Networked Reading: How Digital Reading Experts Use Their Tools

Of late, scholars have grappled with how best to promote reading comprehension in the face of technological change. Typical approaches draw parallels between print and digital literacies, seeking to use disciplinary knowledge about the former to shape the latter. This essay seeks to foreground the unique affordances of digital reading technology. Drawing on recent empirical research, it argues that successful digital readers are networked readers, in that they use digital affordances—particularly information access—to better understand complex or unfamiliar digital documents. This insight indicates that the promotion of digitally specific heuristics, such as lateral reading, along with research-intensive pedagogies, can be a productive means to promote digital reading comprehension.

A Changed Landscape

There is little doubt that reading practices have undergone significant change in recent years. Text is now digital, the printed page a screen. In sum, what we might call the "material substrate" of reading has been transformed. Teacher-scholars have begun to engage this new digital reality. After a decades-long lull, the "question of reading," as Mariolina Rizzi Salvatori and Patricia Donahue put it, is now "being asked with renewed vigor and passion" (6). As such, in recent years, we can find articles that discuss digital reading in relation to genre (Morris; Rodrigue "Genre"), meaning-making (Carillo "Navigating"), and "slow reading" (Miller). On a parallel track, scholars have sought to connect reading, writing and networked literacies (Miller & Leon; Craig; Overstreet). Taken together, this work evidences a growing consensus that digital reading practices need to be studied and shaped, and that the college English classroom is an appropriate place to do so. It also evidences an emerging pedagogical consensus. Digital reading, within this emerging paradigm, entails engagement with both textual and non-textual modes. It entails reading and understanding, of course, but also the ability to locate and evaluate documents in light of broader discourses and personal needs. On the whole, reading skills are viewed as at least semi-transferrable (Carillo "Creating"). By encouraging reflection, experimentation, and situational awareness the new consensus holds that reading/writing teachers can help students engage productively with texts in a variety of situations. Thus, reading instruction can inform not just academic life, but also personal and public life. It can help students read and understand all aspects of our "cacophonous democracy," as Ellen Carillo puts it ("Navigating" 154).

Overall, I believe that this new wave of reading scholarship is of great value. For many, reading on the screen represents one of the primary conduits through which we understand the world. Educators would be remiss not to attend to it. Likewise, the idea that we should help students attend to context, their own reading practices, and the fit between the two, is both simple and powerful. I do worry, though, that the emerging paradigm, as of yet, has not sufficiently engaged the unique affordances of the digital. As Richard Miller writes, "every aspect of the reader-writer relationship has been transformed by the shift from paper to screen" (158). In a digital, networked, screen-centric world, he claims, information is ubiquitous, connection instantaneous. This fundamentally alters what it means to read. As I see it, the recent wave of digital reading scholarship has not fully acknowledged the magnitude of these changes. Simply put, new tools open up new possibilities. In pursuing what Jacob Craig calls a "strategy of immediacy"—one that emphasizes similarities between print and digital—the emerging digital reading paradigm, while of on the right track, has yet to recognize the extent of these possibilities.

To better understand how to read on the screen, I suggest we consider the literacy behaviors of highly skilled users of digital technology. Fortunately, recent empirical scholarship, particularly in the area of information literacy, provides insight. Attention to this scholarship, I will argue, reveals that digital information experts are *networked readers*. They intuitively recognize that no text exists in isolation, and thus, the best way to understand a text is often to look beyond it. Such readers use digitally specific heuristics—such as lateral reading—to tap digitally specific affordances—such as instantaneous connection and information access. They are willing and able to exploit a wide range of resources to supplement the conceptual maps, or schemas, by which they understand target texts, and are particularly skilled at using different sources, modes and genres to supplement each other. All told, we can say that in their attitudes and behaviors, the best digital readers—networked readers—fully embrace the networked logic of digital space: they display a networked mindset. Insight into their reading practices can, and I will argue, should, fundamentally change how we teach reading.

The Current Paradigm

English studies' new wave of reading scholarship works from a shared set of assumptions. First, scholars agree that the ability of American college students to read and understand complex digital documents is lacking. Students often have difficulty finding and evaluating online information sources (Carillo "Navigating"; Jamieson; McGrew, et. al). They also have difficulty incorporating information from digital sources into their own writing (Rodrigue "Sources"). This lack of digital reading proficiency can have broad impact. In 2011 Alice Horning noted the extent to which "extended informational prose text on paper" plays a key role in learning across the university ("Manicules" 2). I'd argue that ten years later, this statement is still true. But only partially. Whether an academic journal article, an exposé from the *New York Times* or Tesla's quarterly report, "extended informational prose" is still an essential teaching and learning tool. Such prose is no longer primarily encountered on paper, though. It is now encountered on screens, often combined with a variety of non-textual modes and embedded in complex digital ecologies. Of course, today's "digital natives" are familiar with digital devices. Likewise, many (if not most) are capable operators in a range of digital spaces. Evidence indicates, though, that too many college students have difficulty reading, understanding and learning from digital information resources.[1] This is the exigency to which the new wave of digital reading scholarship—and indeed this essay—seeks to respond.

Reading scholars often explain students' poor digital reading performance by referencing the unique nature of the digital reading environment. Tanya Rodrigue, for example, cites her own classroom experience in claiming that students "can't read" on digital devices and as of 2017, still prefer print texts. Rodrigue claims that "mediums and genres invite particular kinds of reading" and that digital devices and emergent digital genres invite quick, shallow forms of engagement which "repeal long term memory and comprehension" ("Genre" 239). Students recognize this and thus use paper when they can. Rodrigue largely echoes Richard Miller, who claims that speed, distraction and the urge to multitask are the defining features of digital reading. Both scholars position these digital reading practices opposite "deep reading," or sustained attention to a single text, behavior presumably necessary for comprehension.

