

## Click Restraint: Teaching Students to Analyze Search Results

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**Abstract:** Young people often rely on search engines to find news or answer questions, yet research suggests that they need more support to learn to effectively navigate search results. We present findings from an intervention study in which one lesson focused on teaching students to evaluate search results and select websites to open. Findings suggest that, although teachers attempted to teach strategies for evaluating results modeled on fact checkers' approaches, students often fell back on less robust strategies: they used their familiarity with a website and a website's top-level domain to judge its trustworthiness. Our findings suggest avenues for further supporting young people to build effective strategies for navigating search results.

### Introduction and framing

When young people need information or are looking for news, they are likely to turn to search engines. Research suggests that young people often click on the first or second result on a search engine results page (SERP) and express belief that those results are the most reliable (Gwizdka & Bilal, 2017; Hargittai et al., 2010). In reality, SERPs are the products of proprietary search algorithms that can be gamed by savvy website owners (Ledford, 2015) and may produce politically segregated search results (Flaxman et al., 2016). While there is still much to learn about the overall effect such algorithmic biases have on one's flow of online information (e.g., Dubois & Blank, 2018), teachers could play a critical role in helping students understand the consequences of navigating algorithmic spaces uncritically (Noble, 2018) and to navigate SERPs effectively to find quality information.

What does effective navigation look like? Rather than clicking on the first result, skilled information seekers spent time on the SERP and engaged in *click restraint*: They carefully read titles, URLs, and snippets and used their background knowledge to make decisions about which sites to click and which to avoid (Wineburg & McGrew, 2019). As they scanned search results, fact checkers asked themselves whether websites were familiar and if they met their information needs, deeming them promising or suspect depending on the task at hand. In one search scenario, fact checkers investigated who provided funding for plaintiffs in a court case by scanning most of the SERP and prioritizing articles from news sources. As one fact checker explained, "I'm coming up with a lot of different information. I'd rather click on some press reports" (Wineburg & McGrew, 2019, p. 28). A clear picture of their information needs, combined with knowledge of potential sources that might best meet those needs, informed fact checkers' choices about where to click.

Existing research suggests that educational interventions can help students learn to spend more time reading the SERP and analyzing the strengths and weaknesses of their searches (Bakke, 2020; Salmerón et al., 2020). However, more research is needed on how to support students to select sites to open from the SERP, as well as on what students learn from this instruction. Researchers have included navigating search results in efforts to teach students to find and evaluate online information but have not offered details about what these sessions focused on—or what, specifically, students learned (e.g., Ibieta et al., 2019; Terrazas-Arellanes et al., 2019). We began an investigation into the question of how we might teach click restraint as a strategy for navigating search results. We asked, In classes dedicated to analyzing search results, how do students and teachers reason about elements of the SERP? On what do they base decisions about where to click?

### Method

Data were drawn from a larger study conducted by the Stanford History Education Group to investigate the efficacy of a curricular intervention to teach high school students to evaluate online information (see Wineburg et al., 2019). The study took place in a large school district in the Midwestern United States. As part of this study, six 12<sup>th</sup>-grade government teachers at three district high schools taught six lessons in *civic online reasoning* over the course of 10 weeks. *Civic online reasoning* is conceptualized as the ability to effectively search for and evaluate online information and centers on asking three questions of digital content: Who is behind this information? What is the evidence for the claim? What do other sources say? The lessons were developed and piloted by the Stanford History Education Group. Evidence from pilot studies and from pre- and posttest data collected in this intervention suggested that the lessons were effective in improving students' civic online reasoning (McGrew, 2020; Wineburg et al., 2019). Before participating teachers taught the lessons, they participated in a day-long professional development workshop led by two members of the research team. Teachers

were introduced to civic online reasoning, participated in modeled portions of the lessons, and collaborated with colleagues and the research team to review and modify the lessons.

