Supporting the Development of Upper Elementary School Students' Online Research and Comprehension Skills Through a Reframed Guided Reading Framework

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Abstract

Today's students are increasingly required to use skills when conducting online research for

academic purposes. However, students may be unable to transfer their reading skills with printed

texts to reading online texts in upper grades and beyond. Strategic actions required for online

research are extended to account for the unique, complex reading environment of the Internet as

readers locate, navigate, evaluate, and synthesize information across multimodal sources. The

guided reading framework, a popular instructional framework that is widely adopted in U.S.

elementary schools, lends itself to supporting students' use of strategic actions as they conduct

online research. Informed by theory and practice related to new literacies, digital literacies,

reading development, and 21st century literacy demands, this manuscript proposes an

instructional framework that utilizes the structure of a traditional guided reading lesson with

printed texts to teach online reading and research skills in the upper elementary grades. Specific

instructive examples, teacher tools, and additional instructional supports are provided to aid

teachers' use of the Online Guided Reading Framework as they work to develop students'

strategies for online inquires.

Keywords: digital literacy, online research and comprehension skills, Internet inquiry, guided

reading

Today, 21st century technologies have transformed the way we acquire information. With technology at their fingertips, many readers likely turn to the Internet, obviously a widely used source for locating information, gaining new knowledge, and being entertained. The same is true for many of our students. Students from ages 8 to 18 spend more time reading on a screen than reading traditional printed texts (Rideout, Foehr, & Roberts, 2010). However, they are doing so with little guidance and support from schools (Hutchison & Reinking, 2011). Without specific instruction and experiences learning how to read, comprehend, and research in digital contexts, students may be unable to (a) transfer some of the skills they learned to use with printed texts to online texts and (b) learn new skills that are specific to reading and comprehending online.

According to Leu and his colleagues (2015), the achievement gap in literacy is increasing and may be even larger than the data indicates. Current national assessments measure offline printed text reading skills, but do not account for online reading and research tasks. In a study that assessed skills critical to online research and reading, Leu et al. (2015) noted that seventh grade students from an economically advantaged school performed nearly two times higher than students from an economically challenged school. However, even students in the economically advantaged school were only able to respond correctly to half of the tasks and prompts (Leu et al., 2015). These research findings necessitate a change in instruction that better prepares students with effective online research and reading skills.

Since students are increasingly required to conduct research in middle and secondary schools, instruction in online research skills must begin in the elementary grades. As traditional reading and research skills develop throughout elementary school, students must begin to use

more complicated and multiple types of text including those online. They must receive

continued guidance and support in developing their digital literacy skills as they shift to online

research and reading (Castek & Dwyer, 2018; Leu et al., 2015). In this manuscript, we propose

an Online Guided Reading Framework (Van Allen, 2016) that utilizes the structure of a

traditional guided reading lesson with printed texts to teach online reading and research skills in

the upper elementary grades (ages 9-12).

Theoretical Foundations

When considering the design of the Online Guided Reading Framework (Van Allen,

2016), two theoretical perspectives guided our approach. First, we drew upon New Literacies

theory (Leu, Kinzer, Coiro, Castek, & Henry 2017) to consider how technology is influencing

literacy education in the 21st century and the instructional practices associated with the digital

literacies required of 21st century readers and researchers. Second, we adapted the guided

reading framework design (Fountas & Pinnell, 2001, 2012) as a context for teaching online

research and comprehension skills through explicit modeling and strategic prompting (Van

Allen, 2016).

New Literacies Theory

Rapidly developing multimodal texts and new technologies are continually shifting our

definition of literacy. Each new technology and/or text type results in the development of

specialized digital literacy skills, discourses, and social practices (Leu et al., 2017). In order to

account for and explain the ever-changing nature of these new literacies, Leu et al. (2017)

proposed a dual level theory, uppercase New Literacies theory and lowercase new literacies

theory. Lowercase new literacies theory explores new technologies, programs, and text types, by

studying the knowledge, skills, and dispositions that surround these specific areas of new literacies. Therefore, lowercase new literacies are endlessly changing and growing in response to the shifting landscape of technology. Lowercase new literacies theory is informed by the broad "common and consistent patterns being found in lowercase literacies and lines of research" (Leu et al., 2017, p. 4) of uppercase New Literacies theory. The common assumptions and principles of uppercase New Literacies theory guided our understanding of how these new literacies are altering our worldview and how we educate students in today's world.

Although uppercase New Literacies theory helps educators understand the way that online research and comprehension skills are changing instructional approaches and content taught, lowercase new literacies theory helps educators understand the attributes of online research and comprehension skills that need to be taught to students directly or indirectly.

