be appropriate to use if they were preparing to write an argumentative essay about school bullying. The source was chosen because it can be identified as an "Astro-Turf organization," or an organization that cloaks its true purposes (Bell, 2018). The American College of Pediatricians is an advocacy group that "characterizes homosexuality as a harmful choice," but the article does not identify this political stance (Spector, 2017). Therefore, students would need to look beyond the source to uncover its potential bias.

We were interested in whether their source evaluation involved strategic thinking or lateral reading moves. During the pretest screencast, students used a screencasting tool (Screencastify) to record a think-aloud that traced both a verbal narration of their thinking and the computer clicks they made in their online viewing. This allowed the participants to share their thinking processes as they evaluated a provided article from a website. Kathy shared the article with the class via her learning management system after the school media specialist gave an introduction to screencasting. Kathy asked her students to determine whether the provided source would be appropriate to use if they were preparing to write an argumentative essay about school bullying. She asked them to use the screen recordings to share how they would answer these three questions about the source: Is this the information I need for my purpose? Is it reliable? Is it biased? The shared article was one SHEG used in their studies and was published by the American College of Pediatricians, an advocacy group of healthcare professionals (Spector, 2017).

At the conclusion of the unit, students recorded a screencast as a posttest. Once again, participants used Screencastify to record a think-aloud that traced both a verbal narration of their thinking and the computer clicks they made in their online viewing while analyzing Gladwell's argument.

The pre- and posttest screencasting videos gave access to two critical think-aloud protocols. Research

has found that think-aloud protocols are an appropriate methodological tool when gaining insight into a participants' cognitive process (Charters, 2003; Coiro & Dobler, 2007; Karchmer-Klein & Shinas, 2019). Spires and Estes (2002) suggested that think-alouds are effective "to help uncover potential cognitive processes inherent in Web-based reading environments" (p. 123). In the lateral reading study, the think-alouds specifically offered insight into the thinking processes students brought to their source evaluation task (Charters, 2003; Coiro & Dobler, 2007; Karchmer-Klein & Shinas, 2019).

Data analysis

The authors analyzed the pretest and posttest think-aloud data inductively and deductively. First, the researchers completed an independent coding of transcripts of each screencast, remaining open to new insights through an inductive process (Maxwell, 2013). After initially coding results, the researchers met to discuss the findings. The researchers then collaborated to refine each code and worked together to identify appropriate coding categories. In this step, the researchers looked for evidence of skeptical stances and lateral reading moves. The data provided evidence of students using strategic thinking while evaluating digital sources. The data also provided evidence of the lateral reading moves students implemented when evaluating digital texts.

RESULTS

In the following section, we will report the results of both the pre and posttests.

Pretest results

The skeptical stances recorded in these pretest screencast videos indicate that the students did, in fact, consider their purpose in the evaluation task and, therefore, demonstrated some strategic thinking.

For example, Andrew conducted a careful study of the digital source by describing the features of the article and reviewing what other articles were posted on the ACP website. Mark found an article by the Southern Poverty Law Center declaring ACP a hate group, but that was only after he spent the majority of his time (about 1:30 out of 1:58 minutes) reviewing the article and noting characteristics such as the topics and references in the article. The only exception was Mary, who began her screencast by stating, "The first thing I am going to do is look at the organization, because I feel that this is probably the most important." Her first skeptical utterance – "Wait, alright, I don't like the look of this" – came after she conducted a Google search of ACP. A summary of the students' reading moves and skeptical stances can be found in the table below.

Table 1. *Pretest results*

	Length of screencast	# of instances of skeptical stances	Lateral reading moves (frequency)
Andrew	1:45	1	0
Mark	1:58	2	Move #1 (1)
Mary	12:24	6	Move #2 (2) Move #1 (2)

For two of the three students, their skeptical stances were shaped by their own understanding of the issues under consideration in the article. Andrew declared that he found the source biased because "it says parents should be the primary focus for both the prevention and correction of bullying. I feel like that is a little biased towards parents." Early in her screencast, Mary questioned the acronym used in the ACP website (LGBT) declaring that it should include a "Q" and then

sharing, "I don't like what I found about the LGBTQ stuff."