Ellen Carillo also believes that "digital culture" impedes comprehension. She argues that digital devices and omnipresent connection promote "a passive model of reading," in which readers are positioned as "downloaders" of meaning, rather than active meaning makers ("Navigating" 141). Citing philosopher Michael Lynch, Carillo draws a distinction between "knowing" and "understanding." The former involves ready access to decontextualized facts, often of a superficial sort. The latter involves "grasping relationships," connecting parts to make wholes (142). Both Lynch and Carillo believe that digital environments, marked by acceleration, information excess and decontextualization, promote knowing at the expense of understanding. The result, they believe, is a decrease in intellectual agency.

After diagnosing the deficiencies of common practice, Miller, Rodrigue and Carillo each offer updated reading pedagogy as a corrective measure. While all privilege reflection and contextual awareness, how they aim to achieve this end varies. Miller, for his part, advocates instruction in "slow reading," the goal of which is to help students escape cultural acceleration and open "a mental space for deliberation, speculation, reflection, meditation" (155). By making time for "the embodied *experience* of learning," he claims, students can begin to understand, as opposed to merely know (155). Rodrigue believes that genre awareness is key. She argues that digital reading best be understood as an act of design, in that it involves combining various modes to make meaning. By teaching students to see themselves as designer, and drawing attention to the formal features of texts and how those features shape the reading process, she believes we can help students read more deliberately, resulting in increased comprehension. Carillo also suggests increased attention to the act of reading. She believes that we need to make clear to students that meaning is never "in the text," but instead results from an active process of negotiation. This process inevitably implicates the reader's needs, experiences and inclinations, factors which should be actively foregrounded (see "Creating Mindful Readers"). Such positioning, Carillo believes, counteracts the dominant digital paradigm of reading-as-downloading. It helps students read more critically, giving them license "to question, challenge, and maybe even seek to disprove" information sources ("Navigating" 145).

Taken together, the above scholarship presents a set of useful tools for teaching reading in a digital age. Personally, I believe that every undergraduate should take a course in "slow reading" such as Miller describes. Likewise, Rodrigue's concept of reader as designer and Carillo's mindful reading framework should be classroom staples. That said, it appears to me that so far this new wave of reading scholarship has yet to seriously engage the unique affordances of digital space. Indeed, all of the above scholarship remains firmly rooted in print-reading practices. Rodrigue, for instance, quoting Troy Hicks, makes clear that whether reading on the page or screen, the act "still remains a process of creating meaning from words and images" (242). In turn, her suggestions for digital reading pedagogy draw mainly on genre theory—theory originally developed with reference to printed texts. Along similar lines, Carillo's recommendations for how to promote mindful digital reading center on annotation skills and modeling, forms of instruction drawn from her own extensive scholarship on print-reading practices. Other recent reading scholarship is more explicit in its commitments, challenging the need for digitally native reading pedagogy of any sort. Janine Morris, for instance, argues that because reading practices are always "situational and goal based," scholars should avoid drawing a firm line between print and digital (129). To make too much of the distinction among tools, she believes, "ignores the incredible overlap between the reading strategies we use to read both print and digital texts" (126; see also Horning "Not New").

Now, of course, reading practices are (or should be) "situational and goal based," and reading strategies do overlap to an extent. That said, reading well with books and printed pages does not necessarily equate to reading well on screens and within networks. Recent empirical research from the Stanford History Education Group (SHEG) illustrates this point. As I will discuss in detail below, SHEG researchers monitored undergraduate students, PhD-level historians, and professional fact-checkers as they read online information about social and political topics (Wineburg & McGrew). The primary goal was to measure facility at evaluating online information sources. As Carillo, Craig and others in our field have noted, the students performed abysmally, proving themselves easily manipulated by superficial design elements. Notably, though, the historians also performed poorly. Trained to engage in "deep reading," and look for primary sources and proper citation practices, these professional readers of the printed page found

themselves exhausted, overwhelmed, and ultimately deceived by digital manipulation practices. "Each of these historians was an astute reader," the study's authors write, "but reading skills alone weren't enough to pull back the curtain from a cloaked website" (28).

I want to suggest that SHEG's findings should be of concern to composition scholars, literature scholars and others who wish to teach digital reading. First, they remind us that, though, like historians, we are experts in reading, our expertise might not translate smoothly to the digital realm. In fact, certain disciplinary practices—like the historian's tendency to seek out primary sources—might be a hinderance in this new space. Relatedly, the findings hint at the pitfalls of attempting to "translate" disciplinary knowledge. Over the years, English studies has built a rich body of literature, with myriad formulations of both scholarly and practical import. Understandably, when confronted with a new social challenge (like digital reading), the default move is to deploy our disciplinary knowledge to address the challenge. This involves a process of adaptation, in which scholars look for points of contact between the old and new. Such reformulation can be productive, of course, but we need to assure that the search for points of contact doesn't prevent us from exploring the unknown.