Many researchers have concluded that reading texts on screen, especially when conducting research, incorporates more multilayered, complex skills and strategies than when reading traditional printed texts (Afflerbach & Cho, 2010; Coiro & Dobler, 2007; Harrison, 2018; Leu et al., 2008). One of the most important differences in the new literacies of online reading and research is the understanding that each individual reader self-directs his or her construction of knowledge through online texts (Leu et al., 2017). No two readers will follow the same exact pattern of hyperlinked text as they inform their understanding of a topic or problem, making text construction a unique and self-directed process. Additionally, as readers choose and navigate their own reading path, they must stay focused as most online texts are full of distractions that take a reader away from the inquiry, from targeted advertising to hyperlinks (Coiro & Dobler, 2007).

While some of the same strategies can be used when reading both traditional and online texts, readers must also employ additional skills, strategies, dispositions, and practices that are specific to online texts (Afflerbach & Cho, 2010; Harrison, 2018; Leu & Maykel, 2016). These additional skills, and strategies expand and build upon traditional reading strategies in complex ways, ensuring that online reading comprehension is not isomorphic with offline reading comprehension (Coiro & Dobler, 2007; Leu et al., 2017). Specifically, reading on the Internet requires readers to:

1) Define important questions or problems

2) Search for and locate information

3) Critically evaluate information

4) Synthesize information from multiple sources in a variety of text formats (video, audio, etc.)

5) Read and write to communicate findings (Leu et al., 2017)

These skills and strategies must be directly taught to students in collaborative environments to improve students' comprehension of and learning through online texts. Components of the Online Guided Reading Framework (Van Allen, 2016) were designed to facilitate support in developing students skills and strategies for online inquiries.

Guided Reading

Guided reading is a popular instructional framework that is widely adopted and used in United States (U.S.) elementary schools. Guiding reading usually takes place in a small student group format and it has a specific, almost prescriptive structure for providing differentiated teaching that is aimed to support students' developing reading proficiency (Fountas & Pinnell,

2001). The purpose of guided reading is to provide scaffolded instruction and support prompts

to students as they interact with printed text in order to guide them to reading independence.

Each lesson typically focuses on a key reading skill, strategy, or behavior and consists of three

parts (Before/During/After reading), which incorporate specific teaching strategies. Before

reading the teacher introduces the texts to students using key vocabulary that students may find

challenging. During reading the teacher prompts and supports individual students for strategic

reading actions while the student is reading the text. After reading the teacher leads the group in

a discussion about the text and provides targeted teaching points by modeling and prompting use

of a key reading skill, strategy, or behavior. Throughout the lesson, the teacher continually

focuses on the specific needs of the small group (Fountas & Pinnell, 2001).

Despite its pervasive use in schools across the U.S., the research base surrounding the

guided reading approach is limited. Yet, research indicates that when used as intended and as a

component of a balanced literacy program, guided reading is effective in supporting students'

independent use of strategic reading actions (Young, 2018; Fountas & Pinnell, n.d.; Montero,

Newmaster, & Ledger, 2014). Young (2018) found that guided reading was more effective than

a balanced literacy approach alone in supporting second grade students' independent reading

levels, attributing the positive results to increased rigor and instructional time that a guided

reading approach provides. Montero et al. (2014) found that a guided reading approach

significantly supported English print literacy development of adolescent English Language

Learners who had received little previous experience with literacy instruction, resulting in an

average gain of eight reading levels over a six-month period. Another study conducted with at-

risk second graders found that guided reading supported the development of word reading skills

(Denton et al., 2014). Similarly, Nayak and Sylva (2013) conducted an experimental study in

Hong Kong evaluating guided reading as a supplemental English reading intervention. The

children were randomly assigned to a guided reading intervention, an intervention that used e-

books with no teacher-led instruction, or a no treatment control group (Nayak & Sylva, 2013).

These authors found that the children in the guided reading intervention made the most

significant growth in reading comprehension and reading accuracy; at the same time, there were

no significant differences in student growth between the guided reading and e-book interventions

(Nayak & Sylva, 2013).

Studies on guided reading also indicate that effectiveness is dependent upon teachers'

understanding of the purpose of guided reading and their implementation of the guided reading

approach. Ford and Opitz (2008) surveyed 1,500 teachers who indicated they were

knowledgeable about guided reading instruction. The results indicated uneven application of

guided reading in instruction, including the purposes for conducting guided reading in

classrooms, how teachers group students for instruction, and the emphasis of instruction that

occurs during guided reading (Ford & Opitz, 2008). Others have also found that implementation

of guided reading varies widely within classrooms from a focus on isolated skills to a more

critical look at texts from multiple perspectives (Fisher, 2008; Fletcher, Greenwood, Grimely,

Parkhill, & Davis, 2012; Wall, 2014). These varied approaches may lead to inconsistent results

of guided reading in individual classrooms and schools, indicating the need for ongoing support

and discussion regarding guided reading implementation in schools today (Denton et al., 2014).