## Teaching click restraint

The final lesson in the six-lesson sequence was devoted to teaching click restraint. This lesson began with teachers asking students where they usually click first within search results. Teachers then delivered a short (5-8 minute) lecture on the factors that influence the order in which search algorithms display results. Although search engines claim to factor both relevance and quality into the ordering of websites in the SERP, teachers emphasized that students bore the responsibility for evaluating how well sites actually met these standards—and which sites to ultimately click on. Next, classes practiced analyzing a sample SERP together. Teachers led students in evaluating the results one at a time, discussing the details they could glean from each result in relation to their information needs. Finally, students practiced analyzing another SERP on their own. They worked from a custom search engine that returned the same results to each student, aided by a graphic organizer that prompted them to examine aspects of the SERP before making a decision about where to click.

## Participants and data

This study focused on the classes of six teachers who taught the six civic online reasoning lessons. Participating teachers video recorded the civic online reasoning lessons in one of their class periods. Pursuant to the district's guidelines for videotaping classes, teachers positioned the video camera so that it recorded them teaching but did not capture students' faces. Video and accompanying audio recordings thus captured students' and teachers' comments during full-class instruction portions of each lesson but not during group or individual work time. Teachers also shared student work from the class period they recorded if the student had assented, and parents or guardians had consented, to participate in the study. Across the six teachers' classes, there were 54 completed graphic organizers from the click restraint lesson available for analysis.

## Analysis

Portions of the click restraint lesson that included full class instruction and discussion were transcribed. The authors read these transcripts multiple times to identify themes in the ways students and teachers reasoned about elements of the SERP. Because instructional practices that support students to evaluate search results have not previously been theorized in depth, we used inductive coding and constant-comparative analysis (Strauss & Corbin, 2015). We constructed analytic memos to track themes and key episodes that emerged regarding how teachers and students reasoned about the SERP and which sites to open or avoid. We then read and analyzed students' graphic organizers, adding to and amending the memos based on evidence of student thinking available in their responses. Based on this exploratory analytic work, we identified two themes that surfaced across the lesson videos and graphic organizers, which we detail in the findings.

## Findings

Two themes emerged from our analyses of dialogue and student work from the click restraint lesson. First, teachers regularly advised students to avoid clicking on sites they did not recognize. All six teachers differentiated between sites they “knew” and sites they didn't as they discussed search results. For example, a teacher had the following exchange with students as they examined a SERP for a search on Internet filtering policies in schools:

- Teacher: So the top result is “Why schools block websites and you should too” from Net Nanny.
- Okay. Does anybody know Net Nanny is a website? Are you familiar with this one?
- Student 1: No.
- Teacher: Never heard of it. Me, I've never heard of it. Ooh, but number two is ALA.org. The American Association of School Libraries. Might they be a quality source?
- Student 2: Sure.
- Teacher: Okay. Which one would perhaps be least reliable for information?

In this exchange, the teacher moved beyond the result displayed first, Net Nanny, after confirming that he had “never heard of it,” implying that being unfamiliar with a website justified passing over it. His reaction to the American Association of School Libraries website, which the teacher did seem to recognize, was more

positive: After seeking confirmation from a student that it might be a “quality source,” the teacher shifted the line of questioning from deciding which sites to open to finding the least reliable site. Over the course of the lesson, teachers expressed recognition of—and comfort with—sites including the *New York Times* and *Business Insider*. Meanwhile, teachers said they were not familiar with and therefore would not click on sites like Final Edition, Empire News, and Net Nanny. In these cases, the strategy of avoiding the unfamiliar functioned efficiently: the *New York Times* and *Business Insider* are likely better sources of information than parody or satirical websites (Final Edition and Empire News) or a company that sells internet filtering software (Net Nanny). The reasoning that teachers modeled in these instances mirrored fact checkers’ approaches to search results and was, in fact, what the lesson plan advised.

Evidence from the lesson calls into question whether this reasoning was equally effective for students. Students likely have more limited and less differentiated knowledge of “known” websites than their teachers. Thus, they may not be able to distinguish between sites like Net Nanny and the American Association of School Librarians based on background knowledge alone. Further, some students selected or rejected websites based on their familiarity with the sites. When students worked independently to evaluate sources from a SERP on school uniform policies, aided by the graphic organizer, they offered explanations for why sites may or may not be trustworthy that relied heavily on their familiarity with the site (see Table 1).