Jacob Craig, adapting an idea originally forwarded by Ben McCorkle, has recently distinguished between "strategies of immediacy" and "strategies of hypermediacy" in efforts to promote digital literacy (30). The former strategy involves emphasizing similarities between old and new technologies. The latter involves emphasizing what new technologies can do differently and perhaps better. Recent digital reading scholarship, in an effort to adapt existing disciplinary knowledge, has largely pursued a strategy of immediacy. As such, the unique affordances of digital reading technology have been overlooked. And simply put, these new affordances are massive. Writing in 2015, Richard Miller notes that more information is now available to him via his smartphone than any library has ever contained. This idea is both true, almost to the point of cliché, but also, I would claim, largely ignored by reading scholars. When the reality of information abundance is acknowledged, as we have seen, it is usually approached through the lens of "distraction." Information access, in this formulation, rather than being a resource, is a liability. A strategy of hypermediacy, the sort of strategy I wish to pursue, inverts this dynamic. It acknowledges the reality of

information abundance and omnipresent connection, and the extent to which this reality has disrupted older paradigms of reading, writing and learning, but rather than trying to modify older paradigms, sets out for unexplored territory. This means asking how can we use the tools at hand, and their unique affordances, to read in new and better ways.

The Reading Behaviors of Digital Experts

To help students unlock the unique advantages of reading on the screen, we first need to know what those advantages are. One way to learn is to examine the literacy practices of those most attuned to our current information environment. By studying how these individuals read, we can gain insight into how meaning might best be made via screens, internet search and other common digital tools. Fortunately, a pair of recent empirical studies have examined the literacy lives of digital experts. The first study, conducted by SHEG and mentioned above, cast professional fact-checkers in the role of expert. It monitored their behavior, along with that of historians and undergraduates, as they engaged in an online reading task. Though the SHEG study focuses specifically on source evaluation, its findings also provide insight into how readers might use digital tools to facilitate comprehension more broadly.

The second study to be examined, conducted by Angela Kohnen and Gillian Mertens—two education scholars—focuses on what the authors call "expert generalists." These are people who by virtue of education or profession have developed the ability to "find and assess information across a range of fields or topics" (4). Again, this study doesn't engage reading comprehension directly. Instead it explores learning behaviors. Through a series of surveys and interviews, the authors seek to reveal the "motivations, values, personal characteristics, and positioning," the entire "identity of practice" which underpins expert generalists' ability to "be, know and do" (5).

All told, these studies have very different aims and methodologies. They are connected, though, in that they both depict readers skilled at harnessing the unique affordances of digital space to achieve literacy goals. By viewing them in light of one another—and in light of some related writing studies literature—we can piece together a picture of the "expert digital reader."

1. Expert Digital Readers Are Networked Readers

The SHEG study is notable for the wide disparity in outcomes observed. Unlike the professional fact-checkers, both PhD-level historians and undergraduate students largely failed the digital reading tasks set by the researchers. In one experiment, for instance, the researchers asked the participants to compare the reliability of information found on two websites. One website was maintained by a prominent pediatric organization, described as "the largest professional organization of pediatricians in the world" (9). The other was maintained by a much smaller group of anti-gay pediatricians and betrayed anti-gay bias. Given 15 minutes to evaluate each source, only 20% of students and 50% of historians were able to recognize the latter site's problematic nature. On the other hand, 100% of professional fact-checkers were.

The SHEG researchers identify two types of reading behaviors which they believe were essential to the fact-checkers' success. They label these behaviors "taking bearings" and "lateral reading," respectively. In explaining the first behavior, the researchers draw an analogy to the world of navigation. "When navigating unfamiliar terrain," they write, skillful explorers "first gain a sense of direction" (14). This means zooming out, seeing where things lie in relation to one another. For internet-based documents of unknown provenance, such as the ones in the study, "taking bearings" means looking beyond the text at hand, and doing so before reading, so that one can understand what one is reading.

Tellingly, the SHEG researchers found that the digital experts spent very little time on the target text (often only seconds) before seeking out additional resources. To facilitate the process of discovery, they engaged in a second key behavior, "lateral reading," described as a "powerful heuristic for taking bearings" (24). Lateral reading, in the context of the study, entailed opening a series of web browser windows in addition to the target text. Within these windows, the fact-checkers performed research to contextualize the target. Using Google, Wikipedia and other easily accessible resources, they explored, for example, the history and reputation of the website's sponsor, as well as what others say about the facts and ideas presented. The fact-checkers studied on average six additional sources before making a judgment as to the reliability of the target text (25). Such reading behavior is in striking contrast to that of both the

professional historians and Stanford undergrads. These participants typically read "vertically," moving down the page in a linear fashion. They were slower to engage supplementary material and when they did so, utilized such material less extensively. Instead, they stayed largely within the four corners of the text and tended to fixate on design elements.

As noted, the primary goal of the SHEG study was to examine source evaluation skills. More broadly, though, the study's findings provide insight into how digital experts utilize the unique affordances of digital reading technology. Though such technology certainly allows for many new and productive forms of engagement, the available data highlights one affordance in particular: the ability of the digital reader to quickly and easily access information as to contextualize what one is reading. Whether reading a website, e-book or PDF, nowadays, when we read on the screen, we typically have ready access to the internet and the wealth of information it offers.[2] Simply put, with the change from paper to screen, comes change in what readers can (and perhaps should) do as they read. The fact-checkers in the study, more so then either the historians or students, were able to exploit reading's new material base. What knowledge, skills and attitudes allowed them to do so? The SHEG researchers point to two possible answers. First, while both digital experts and digital novices used shortcuts, or *heuristics*, to facilitate comprehension, the experts' heuristics were better suited to the digital environment. Specifically, while the novices' default moves looked *to* the text (E.G. checking for references), the experts' default moves looked *beyond* the text (E.G. taking bearings and lateral reading). The experts' heuristics were thus tailored to engage the most powerful affordance digital technology offers: information access. Relatedly, once beyond the text, the digital experts could make sense of what they found there. They possessed "knowledge of sources, knowledge of how the Internet and searches are structured, and knowledge of strategies to make searching and navigating effective," the researchers write (39).[3] Again, as with their heuristics, what these readers know is uniquely tailored to help them get the most out of commonly available digital tools. Unlike the historians or students, they are true digital natives, their reading practices specifically designed for a networked world.