Technology use during guided reading. Few studies have been conducted to

investigate the use of digital devices within guided reading instruction. One research study

investigated the use of Nearpod, an app for the iPad that allows users to create interactive

presentations with videos, polls, slides, and quizzes, in a fourth-grade guided reading group

lesson (Delacruz, 2014). The students in the study connected to a teacher-designed presentation

of a text that utilized the device's drawing tool, quizzes, and polls during the guided reading

lesson (Delacruz, 2014). Results of the study showed that Nearpod was a valuable tool because

students found the interactivity engaging and the teacher found it easy to monitor student

comprehension throughout the lesson (Delacruz, 2014). Another study investigated the impact

of Internet Guided Reading on second-grade students' ability to locate and evaluate information

on the Internet (Salyer, 2015). Using an approach similar to guided reading, the author found

that students became more skilled, strategic online readers who were better able to ask questions,

use search engines, read and evaluate search results, preview texts in different modes, predict

information in websites, and synthesize information across sources (Salyer, 2015).

What is the connection between guided reading, online research, and comprehension

skills? First and foremost, the complexity of skills involved in online research requires readers

to engage in strategic actions to effectively interact with the text. Within the guided reading

framework, Fountas and Pinnell (2012) provide a system of strategic actions that depicts how

readers process traditional texts as they think within, beyond, and about the text they are reading.

More traditional reading processes like word solving, fluency, and self-monitoring strategies are

addressed when thinking within the text. Thinking beyond the text and about the text address

critical thinking skills, such as making predictions, making connections, synthesizing

information across texts, inferring, analyzing, and critiquing the text. Teachers use this system

of strategic processes to assess students' use of these strategies within traditional texts through

close observation of students' reading behaviors, discussions about the text, and writing about

the text (Fountas & Pinnell, 2012).

To a degree, the thinking processes represented in the system of strategic actions mirror

the strategic thinking also required by online inquiries (Fountas & Pinnell, 2012). However,

strategic actions required for online research and comprehension are extended to account for the

unique, complex reading environment of the Internet. For example, when searching for

information in a traditional text, one is limited to the relevant information presented in the article

or book. Alternatively, when searching for information on the Internet, one has to sift through

numerous sources and countless search results to find, analyze, evaluate, and synthesize relevant

information.

The design of the guided reading framework lends itself to guiding and supporting

students' use of strategic actions, whether in traditional printed text or through newer modes of

text on the Internet (Fountas & Pinnell, 2012). Explicit modeling and strategic prompting

provided by the teacher through the guided reading framework are essential elements of teaching

online research and comprehension skills (Leu et al., 2008). However, there are many key

differences between traditional reading and online research that will reflect differences in the

structure of a guided reading lesson when used to teach students online research and

comprehension skills. Considering that strategic actions apply to reading comprehension of both

traditional and digital literacies, we utilized the design of the guided reading framework to frame

our thinking when designing a supportive learning environment for teaching online research and

comprehension skills through explicit modeling and strategic prompting.

Online Research and Reading Skills

In addition to the five processing practices required for effective online research

previously noted in lowercase new literacies theory, online research and comprehension skills

are affected by a student's disposition, or attitudes and beliefs, towards online reading (Coiro,

2012; Harrison, 2018; O'Byrne & McVerry, 2009; Wigfield, Guthrie, Tonks, & Perencevich,

2004). In particular, reflection, persistence, and collaboration have been identified as the three

most significant dispositions required by online research (Castek & Dwyer, 2018; O'Byrne &

McVerry, 2009). When searching for information on the Internet, online readers have to reflect

on their current strategies often and try new approaches when they are unable to find relevant,

reliable, and valid information (Coiro, 2011). In addition, online readers may have to search

multiple key words and phrases to find answers to their questions and sort through a multitude of

information to locate and evaluate information in relation to their question or problem. This

requires a great deal of persistence. Finally, collaboration with others in real-time and online

spaces is an essential skill for sharing new strategies for online research and discussing findings

that result from online research (Harrison, 2018). Coiro, Sekeres, Castek, and Guzniczack

(2014) found that in upper elementary grades students who effectively engaged with others

cognitively and socially during a structured online inquiry demonstrated deeper understanding of

the content, made stronger connections between texts and prior knowledge, and provided strong

rationales in response to question prompts than students with less effective collaborations.