Without instruction, Mary did use lateral reading in strategic ways during the pretest, taking at least four lateral moves. Additionally, Mary was also the only participant to make a multistep lateral reading move in the screencast. In this case, her lateral reading moves took her to the ACP position statement "Gender Identity Issues in Children and Adolescents," in which she reads the word "innate." Indicating she was unsure what

innate means in this context, Mary opened another webpage in a second tab to search for the definition of “innate” and then used what she learned to comprehend the first source. She muttered, “So they are trying to say that – oh boy – so they are trying to say that treating gender dysphoria is based on the assumption that gender dysphoria is a valid problem of sorts.” She went on to reason that this could be one reason the group is identified as being anti-LGBTQ.

Finally, all the students did use close reading of the original source to develop their skeptical stances. Mary, for instance, spent about a minute scrutinizing the “Become a Member” tab, reading directly from the webpage where it asks, “Have you felt a sense of frustration lately that your current medical associations are investigating social agendas that are not reflecting your personal values and convictions?” Using utterances such as “Whoa... what is this?,” she then declared this a “red flag.” Mark noted the same tab but spent only about 10 seconds on it, noting that the mention of dues makes him “question how strong this organization is.”

Additionally, he was skeptical that a professional organization would have something as informal as a blog on its webpage.

Posttest results

Students returned to screencasting their evaluation of sources for the posttest, which was conducted in the final week of the six-week unit and after the class received instruction about lateral reading and completed multiple lateral reading tasks during their study of Gladwell’s *David and Goliath: Underdogs, Misfits and the Art of Battling Giants* (2013). The posttest required students to back up their judgement of Gladwell’s argument by laterally reading at least two sources of evidence he used in constructing his argument. The length of screencast, instances of skeptical stances and use of lateral reading moves was recorded so that these could be compared to performances on the pretest and to trace changes in students’ use of lateral reading in support of their strategic thinking.

Table 2. *Posttest results*

	Length of screencast	# of instances of skeptical stances	Lateral reading moves (frequency)
Andrew	7:35	6	Move #1 (6)
Mark	4:12	6	Move #1 (2)
Mary	11:20	11	Move #1 (8)

In their posttest screencasts, two of the three students spent significantly more time investigating Gladwell’s argument than they did when they were investigating the American College of Pediatricians’ (2013) article. Andrew’s total time spent evaluating his sources increased threefold, while Mark’s doubled. The third participant, Mary, created a screencast of similar length to her pretest. The increase in time corresponded with participants incorporating more lateral reading moves when analyzing Gladwell’s argument. Andrew, who had not incorporated any lateral reading moves in his pretest, included six moves; Mark used two (an increase from the single move he made in the pretest) and Mary, who had used four lateral reading moves in the pretest, doubled her instances of lateral reading in the posttest. While the number of lateral reading moves increased, all three students relied only on the first move, searching

the author or organization publishing a source (identified as move #1).

All three participants evaluated Gladwell’s claims by analyzing the sources that he used to support them. The students’ lateral reading moves were used to determine if Gladwell provided appropriate information and examples in his argument. Their analysis of his use of sources influenced their perception of his credibility. For example, Mark started his screencast by stating, “Our group’s thesis was that in *David and Goliath* Malcolm Gladwell presents his arguments in a very persuasive and convincing manner with his tone and jargon but loses credibility due to the framing of his sources.” He went on to report that “an example of this comes in Chapter 3 when Gladwell is telling the story of Caroline Sacks and relative deprivation.” Mark went on to explain that Gladwell shared how Caroline Sacks’ success as a high school student may have been a

weakness when she entered a highly selective college and was no longer a top student among her peers. In his text, Gladwell uses the concept of relative deprivation, a sociological claim that people measure themselves against the people around them that was coined by Samuel Stouffer during World War II. In his lateral reading, Mark found an article from the American Sociological Association about Samuel Stouffer and relative deprivation. Using his cursor to highlight phrases from the article, Mark found information about when Samuel Stouffer was a writer and said, “This seems a little out of date compared to when Caroline Sacks was attending school. So, this source may be outdated.” He continued to read the article from the ASA and commented, “They say that they largely abandoned this concept because it ‘failed to meet the overstated claims.’” Mark went on to refute Gladwell’s use of relative deprivation because Gladwell “quoted a study that is no longer accepted by the American Sociological Association.”