So, to summarize, from the SHEG study we learn that the "expert digital reader" is one who intuitively looks beyond the target text and once there, knows how to find information to help them better understand what they are reading. We also see the limitations of reading practices which stay within the text, no matter how "deep" those practices might be. More generally, from the experience of the participants, we see that while the unique nature of digital space might interfere with traditional modes of reading, it opens up new opportunities for meaning making. These opportunities often involve access to information that can be used to contextualize a specific text or claim. Both the experts' default heuristics and knowledge set were formulated to help promote contextualization.

A turn to the writing studies literature reveals why contextualization is important. Writing scholars have often taken what Christina Hass and Linda Flower call a "constructive view" of the reading process (167; also Bazerman). This view holds that reading comprehension demands the construction of a schema, or conceptual map, within which a target text can be situated. According to Hass and Flower, schemas are "complex networks, like dense road maps, made up of many nodes of information," that contain representations of text, prior texts, and context (168). Tellingly, the richer a schema a reader can construct, the deeper their understanding will be. In particular, Hass and Flower find that experienced readers are often "rhetorical readers" in that they engage in "an active attempt at constructing a rhetorical context for the text as a way of making sense of it" (167). Rhetorical readers, in other words, consider not just the content and design of a document, but the circumstances of its creation. Their schemas include representations of author intention, audience, and other non-textual factors. Less experienced readers' schemas often lack such representations.

Taking a constructive view of the reading process, we see how the fact-checkers were able to perform successful source evaluation. Simply put, despite knowing little about the topics at hand, they were able to use digital tools to quickly build complex schemas. The construction process starts with a task conception. Tasked with judging reliability, the experts populated their schemas with information about the circumstances of the texts' creation, as well as content knowledge which allowed them to judge the accuracy of the claims offered. In this case, the overall goal was to determine which website was more

credible. We can easily see, though, how, given a different task conception, the same process could be used to achieve other literacy goals. Alice Horning writes that expert readers know where to "put the manicules," meaning they know how to identify key points in a text in light of their needs as a reader. This sort of comprehension, she argues, is achieved not just by engaging the ideas in a text, but via work "behind, after and beyond the reading" ("Manicules" 4). Here we see what form such work might take in a digital era. Expert digital readers, we can say, seek to situate what they read, each text's claims and perspective, within a broad network of data points. Mastery of digital tools and associated practices, such as lateral reading, allow them to construct such networks.

All told, the SHEG study suggests that expert digital readers are "networked readers" in that they use the internet's networked properties to accomplish reading goals. When confronted with a challenging text they use digital tools to build their own bespoke knowledge networks, allowing them to identify and process needed information. Digital novices, if the SHEG study is any sign, operate within a different paradigm. They too build schemas to achieve comprehension, but don't harness digital affordances to supplement these schemas. They emphasize text over context, form over content. As a result they are left with weak evaluative frames.

Why did the students fail to look beyond the text? Ellen Carillo suggests that it is because they did not see themselves as active meaning makers. Carillo claims that high school reading pedagogy promotes an uncritical "reverence for texts" ("Navigating" 145). The contribution of the reader to the meaning-making process is obscured and thus readers become passive, unable to question or challenge what they read. My analysis follows Carrillo in suggesting that perception of the reading process is indeed key. Digital reading experts, the evidence indicates, are indeed active meaning makers. They also display a degree of humility. Digital reading experts know that they can't approach a complex text on an unfamiliar topic cold and expect to accomplish their goals. They recognize that sometimes reading well requires learning.[4] And to learn, one must look beyond the target text. This recognition goes hand-in-hand with an understanding of the vast affordances of our shared digital tools. Networked readers, we can say, view the digital interface—the reading surface of the internet-connected phone, tablet or computer—as three-

dimensional, in that every word or idea can open up to a vast network of related data points. In other words, they recognize that the screen is very different than a piece of paper. Their most potent reading behaviors, such as taking bearings and lateral reading, in turn, are based upon such a recognition.

2. Expert Digital Readers Build Diverse Networks

The second study to be examined, by Kohnen and Mertens, focuses on the information-seeking behaviors of so-called "expert generalists." The concept of the expert generalist is one that I believe deserves more attention within English studies. The modern information landscape, as Kohnen and Mertens argue, is uniquely dynamic. Tools, genres and information channels change rapidly, and what works one day, in one context, may not work in another. Expert generalists are able to thrive in such an environment. They are not content specialists, but expert learners. They are able to find and organize bits of disparate knowledge as to move from knowing to understanding, as Lynch and Carillo use those terms. In an age defined by decontextualization and fragmentation these are essential skills.

Though it focuses on learning behaviors rather than reading per se, Kohnen and Mertens's study is useful because it provides insight into how expert generalists, as readers, go about constructing the schemas which allow them to understand complex texts on unfamiliar topics. In other words, while the SHEG study sheds light on the *what* of networked reading, this study sheds light on the *how*.