Instructional Approaches

Although many practical strategies have been proposed to guide students in applying

strategies when engaging in online research and reading skills, two instructional approaches have

been found effective: (a) a think-aloud process (Coiro, 2011) and (b) Internet Reciprocal

Teaching (IRT) (Castek, 2013; Leu et al., 2008). Both of these instructional approaches

complement each other and were used within the design of the Online Guided Reading

Framework (Van Allen, 2016).

Coiro (2011) has recommended a think-aloud process consisting of modeling, guided

practice, and reflection. To effectively design a think-aloud lesson, the teacher should

"anticipate what students will struggle with most as they approach, navigate, monitor, and

respond to the online text; and offer think-aloud models of the thinking and (viewing) strategies

one would use to scaffold their understanding in these areas" (Coiro, 2011, p. 111). Within a

lesson, teachers should model their thinking, prompt students in guided and collaborative

practice of the skill or strategy, and engage students in reflection on using the skill or strategy.

Ebner and Ehri (2013) examined how the use of a structured think-aloud procedure supported

students' learning of new vocabulary on the Internet and found that students were more likely to

stay on task and engage in metacognitive thinking about their Internet usage and vocabulary

learning goals. Coiro (2011) also reported that frequent and repeated use of the think-aloud

process helped students develop discourse specific language, which allowed them to recognize,

label, and discuss the particular thinking strategies they used for online reading purposes.

Another instructional approach to teaching online research and reading skills that has

been validated in research is Internet Reciprocal Teaching (IRT). Reciprocal teaching employs a

gradual release of responsibility to engage students in collaborative discussions, cultivate

metacognitive reading strategies, and results in improved reading comprehension (Palincscar &

Brown, 1984; Rosenshine & Meister, 1994). Building off of the reciprocal teaching approach,

IRT emphasizes the online reading strategies of questioning, locating, critically evaluating,

synthesizing, and communicating to develop students' online research and comprehension skills

(Leu et al., 2008). Salyer (2005) found this approach effective in the implementation of Internet

guided reading lessons with second graders. Another study conducted with middle school

students discovered that IRT resulted in immediate use of strategies to locate and evaluate online

information (Colwell, Hunt-Barron, & Reinking, 2013). However, one challenge noted in this

study was the students' failure to transfer these strategies to subsequent academic or personal

Internet search tasks, indicating the need for ongoing support and guidance in these strategies to

increase transfer (Colwell et al., 2013).

The Online Guided Reading Framework

The following proposed Online Guided Reading Framework (Van Allen, 2016) (see

Figure 1) provides a flexible structure for teaching students in upper elementary school grades

strategies specific to online research and comprehension skills. The modifications reflect and

integrate the nature of online research and comprehension into the structure of a traditional

guided reading lesson, while integrating think-alouds and components of the IRT approach. A

full description of the framework follows with explicit examples from a fourth grade lesson on

understanding the structure of a search engine results page and another fifth grade lesson on

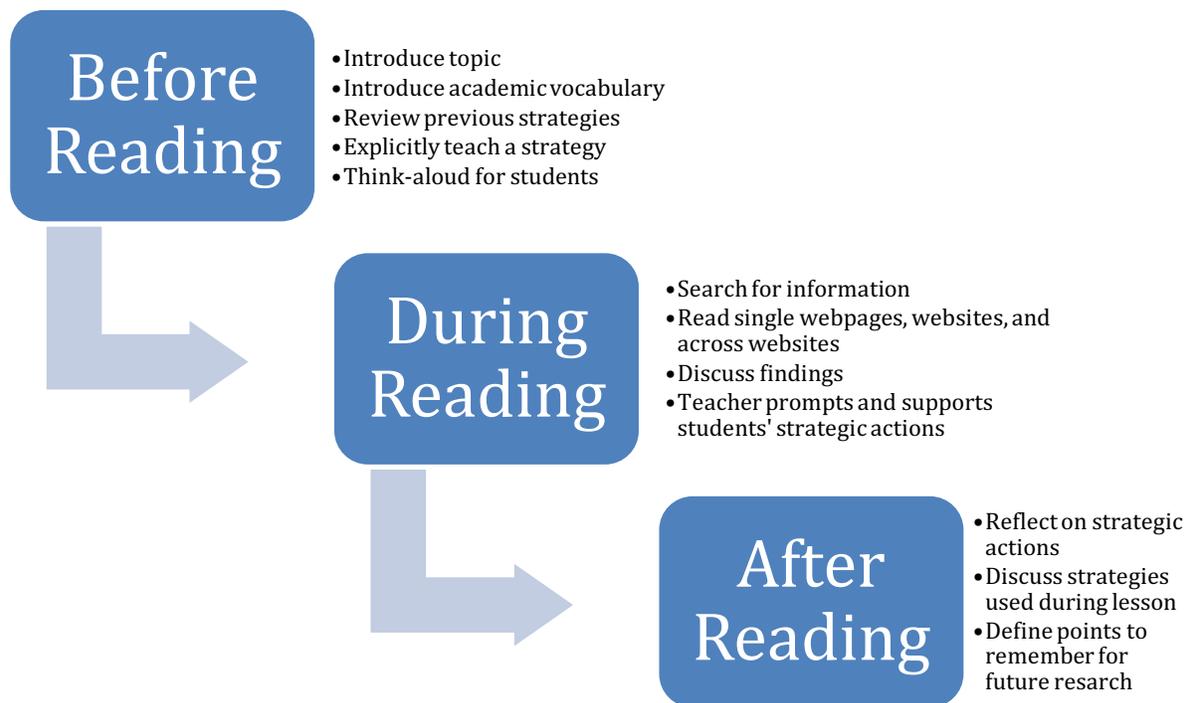determining the credibility of information on a website.