Similarly, Mary used additional sources to find out more about the examples Gladwell cited to support his argument. In the book, Gladwell argues that lowering class sizes, often seen as an improvement initiative, does not take into account the advantages of larger classes. As part of this argument, Gladwell cites Student Teacher Achievement Ratio (STAR), a four-year study of class sizes commissioned by the Tennessee General Assembly. To evaluate Gladwell’s use of this study, Mary wanted to learn more about the STAR project. After using an article about class size and student achievement from the Eric database, Mary noted, “I am going to look up the results because I already know what the study is, but I want to know more about the results.” She became skeptical of Gladwell’s argument, though, when she found a source that explained there were small advantages found to smaller class sizes when looking at achievement scores in reading and mathematics. Mary noted, “So right there, that’s a red flag.” A minute later, after continued reading, she declares, “So, he kinda twisted the information so that it supports his argument.” During this time, Mary very sarcastically stated, “This study took place in the 1980’s, so that’s also great,” seemingly indicating that the date influenced her perception of the results of the study.

Furthermore, all three students increased the skeptical stances they took when evaluating Gladwell’s argument. Similar to the analysis of the pretest, their skeptical stance was typically indicated by their word choice. For example, the students used words and phrases such as “cherry-picked,” “red flag,” “uses

sources ineffectively,” and “twists information to support his argument.” For example, Andrew examined Gladwell’s claim that power has limits. In this part of the book, Gladwell shares the story of André Trocmé, a French pastor who convinced most of the residents of his remote village to save Jewish refugees fleeing the Nazis. Gladwell argues that Trocmé showed how someone who is perceived as weak could defy a regime as strong as the Nazis during World War II. Andrew found a source that explained that Trocmé’s village was never under the direct control of the Nazis, but rather was ruled by the French Vichy under Nazi direction. Additionally, the new source shared that the French Resistance grew in power during Trocmé’s 10 years of defiance, and the Nazi government largely ignored Trocmé’s deeds until it found the larger political movement too dangerous to ignore. Andrew declared, “This confirms that Gladwell cherry-picked his sources to fit that claim because if you laterally read his sources, he (Gladwell) leaves out a lot about what actually happened with André Trocmé.” There were numerous instances such as this in which the participants used information discovered during laterally reading to take a skeptical stance in evaluating Gladwell’s argument.

Discussion

It seems that simply asking students to evaluate a source may, in fact, create a sense of purpose to guide students to some level of strategic thinking. In this study, all three students came to the initial pretest task with some skepticism, but for two of the three students that skepticism seemed limited to their own experiences. For example, participants’ initial skepticism seemed to largely come from their own impressions of the topic (such as when Mary discussed wariness about language the source was using about LGBTQ students and Andrew talked about the unfairness of blaming parents for problems of bullying), or their assumptions about professional organizations (such as when both Mark and Mary noted the membership tab in their ACP website). In addition, participants spent most of their time making observations about the source itself. In prior instruction, participants had been taught to use the CRAAP test, a heuristic for source evaluation that requires students to consider a source’s currency, relevance, authority, accuracy, and purpose (Meriam Library - California State University, Chico, 2020). This might explain why Mary, Andrew and Mark spent most of their time looking at the American Pediatrician’s College website rather than engaging in research from other sources.

After instruction, all three participants used their initial reading of Gladwell's work to identify possible lateral reading moves, demonstrating that they were engaged in multiple-text comprehension. This was a complex cognitive process in that students had to consider how the results of their lateral reading moves relate to Gladwell's initial argument. Because research indicates that making connections between multiple texts does not happen automatically (Stahl, et al, 1996), it would appear that the direct instruction of lateral reading created a scaffold which prepared students for multiple-text comprehension. Importantly, the direct instruction seemed to prepare students to engage in a self-directed inquiry that required participants to engage in several "intertwined practices: forming questions, searching for relevant information, evaluating online texts, synthesizing information from multiple online texts" (Kiili & Leu, 2019, p. 147).

In the posttest, all three participants relied exclusively on one lateral reading move (identified as move #1), as they repeatedly researched the organizations and sources Gladwell used in his argument. Establishing a source's credibility requires students to make informed judgments about others' claims of knowledge (Wilson, 1991), but students repeatedly sought only one strategy to find such information. It is clear that the networked nature of web research provides students with seemingly unlimited access to information, but students may not always be able to determine what "combination of tool(s) and form(s) [...] best meet their needs" (Leu et al., 2013, p. 1159) when engaging in lateral reading.

CONCLUSIONS

It was unsurprising that students engaged in more lateral reading after being given direct instruction. However, we felt that there were important implications in our observations of the student screencasts that can guide future work on information literacy in the digital age generally and lateral reading strategies specifically. Our observation of Mary in particular led us to wonder about the importance of personal beliefs in the skepticism that students approach texts with. Janks (2019) notes,

It is really hard to engage with text that offends us and really easy to read with a text that supports our view of the world. Conversely, it is hard to undertake a critical reading of texts that confirm our views and easy to be critical when we read texts that we disagree with (p. 561).