As with professional fact-checkers, expert generalists engage in an active process of orientation, or "taking bearings," before engaging a difficult topic or text. Interview data from Reuben, a writer of popular science books, is telling. He admits that sometimes primary source material, particularly academic research articles, are too technical for him to understand at first pass. His solution is to read outside the text and at a "much lower level," then to return to the original source once he has a grasp of the terminology used and issues at stake (10). Crystal, a research librarian, similarly speaks of using outside sources, "academic databases, Wikipedia, YouTube, colleagues, listservs [and] social media groups," in order to get her bearings before tackling a complex text (10). So, once again, we see readers who seek to understand target texts by looking beyond those texts. Integrally, these experts use different genres and information sources

to supplement each other. Unlike, say, the historians in the SHEG study, they don't privilege any specific genre or type of source (E.G. primary or academic). Instead, they recognize that genres and sources are tools, and like all tools, serve different purposes, and thus are often best used in combination.

As Crystal's comments indicate, expert generalists utilize both mediated and interpersonal sources. For instance, numerous interview subjects speak of the importance of seeking out "guides," individuals who can answer questions and provide advice about how to approach a topic (12). These guides might be subject matter experts or other generalists, and might be personal acquaintances (Crystal's "colleagues") or strangers accessed via electronic means (participants in her "social media groups"). Once again, the key insight here is that expert generalists are willing and able to make full use of all available information channels. To achieve understanding, they read, watch, listen, ask—whatever might help them learn.

But how do expert generalists know what they need to learn? In other words, how do they sequence their information exposure to construct useful schemas? Kohen and Mertens's data suggests that two related behaviors are key. First, expert generalists are particularly adept at asking questions: of themselves, of others, and of information resources. For these learners, "questioning [is] a multifaceted process," the researchers write, one that includes both "knowing how to ask a question and knowing what to ask of whom (or what)" (13). Facility in questioning is underpinned by dispositional tendencies, such as curiosity, skepticism and a commitment to accuracy. It is facilitated by knowledge of available resources, what those resources might be used for and how they might be accessed. For example, a journalist researching new cancer treatments might utilize a list of local medical professionals—potential "guides." She might look up technical terms in a medical dictionary and more basic concepts on a consumer website such as Web MD. To build a successful schema requires knowledge that such resources exist and facility at querying them to obtain necessary information. It also requires knowing *when* to utilize each resource. Expert generalists, it appears, obtain this knowledge through a second key behavior: self-monitoring. As they gather information, Kohnen and Mertens write, expert generalists constantly "[monitor] their own comprehension" (13). When reading, this means recognizing what one doesn't know, what one doesn't understand. It means asking if one's reading goals are being achieved and if not, why not. *What does this*

word mean? Why is the author making this claim? For expert generalists, these sorts of questions act as triggers, prompting them to move beyond the target text and into their portfolio of information resources. There they obtain information to answer the questions, thus building out their schemas.

Kohnen and Mertens find that apart from being intellectually promiscuous and skilled at questioning and self-monitoring, expert generalists are also skilled at synthesis, defined as the act of looking "across information sources" as to identify "patterns and contradictions" (13). Integrally, moving beyond the text in this manner can help readers better understand specific texts. In her "meta-reader" theory, Horning ("Manicules") describes this dynamic. She argues that expert readers are skilled at both analysis—breaking a text into pieces—as well as synthesis—connecting those pieces with pieces from other sources. These processes are mutually sustaining. Once a reader identifies the larger concepts animating a conversation, for instance, they are better able to parse specific texts. Once parsed, additional connections can be made. This insight hints at the necessarily recursive nature of schema construction. Indeed, Kohnen and Mertens's data reveals that expert generalists constantly return to sources as their understanding evolves. With each return trip, we can imagine that the questions they ask of themselves and the target text grow more sophisticated. With each movement outward, the same occurs in regard to outside sources. Through this recursive process of questioning and exploration, new relationships emerge and previously opaque ideas become legible.

Earlier I suggested that the expert generalist provides a model for the sort of readers we want to cultivate in English class and indeed across the university. Simply put, these are readers who are defined by flexibility, who can read and understand extended informational prose, digital or otherwise, wherever they might encounter it. The above analysis indicates that expert generalists achieve understanding not by close reading of single texts, but through skilled construction of extensive and diverse schema. In particular, as readers, expert generalists are skilled at 1) utilizing a wide variety of environmental affordances in schema construction, and 2) using different genres, modes and information sources to supplement each other. The ability to self-monitor, along with knowledge of various information resources and how to access them, facilitates such activity.

The above insight into the behavior of expert generalists, I'd suggest, changes how we might understand "lateral reading." As we saw earlier, the SHEG researchers define lateral reading rather narrowly, I.E. as the process of opening up additional tabs in a web browser. In my analysis of their work, I argued that such behavior is useful because it allows for contextualization of a target text. We now see that in the wild this same end might best be achieved not simply by opening additional tabs, but by seeking information on different platforms, in different genres and modes. The concept of lateral reading, I'd suggest, can be productively expanded to capture this sort of multimodal, multiplatform engagement. Indeed, it appears that for many readers, such activity is already a part of daily life.

In his insightful book, *Chasing Literacy: Reading and Writing in an Age of Acceleration*, Daniel Keller examines contemporary youth reading practices. His data reveals behaviors very similar to the expanded concept of lateral reading presented above. A high school student named Nadia, for instance, is shown to supplement her reading of printed history books with information garnered from online news sites. Her juxtaposition of the "long perspective" with the "now," the printed with the digital, is felt to increase her overall understanding (68). Another student, Diana, is shown to engage in even more elaborate lateral reading behavior. She tracks news stories about topics of interest on TV, radio and the internet, gathering keywords which she uses to find more instances of coverage via internet search. As she engaged her various sources, Diana's reading behavior was "analytical and evaluative," Keller writes, in that she "compared texts, examined differences, and sought to understand reasons for the differences" (116). All told, in Keller's description of Diana we see an example of a reader effectively and seemingly intuitively combining various environmental affordances to promote understanding. She uses various sources, in various modes, to supplement one another and as she reads, synthesizes what she finds. When read in light of Kohnen and Mertens's study, Diana's case, and that of other students described by Keller, indicate that young people might already be engaged in sophisticated digital reading behaviors. The key is tapping those experiences in the classroom.