Before Reading
- Introduce topic
- Introduce academic vocabulary
- Review previous strategies
- Explicitly teach a strategy
- Think-aloud for students

During Reading
- Search for information
- Read single webpages, websites, and across websites
- Discuss findings
- Teacher prompts and supports students' strategic actions

After Reading
- Reflect on strategic actions
- Discuss strategies used during lesson
- Define points to remember for future resarch

Figure 1. Online Guided Reading Framework

Teacher Preparation Before the Lessons

Grouping students. Some teachers may choose to conduct Online Guided Reading lessons with the small groups that have already been formed in their classrooms. However, other teachers may choose to first observe students' skills with online reading and research and group students based on their proficiency with the five previously discussed strategic actions for online research and reading. Leu et al. (2008) developed the Teaching Internet and Comprehension to Adolescents (TICA) checklist as part of a larger project that designed assessments for online research and comprehension skills. While addressing the five processing practices necessary for online research, the TICA checklist delineates sub-skills required by online readers. More specifically, the TICA checklist articulates foundational computers skills and explicit strategic

actions necessary for each processing practice. In addition, these sub-skills are categorized into

phases that progress from simpler to more complex skills (Leu et al., 2008). Teachers may find

the TICA checklist to be a helpful tool as they identify student needs and form Online Guided

Reading groups. The TICA checklist may be found at http://www.orca.uconn.edu/professional-

development/understanding/tica-checklist/.

Choosing a topic. In addition to forming groups, teachers should choose a common

topic or concept, rather than common text, to interact with during the lesson. Traditional static

texts are more likely to be read page by page in a logical order determined by the author;

whereas, Internet readers take a self-directed reading path as they navigate through a series of

texts that relate to their topic (Afflerbach & Cho, 2010). During the lesson, students will visit

varied Internet sources based around this common topic (Van Allen, 2016).

Choosing a topic that builds on content being studied in other subject areas is a beneficial

way to develop and extend student knowledge of the topic. Topics may also develop from

inquiries that are being conducted in other content areas or from student interests. For example,

a teacher may chose an inquiry topic related to an upcoming social studies unit in order to

provide her students with background knowledge. Alternatively, as students become more

proficient with generating questions for research through the Online Guided Reading

Framework, teachers may scaffold the process by having students generate their own questions

or problems to research during these lessons.

Before Reading

Introduction. In an Online Guided Reading lesson, teachers may begin the first lesson

of an inquiry by providing students with a brief overview about the topic or concept to be

researched. Introducing students to unfamiliar, but integral key academic vocabulary and

relevant background knowledge is crucial. Introductions to subsequent Online Guided Reading

lessons within the same inquiry may review previous findings or previous online strategies

students will use in the current lesson. As an example, a teacher may guide students to notice

and note the key features of a search results page using appropriate academic vocabulary (ex.

title, snippet, URL, sponsored link). Before beginning the next lesson, the teacher would prompt

students to identify these features and their purposes during the introduction to the Online

Guided Reading lesson (Van Allen, 2016).

Targeted teaching points. A typical guided reading lesson structure prompts teachers to

provide targeted teaching points after students have read the text (Fountas & Pinnell, 2001).

However, the Online Guided Reading Framework (Van Allen, 2016) prompts teachers to provide

these targeted teaching points at the beginning of the lesson. These targeted teaching points

should support online readers in using one of the five strategies previously noted for online

research and comprehension (Leu et al., 2008). This is an essential piece of the lesson because it

provides time for the teacher to build shared academic language among the group.