The goal of the lateral reading strategy was to help students take a critical reading of a text, whether or not they agree or disagree. The results of the students' second screencasts indicate that incorporating the lateral reading strategy encouraged them to slow down their reading of the text as they were noticing specific authorial choices used in the text to build an argument. It was through this slowing down and noticing that students became more skeptical about what they were reading. For example, in Mary's initial screencast analyzing the article "Gender Identity Issues in Children and Adolescents," she shares, "I don't like what I found about the LGBTQ stuff." Although she notes that the organization is "professional" and "seems legit," her personal beliefs seem to consistently be the impetus for her critical evaluation of the site. We wonder if she would have been as critical in her analysis if she would have agreed with the information found on the website. Her first screencast seems to take a critical stance mainly because of her objection to (or political leanings against) the material posted on the website. In the second screencast, Mary doesn't indicate any political, social, or personal affiliation to the argument Gladwell is making, and yet she has more instances of taking a skeptical stance, each time slowing down her reading to participate in one of the lateral reading moves. We don't want students' critical reading to only be fueled by their own personal beliefs; rather, it should be developed by taking critical noticing of how texts position readers so that they can consistently evaluate all texts with a critical lens.

While SHEG discussed the ability of digital natives to "flit between Facebook and Twitter," (Stanford History Education Group, 2016) we found indications that the participants lacked sophisticated web-searching strategies. For instance, students seemed unable to distinguish between when their results brought up entire sources or just the abstract, and there was no effort to find information that was initially behind a paywall. While they did conduct keyword searches, they never used BOOLEAN search terms or any advanced searching techniques. Importantly, the students tended to use the first few results from their search, and none of their think-alouds indicated any strategic thinking about which search result to consult after making the lateral reading moves. We found only one example of a multistep lateral reading move in which Mary looked up a term used in the source she found after her initial lateral reading move. Students made no effort to vet the results of their lateral reading and instead accepted as valid the results they got. While lateral reading did seem

to enhance students' skeptical stances, their doubts were reserved for Gladwell.

It may be that engaging in multistep lateral reading will take practice, in part because of the demanding reading that digital sourcing requires. Internet reading is complicated by the "complex and integrated reading comprehension process" as learners search and locate information online, (Coiro & Dobler, 2007, p. 239). Lateral reading may prove to be difficult for learners because schools generally have taught them to accept textual authority, and "technology integration is closely aligned with existing classroom practices" (Tolmie, 2001). Understanding search behaviors is important to helping students identify coping strategies when their web searching strategies fail, and educators should actively help learners adapt their searches (Mansourian, 2008). Importantly, teachers must remember that the web was not designed for learners or school settings. Searching for information often "leads to insufficient knowledge, understanding and insight" for the student (Kuiper et al., 2008, p. 667), and without training, students will gravitate to finding the information as quickly as possible (Fargo, 2017). Therefore, teachers must anticipate learner needs and develop appropriate supports to guide students' work when introducing lateral reading. Direct instruction and modeling should prepare students to consider readjustments when initial strategies fail to gain the desired results. Importantly, questioning of source authority should happen routinely in the classroom, not just during lateral reading instruction.

Finally, teachers need to resist the urge to dismiss outdated source evaluation strategies all together. Close examination of the initial source caused each of the participants to question some aspects of the source, such as when Mary and Mark spent time investigating the "About Us" tab to find out more about the publishing organization. While this did not position students to discover the political leanings of the American Pediatrician's College, it offered students a way-in to the critical mindset needed for the task. Research suggests that students with advanced, constructivist-oriented epistemological beliefs showed more evidence of purposeful thinking skills when engaging in web-based searches (Tu et al., 2008).

Therefore, placing the lateral reading strategies in relation to what the learner already knows about source evaluation tools could allow learners to develop the skills and habits of mind necessary for successful lateral reading.

Limitations

It is important to recognize the limitations of this study. First, the study was conducted with a small convenience sample of students in a 12th grade English class who were considered above average students with significant experiences in research and writing. Therefore, it is possible our results might reflect higher research skills than would be found in a more diverse sample. Second, data included the pre and posttest think-aloud protocols. While research has identified that think-aloud protocols are effective methodological tools, particularly when examining cognitive processes in web-based reading environments, we note that additional data and triangulation may have strengthened the findings (Charters, 2003; Coiro & Dobler, 2007; Karchmer-Klein & Shinas, 2019; Spires & Estes, 2002).

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