Cultivating Networked Readers

In the above pages, I've drawn on recent empirical work, and some key writing studies literature, to argue that successful digital readers are networked readers: they utilize heuristics designed to exploit digital affordances. Chief among these is lateral reading, the act of reading across sources as to build a rich conceptual schema as to understand a target text. A functional schema contains information about both content and context. The best digital readers are those that know how to use all available resources to efficiently obtain this information.

My study of digital expertise has sought to answer a simple question: how might university teachers help students read and understand complex digital documents? As noted, such documents, often featuring extended informational prose, are an important part of literate life. That said, in the digital age, useful information comes in all forms. Thus, it is important to be clear that lateral reading, as I've defined the term, while it may start and end with alphabetic text, may very well lead to engagement with non-alphabetic sources. Of course, one textual document can act as a gateway to another, such as when reading popular science writing helps one understand a technical academic article. Just as often, though, non-textual genres—a podcast or TED Talk, say—can perform a similar function, perhaps more effectively. All told, digital experts have broad portfolios of potential supplements; they know what each is good for, when to use it and how to query it. They are also willing and able to mix levels (popular/academic) and modes (textual/audio/video/interpersonal). The primary digital affordance, remember, is information access. By not limiting themselves either to the target text or certain modes or genres, digital reading experts are able to exploit this affordance to the fullest.

1. The Networked Mindset

Admittedly, my understanding of what makes a successful reader differs substantially from what I earlier identified as the current paradigm in English studies. In short, I claim that a successful digital reader is one that can use ready information access to improve comprehension. This is not to dismiss the

importance of understanding why one is reading (Morris) or the intricacies of one's own reading process (Carillo). But it is to suggest that instruction in genre or reading strategy should be supplemented with activities designed to help students think beyond the page.

A comparison with Tanya Rodrigue's work on digital reading—composition's most substantial treatment of the subject to date—can clarify my intervention. As noted above, Rodrigue argues that increased genre awareness can help improve digital reading comprehension. In turn, she presents several activities designed to help students recognize how digital documents work, and the similarities (and differences) between types of documents, knowledge which can presumably inform future reading practices. Now, I admit I'm intrigued by the activities Rodrigue proposes. For instance, she shows that via exposure to and reflection on their engagement with an unfamiliar genre (a piece of link-studded "hyperfiction"), her students came to understand the importance of mining existing genre knowledge to create a consciously designed "personal map" for each text they read ("Genre" 250). These students, it appears, gained important insight into how to read with purpose; self-monitoring skills were certainly cultivated. That said, despite featuring a multimodal hypertext, Rodrigue's proposed activity does little to engage networked affordances such as omnipresent connection and unlimited information access. At no point are students asked to move beyond the target text. In this regard, her pedagogy is artificially separated from both a wealth of information resources and her students' real-life literacy behaviors (which, as we've seen, are often quite networked). The result, I'd argue, is an artificial limit on pedagogical potential.

Returning to Keller's *Chasing Literacy*, we can see the shortcomings of digital reading pedagogies which don't help students unlock the potential of their digital reading tools. In a fascinating sequence, Keller describes the reading behavior of a young man named David. David is depicted in his bedroom, simultaneously playing a computer game, bidding on eBay, checking scores on ESPN.com, and researching financial aid on a university website. In the scene described, Keller identifies several behaviors which he believes define contemporary literacy, particularly multitasking and what he calls "oscillation," defined as the rapid switching between reading "depths" and levels of attention. Notably, we also see here a failure of literacy. After navigating to the university website, David clicks on a "Financial Aid" link. He scrolls

down the page, oscillating between moments of deep reading (up to one minute long) and periods of scanning and link selection. He attempts to use the site's integrated search engine but finds it unwieldly. Finally, after several more attempts to navigate the site, he gives up, unable to find the information he needs.

David's literacy failure can be understood on a number of levels. Keller suggests that students like David need explicit instruction in how to multitask effectively, as well as guidance in digital reading tactics and technical skills (such as how to use site-specific search engines). Rodrigue advances this line of thinking by drawing our attention to the importance of genre awareness. David is able to navigate digital genres with which he is familiar or which share formal features with familiar genres. ESPN.com falls into the latter category, apparently, with David stating it is easy to use because "it looks so much like the TV" (107). When confronted with a complex text structured in an unfamiliar way, though, he falters. Rodrigue would likely suggest that to perform better, David needs guidance in uncovering and deploying existing genre knowledge. Understanding how the university website is structured and how it compares to other sites (like ESPN.com) is seen as key.

While not discounting the importance of this sort of formal knowledge, I suggest we pay more attention to the role of content knowledge in David's reading behavior. Given the tools at his disposal, there are numerous content-focused moves David can perform to make his literacy activity more productive. For instance, Keller believes that David is hampered in his information search because of his "fuzzy understanding of financial aid" (109). Simply put, he can't effectively query the university website because he isn't sure what question he is trying to answer. Obviously, he can't make this determination by studying the formal features of the site. Instead, like the students in the SHEG study, David needs to zoom out and orient himself. First, he needs to recognize that his reading goals aren't being met. He then needs to leave the page; specifically, he needs to engage outside resources as to learn about financial aid and its associated problems. This will allow him to develop a more well-defined research question. With a specific question in mind, he can return to the target text. Orientation here, as is often the case, could perhaps best be achieved by approaching his topic at a "lower level." Using lateral reading, for instance, David could open up a new web browser tab and do a Google search for "financial aid problems [school name]." This might bring him

to the social media site, Reddit, in which, on certain school-specific "subreddits," students discuss shared school matters, including, of course, financial aid problems. Information collected here could help him build out his financial aid-related schema and define his problem, allowing him to productively engage the content on the university website.