Think-alouds. Teachers may use think-alouds and modeling to provide these targeted

teaching points. Coiro (2011) recommends the use of think-alouds when teaching online

research and comprehension skills to explicitly model strategies, provide students with academic

language, and promote metacognitive thinking about strategy use to improve students'

comprehension of Internet texts. In a lesson on understanding key features of a search results

page, teachers may direct students' attention to advertising links versus other links using the

think-aloud in Table 1. The think-aloud during a lesson on determining credibility of a website

may focus students' attention on questioning information that doesn't make sense (see Table 1).

Table 1: *Think-aloud Examples*

Lesson	Think-aloud
Identifying advertising links	Here I notice that these links look a bit different from the rest. I notice that these links have the word "ad" near them. These links are known as advertising links or sponsored links. Advertising or sponsored links are like advertisements on television. Companies paid to put these ads on search result pages to advertise their company or product. Often these links do not bring me to any useful information because they are trying to get me buy something or sign up for something, so I usually skip over them. Sometimes these types of links will have the word "ad" by them and other times these types of links will have the word "sponsored" by them.
Questioning information	I was doing a bit of research on the explorer Christopher Columbus and came across a website titled *All About Explorers* (https://www.allaboutexplorers.com/explorers/columbus/). As I was reading through the information about Christopher Columbus, I got confused. The website said that Christopher Columbus started sailing west with three ships in 1942. That didn't make sense to me because I know that my grandma was alive in 1942. It also stated that Christopher Columbus got the idea to go west from infomercials. I thought to myself, "What??? They had infomercials back then?" So, I decided to cross-check the facts on this website with another website that had a biography of Christopher Columbus (http://www.history.com/topics/exploration/christopher-columbus). What I found is that the *All About Explorers* website looked credible, but was full of inaccurate facts. Always remember to cross-check information with other sources, especially when it doesn't make sense.

During Reading

        Just as with a traditional guided reading lesson, during an Online Guided Reading lesson

students interact with text while receiving prompts and supports from the teacher. However, due

to the nature of Internet texts, students will be interacting with and reading across multiple

multimodal texts such as videos, podcasts, webpages, etc. Students will use the five strategies

for online research and comprehension (although not necessarily in the same lesson): identifying

a problem or question, searching for and locating information, critically evaluating information,

synthesizing information, and communicating information (Leu et al., 2008). In addition,

students in the group will interact with different texts at the same time.

Teacher prompting. Frequent, immediate feedback greatly improves students' reading

skills (Fountas & Pinnell, 2011). Therefore, the teachers' role during this portion of the lesson is

to prompt and support individual students by modeling, guiding, or confirming their strategic

actions. For example, during the lesson on understanding a search results page, teachers may use

the suggested prompts identified in Table 2 to support students' strategic actions.

Table 2: *Suggested Prompts for Understanding A Search Results Page*

Model	Guide	Confirm
• Notice the title (point), snippet (point), and URL (point) for this search result. • Here I notice the word "ad" in front of this result. Remember that this means the link is an advertisement.	• Think about the symbol that differentiates an "ad" from a regular search result. • Where can you find the snippet that gives you information about the website? • Where can you find the website address or URL for the search result?	• You were able to identify which links were advertisement and those that were not. • You previewed the search result by reading the title and the snippet.

Another lesson on determining credibility may include use of the suggested prompts identified

in Table 3.

Discussion. While they are reading, students should be encouraged to engage in

discussion about the strategies they are using and their findings. For example, students should

be invited to constantly share what they are finding about the topic and help others navigate

through the Internet sources (Van Allen, 2016). Coiro et al. (2014) found that when students in

upper elementary grades discussed their strategies for inferring, integrating, evaluating, and

interpreting information during online research their work was much more productive and

resulted in increased student learning. Therefore, fluid discussion and collaboration among

students is integral to an Online Guided Reading lesson.

Table 3: *Suggested Prompts for Determining Credibility of a Website*

Model	Guide	Confirm
• Notice any information that doesn't make sense. • I thought you just read another site that said . . ., does this information make sense with that? • Look for the author of the website and determine if the author is a trustworthy source. • Remember to cross-check the information with another trustworthy source.	• Does the information seem as though it makes sense? • Where else can you look to cross-check this information? • Is the information on this site accurate? Who is the author? • Is it clear that the author is an expert on the topic? Is it clear that the author is a trustworthy source?	• You identified information that didn't make sense on the webpage. • You found a reliable source to cross-check information between two websites. • You noticed that the author didn't seem trustworthy and used that as a clue to cross-check information.