Table 1: Examples of students’ reasons for trusting (or not trusting) websites based on familiarity.

	Reasons Provided to Distrust a Website	Reasons Provided to Trust a Website
Examples of Student Responses in Graphic Organizer	<p>“I know nothing about LiveAbout though so maybe not the most trustworthy.”</p> <p>“I don’t think this is a good source because I haven’t heard of the source before.” (Frenchtoast.com)</p> <p>“From a not known source.” (Vogue)</p>	<p>“I think this source is probably going to be one of the best sources. It is one that many people know of.” (USA Today)</p> <p>“It is from a well-known source (Vogue).”</p> <p>“Because they are from sources I know.” (USA Today)</p>

Students embraced sites they were familiar with and rejected those they did not recognize. “I haven’t heard of the source” became a reason to distrust—not just temporarily pass over—a website, while “sources I know” were trusted. Students appeared to skip the stage of using what they knew about a site to decide if it met their information needs. Instead, student responses suggested that they equated familiarity and trustworthiness.

The second theme to emerge was that students showed evidence of judging sites on the SERP based on their top-level domains. When teachers asked what details available on the results page they might use to decide where to click, students in each class mentioned the top-level domain. Teachers often problematized the assumptions that were implied in these exchanges; for example:

Student 1: The dot com.  
Teacher: But did we say dot coms or dot orgs really matter anymore on reliability?

A few talk turns later, after the teacher asked what kind of site students hoped to find in the search results, another student offered:

Student 2: Like a dot org.  
Teacher: Okay, could be. But again, does a dot org always—is it infallible? Could it actually be untrustworthy? In this day and age? At one time dot coms were “Ooh, they’re bad; dot orgs are good.” But in this time period of now, present day, does it really matter?

Evidence of reasoning about the top-level domain also appeared frequently in students’ graphic organizers, generated while students worked independently or in groups. For example, students wrote “The site is only a .com and the title is ‘French Toast’ which has no credibility tied to it” and “Yes because the first one is a .org.” In these cases, students substituted one weak heuristic—assuming the top search result is the most reliable—for another, drawing conclusions based on a top-level domain.

## Discussion and conclusion

Teachers advised students to practice *click restraint* in order to avoid the problematic heuristic of quickly clicking on the top result. However, evidence of students’ reasoning in the lesson suggests that students substituted other,

possibly equally problematic heuristics: They embraced sites they recognized, avoided sites they didn't, and used the top-level domain to make choices about where to click.

This study suggests that students need more practice slowing down on SERPs to consider whether websites, even those with which they are familiar, meet their information needs. To do this without falling back on fallible heuristics like judging websites by their top-level domains, students likely need to build their knowledge of websites and the information they are likely to offer. Instead of advising click restraint from the beginning, teachers might encourage students to click on more sites, even those they do not recognize, to learn more about the sites and the information they provide. Students might curate a catalogue of websites they investigate through such clicking to collaboratively build knowledge of websites. Further, teachers might encourage students to work together so they can discuss SERPs and benefit from each other's knowledge.

These findings lay the groundwork for continued research on how to support students to develop click restraint. Evidence from this lesson suggests that students need continued practice analyzing search results; teachers may thus need help planning for ways to integrate lessons in which students practice click restraint across the curricula. In particular, future studies should probe how teachers can support students to build the knowledge about sources that helped fact checkers effectively use click restraint (Wineburg & McGrew, 2019). Such studies might examine the efficacy of the strategies suggested above: supporting collaborative inquiry so students share knowledge as they examine search results and encouraging students to click and learn about websites in SERPs. Search engines and SERPs are a frequent presence in students' lives, and this study contributes to a growing body of literature on how schools and teachers might better support students to navigate and evaluate these resources.

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