Of course, given the tools at David's disposal, he has access to an innumerable number of potentially useful information sources. My claim is that reading pedagogy should help him recognize and take full advantage of them. Key to this is cultivating what we might call a "networked mindset." Challenged by a complex, unfamiliar document, David's default move should be to look beyond it—to consider outside resources and how they might be of assistance. Sometimes, supplementation will involve things as simple as looking up words in an online dictionary or reading the gloss of key concepts on Wikipedia. Other times, it will involve extensive outside study, implicating, say, a YouTube video, a technical report, and an email conversation with a guide. The key point, once again, is that the best digital readers are networked readers. They are quick to look beyond the text and know how to utilize digital resources to build schemas sufficient to accomplish their reading goals. As we've seen, sometimes our students exhibit such behavior. And sometimes they don't. I claim that digital reading pedagogy should be designed to highlight and propagate networked tendencies. Despite their obvious virtues, current approaches typically don't do this. As we saw in Rodrigue's proposal, the emphasis is on the reader and the text, to the exclusion of the world beyond. This limits our ability to cultivate networked readers.

2. Reading-Writing-Research

One might argue that to teach networked reading is to turn reading instruction into research instruction. There's truth to this claim. My analysis indicates that the best digital readers, through mastery of common digital tools, seamlessly blend reading and research. Digital reading pedagogy should help students do the same. As noted, networked reading starts with self-monitoring. Self-monitoring allows readers to generate questions which can then structure lateral reading activity. The desire to read laterally,

as we've seen, is facilitated by a networked mindset. The ability to read laterally is facilitated by knowledge of potential information sources and how they might be used.

Of course, the type and degree of lateral reading required to "put the manicules" will inevitably vary. An undergrad reading Ta-Nehisi Coates to levy a response must do very different work than an MA student reading a lab report to crib a method. Network reading cannot supplant any other reading strategy or disciplinary approach. The undergrad still needs to pay close attention to Coates's use of metaphor. The MA student still needs to locate the report's methodology section. In both cases, though, evidence suggests that when reading goals are frustrated, readers can benefit by looking beyond the target text. They can benefit by having a wide portfolio of potential supplements and knowing when and how to use them. These are the ideas at the heart of networked reading.

If we accept the value of networked reading, the next question becomes where to teach it and how. As to the first question, I believe a case can be made that any teacher who expects students to read complex digital documents needs to teach networked reading habits. This means, at the most basic level, explicitly encouraging students to use outside resources to supplement comprehension. There are certain information resources with which all digital readers need to be familiar. At the moment, Google search, Wikipedia and YouTube seem to fit in this category. No matter the subject or discipline, instructors should consider how they can help students utilize these resources to build out schemas and promote comprehension. Instructors might also consider identifying for students information resources of particular value in their specific class or discipline. Literature teachers, for instance, might draw students' attention to literaryterms.net or the podcast, *Pod and Prejudice*; engineers might highlight the wealth of resources at IeeeXplore. Each would want to explain how these resources can be accessed and how they can supplement course readings. The engineer, for instance, would show her students how to create an IEEE account, how to search for a particular standards document, and how such a document could provide valuable context for a course reading on Abu Dhabi's new "smart grid." When done consistently, highlighting supplemental sources in this manner can help students see that complex digital documents are best approached as part of consciously

constructed information networks, as well as helping them develop the resource portfolios necessary to construct such networks.

Of course, digital space is dynamic: new potential resources are always emerging. Instructors may also feel that they don't have much expertise to impart. These challenges can be overcome by urging students to reflect on and share their existing supplemental tools and techniques. As we've seen, student reading practices are often inherently networked. Moving between Wikipedia, the class Whatsapp group and a PDF document, say, students naturally engage in proto forms of lateral reading. The key is to help them recognize and optimize such behavior. Reflection on current practice is essential. Reflection might take the form of analysis on how one read a certain course document. *Did you read "laterally" or "vertically"? Did you draw on any outside resources? What for?* A more involved activity may entail providing students a certain document and reading context, and asking them to formulate a set of reading goals and identify the work necessary to accomplish those goals. They could then consider how outside resources might assist such work. *What am I trying to achieve here? What do I need to know to achieve it? Where and how can I get this information?* These are the basic questions networked readers ask. Reflective activities allow students to practice asking these questions. Conducted at the class level, they also produce a valuable stockpile of sharable resources and information-access techniques.

So far, I have discussed teaching strategies that might be of use across the disciplines. Research-based writing courses stand out, though, as a particularly potent site from which to impart networked reading skills. In addition to teaching the basics of online research, such courses might be sequenced to encourage exposure to and synthesis of diverse forms of information. Students can be moved to look across disparate sources, modes and genres, and identify "patterns and connections," as to create richer, more elaborate conceptual schemas. Once constructed, schemas need to be tested. Thus, students in a networked reading-informed research course would be given the time and opportunity to return to previously examined texts and reflect on how (and why) their understanding has evolved. Through this recursive process, they could practice self-monitoring and hone their questioning abilities. In doing so, they could come to

understand, on an experiential level, that no text is legible in isolation. They could start to see that often, the best way to understand a text, is to look beyond it.