To prompt discussion during the lesson on understanding a search results page, teachers

may invite students to notice, describe, and discuss the purpose of features on their search results

page with others. Discussion during a lesson on determining the credibility of a website may be

prompted by inviting students to share specific examples and instances when they decided to

cross-check information. Teachers may request that students explain why they decided to cross-check information indicating the particular clues led them to this decision. In addition, teachers may ask students to describe the steps they took to cross-check the information.

Throughout the during reading portion of the lesson, the teacher and students will move flexibly between reading, discussing, and teacher prompting as students engage in the strategies required for online research. The role of the teacher shifts from an active guide leading a structured lesson to a more responsive facilitator guiding, prompting, and supporting students throughout the lesson (Van Allen, 2016). Consequently, the role of the student also shifts as they take active ownership of their learning from somewhat responsive learners with limited control of the lesson to more dynamic learners with an increased emphasis on collaboration (Van Allen, 2016).

After Reading

During the final portion of the Online Guided Reading Framework (Van Allen, 2016), teachers should prompt students to reflect on their strategic actions after reading. The after reading portion of the lesson leads students to discuss the strategies they used throughout the lesson and concludes with one to three take-aways.

Reflective discussion. Research from Coiro (2011) indicates that skilled online readers often reflect on their online research strategies by "summing up key ideas, making connections, looking deeper, asking questions, and contributing their own ideas in response to the posed challenge" (p. 109). Reflection helps students communicate their thoughts and findings to others (Leu et al., 2008). Additionally, reflection develops metacognitive thinking skills imperative for online research. According to Pintrich (2002), "metacognitive knowledge includes knowledge of

general strategies that might be used for different tasks, knowledge of the conditions under

which the strategies are effective, and knowledge of self" (p. 219). Online readers must not only

develop an array of strategies that they can flexibly apply when engaging in online inquiry, but

also consider when to use specific strategies most effectively and when to enact a different

strategy (Coiro & Dobler, 2007; Millis, 2016). Metacognitive thinking requires students to

engage in an interactive and ongoing process of reflection and action, requiring online readers to

continually think about their strategy use as they also engage in the five processing practices

(Coiro & Dobler, 2007; Millis, 2016). In a study conducted with adolescents who were

searching for information, Bowler (2010) found that students actively sought reflective

discussions with others to clarify thinking throughout their inquiry.

In order to prompt reflective discussion, teachers should require students to use specific

academic language previously introduced during the targeted teaching points and/or previous

lessons. To invite reflection during the understanding search engine results lesson, teachers may

ask students "What feature did you find most useful on the search results page? Why?" In

addition, the teacher should guide students to specific points to remember. For example, in this

lesson some key points to remember may be names of key features and how to tell the difference

between an advertisement or sponsored link and those that are not. Therefore, teachers may

require students to identify features of a search results page by name during the discussion.

When leading a reflective discussion on the determining the credibility of a website

lesson, teachers may ask students, "What clues prompted you to cross-check information?" and

"How did you differentiate between trustworthy sources and less credible sources?" During the

discussion, teachers may lead students to identify key points that identify specific instances when

one should cross-check information from a website, such as when the information doesn't make

sense, when a website doesn't look or work like a typical website, or when the author is

unknown. These key points should come directly from student experiences during the lessons

and may be recorded on an anchor chart to be revisited in future lessons.

Discussion

In this paper, we first introduced Online Guided Reading (Van Allen, 2016) as a context

for developing upper elementary students' online research and comprehension skills. Second,

we presented an argument for using the Online Guided Reading Framework in connection to the

already familiar guided reading instructional context. Third, we presented specific instructional

scenarios that described in detail the decisions and actions teachers can take to engage students

in reading online and teaching them how to read and comprehend digital texts found on the

Internet. It is important to remember that the Online Guided Reading Framework is intended for

use in upper elementary classrooms with students (ages 9-12) who have previously developed

sufficient decoding, fluency, and comprehension skills with print texts to be able to then to

navigate more complex texts, such as those found on the Internet. Research has shown that

reading digital texts and researching in digital contexts, require additional reading,

comprehension, and metacognitive skills (e.g., Coiro, 2011; Coiro & Dobler, 2007). Students

with reading difficulties will require additional instructional supports to support their reading,

comprehension, and research skills.