Overall, composition's research-writing literature provides ample resources to help actualize the above pedagogy. There are also significant obstacles to the embrace of a networked reading paradigm, though. Earlier, I spoke of the danger of letting disciplinary norms blind us to new opportunities. James Purdy and Joyce Walker suggest that such blindness might exist in the way that English studies scholars teach research. Upon review of popular instructional material for research writing, they note "a desire to maintain the purity of academic research by limiting (or ideally eliminating) potentially polluting outside influences" (16). This desire for purity manifests as the fetishization of traditional academic materials accessed via the college research library. Purdy and Walker, in challenging this stance, advocate for the legitimacy of and importance of working with non-academic genres and sources (E.G. Wikipedia). They believe, as I do, that many students already engage in sophisticated (networked) research behaviors. Research writing pedagogies should seek to connect these behaviors to academic research activity, rather than set up the latter as separate and better.

In recent years, some writing scholars have begun to embrace the ideas at the core of Purdy and Walker's approach (see Locklear for an in-depth example; also Craig). These scholars recognize the importance of helping students engage the full array of information available to them. The concept of the networked reader can productively supplement such efforts. It is particularly amendable to pedagogies which position students as active knowledge-makers outside the confines of a particular set of disciplinary methods and materials. Sarah Ann Singer has recently presented such a pedagogy. Noting an increasing "public-professional overlap" in academic research practices, Singer makes a case for research writing courses which move students to engage a wide range of sources and genres (156). She models such a course in the form of a medical/health humanities elective in which students draw on "peer-reviewed journal articles alongside personal blogs, memoirs, interviews, and newspaper and magazine articles, as well as social media posts, hashtags, and crowdfunding platforms" to create original knowledge about contested medical issues (155).

Singer is particularly interested in what she terms "wildcard sources." These are sources about contested or underexplored topics, often containing knowledge based on experience, rather than formal scientific research. Patient testimonials and the statement of for-profit companies are presented as examples. In a traditional research writing paradigm, such forms of information might be dismissed as unreliable or lacking in rigor. Singer rejects such a view, arguing that they can be useful, if students know how to use them. Towards this end, she presents her students with a simple "rhetorical chart" which asks them to consider the genre, purpose, audience, role and rhetorical situation of each text they encounter. This heuristic (to use the language of the present essay) draws attention to the perspective and rhetorical goals of each source, providing students with guidance as to how they might incorporate information from the source into their writing and thinking.

All told, Singer's proposed pedagogy provides an apt example of how a research writing course might be structured to cultivate network readers. It displays an intuitive grasp of what we might call the "logic of supplementation." This is the idea that knowledge is best built not through sameness, but difference. As students build a "constellation of conventional and wildcard sources," I'd argue, how they perceive the various objects within will evolve (169). This mimics at the course level the same logic which underlies the concept of networked reading.

Singer's pedagogy also advances current practice in foregrounding digital affordances and the very real ability of undergraduate students to harness them to create original knowledge. Students in Singer's course use the internet to seek out and engage fact and opinion, secondary and primary sources, textual and multimodal forms. Such work helps introduce them to the wealth of knowledge-making resources available right in front of them. Singer's simple rhetorical chart, in turn, helps them make sense of what they find. Again using the language of this essay, this heuristic helps students "read rhetorically" as to fill out the context portion of the schema by which they understand each text. Such understanding allows them to identify and internalize the useful elements, adding data points to their more generalized topic schema. Facility in this process of searching for information sources, selecting the most useful pieces of information (analysis) and combining those pieces (synthesis), as I've tried to show, defines the literacy activity of the

very best digital readers. This being the case, we can imagine that an eclectic research writing program, such as Singer proposes, combined with active instruction in lateral reading, would be a potent way to cultivate digital reading skills.

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It's an old cliché that when one door closes another opens. In essence, though, that's what has occurred with reading practices. Technological change has brought instantaneous connection and infinite information access. As a result, distraction prevails, rendering prior reading practices, defined by depth and linearity, more difficult. My claim in the above pages has been that the very same changes open up new paths to comprehension. In particular, readers can now more easily gather information to contextualize what they read. Expert digital readers, I've argued, are particularly skilled in this regard. They recognize the importance of looking beyond the text and are quick to do so. Once beyond the text, they know how to find useful information and put what they find to work. I've argued that both a networked mindset and skillset can be taught. To cultivate the later, I've suggested explicit instruction in lateral reading, broadly conceived. To cultivate the former, I've suggested pedagogies which emphasize online research and the productive combination of different forms of knowledge. The underlying idea, in both cases, is to work with, rather than against the reading environment as it now exists.

Notes

[1] A note about terminology. In the following pages, unless otherwise stated, a "text" refers to a document that contains extended informational prose. Such documents typically feature both textual and non-textual elements. "Alphabetic text" is used as necessary to refer to the textual elements in isolation. Texts can either be accessed via print or digitally, via screens. Digital texts can be further categorized as internet-based (E.G. a webpage) or non-internet based (E.G. a PDF document saved on a computer hard drive).

[2] This is not to deny the problem of disparate access to technological resources (the so-called "digital divide"). If anything, the networked reading paradigm means we must pay more attention to inequality.

[3] Notably, none of this knowledge was particularly esoteric or technical. It involved things like recognizing when one needs to put quotes around a search term.

[4] I suspect that scholars might be blind to this point because when approaching texts in our discipline our schemas are already flushed out—there's no need to build an ad hoc structure.

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