Accommodations for Students with Reading Difficulties

Depending on how students will be grouped for instructional purposes, students within

each group may have varied reading abilities. Given that the instruction will be solely focused

on Internet research and online reading comprehension skills, further support may be needed for

readers who have difficulties with accessing the text. Although the framework implies that

readers will need to have a sufficient level of metacognitive skills and reader independence

before they can navigate digital texts on the Internet, those whose reading skills are one to a few

grades below level may need to use assistive technology tools. For example, text-to-speech

software reads digital text aloud easing challenges for students who struggle to decode text

fluently and has been found to positively affect reading comprehension for students with

disabilities (Wood, Moxley, Tighe, & Wagner, 2017). Annotation software allows users to

highlight and make notes on digital texts mitigating challenges for students who struggle with

comprehension skills and vocabulary deficiencies (Chen & Yen, 2013). Translation software

may be useful for English Language Learners who are proficient readers in their native language.

In addition, Google Chrome has many extensions and apps available that dynamically level text

passages, allow students to quickly look up unknown words or check spelling of keywords, and

more (Martin, n.d.).

Other Considerations

In addition, the Online Guided Reading Framework (Van Allen, 2016) is not intended to

replace traditional guided reading groups in upper elementary classrooms. Rather, teachers

could strategically use the Online Guided Reading Framework to develop digital literacy skills

that complement class, group, and individual projects. As teachers guide students through

content area inquiries, they may notice students or particular groups of students struggling to

locate information, identify reliable information, understand information on websites, analyze

information from videos or Infographics, etc. Rather than devoting time out of limited content

area instruction, they may choose to shift the focus of their small group reading instruction to support these skills that are also addressed in literacy standards. The framework could also be applied to lessons on finding specific, targeted information within print-based texts, rather than reading the whole print-based text for general understanding.

Classroom Lesson in Focus

The excerpts from a lesson in focus provided in Table 4 show how one fourth-grade teacher utilized her guided reading groups to preview content from an upcoming social studies unit. This lesson was implemented with a group of six high performing students reading above their grade instructional level (two Black students, two Hispanic students, one White student, and one Asian student) in a low-income school. While the participating students had not previously conducted online inquiries in this classroom, they were familiar with the technology because they often used classroom laptops to take assessments and engage with school-mandated instructional programs. In addition, the teacher utilized the guided reading framework as the main format of small group instruction daily, so both the teachers and students were familiar with the structure of the lesson. This example was taken from a lesson implemented during the first inquiry unit in which the teacher explicitly taught online research and comprehension skills to this group of students.

The teacher decided to have students conduct an inquiry that explored the early history of Florida since the subject was more complex than others they had been studying (Van Allen, 2016) and resulted in an inquiry to answer the essential questions "Which countries have controlled Florida?" and "How did their control or actions affect others?" (Van Allen, 2016). Prior to this lesson in focus, the group had learned about different text features of webpages and

how these features could guide a reader to find information quickly. In this lesson, the teacher

was focusing on hyperlinks and how hyperlinks could be helpful in diving deeper into an inquiry,

but may also distract a reader from their focus questions.

Table 4: *A Classroom Lesson in Focus*

Steps	Teacher Actions	Student Actions
Introduction	Reminded students of key features of a webpage the group previously identified to help a reader navigate through a webpage.	
		Students identified the menu, search bar, and headings on a Wikipedia page.
	Pulled up a Wikipedia webpage and had students identify the features by name.	
Teaching Points	Asked students to notice the words that were different from the others	
		A student called others' attention to the blue words that were underlined
	Identified words written in blue and underlined as hyperlinks. Asked students, "What does it mean?	
		One student noted "They take you to another place that has information about the words."
	Identified a hyperlink in the text on the Wikipedia page – Spain. Prompted students to determine what information the hyperlink would provide.	
		A student exclaimed "Oh! It will take us to another webpage and we will be able to see what it talks

		about for Spain or for Great Britain or whatever it says."
	Told students to continue to search for answers to their question "Which countries have controlled Florida?" using hyperlinks to find more specific information.	
Teacher Prompting		Students began searching using key words written on a chart from a previous lesson.
	Noticed that a student was clicking through many hyperlinks and had lost focus in his search. Asked student, "What's your question? What are you looking for?"	
	Continued to prompt, "Does this site give you any information about it?"	Student repeated back the question.
		Student said no and explained how he followed a lot of hyperlinks and got lost.
	Reminded student to keep the question in mind when reading because it's easy to get in trouble with hyperlinks. Directed student to restart his search.	
Discussion		A student said, "Check this out! I didn't know Cuba controlled Florida. Another student across the table said, "That doesn't make sense."
	Prompted, "Why doesn't it make sense?	
		Student responded, "I'm looking at this timeline on the Florida Wikipedia page and Cuba isn't on there." Shared the webpage with the student who initially commented on Cuba.

		A different student recommended, "Why don't you do another search on Cuba's history to check that timeline?"
		The student searched for Cuba and read through a couple of pages. A few minutes later she responded, "Oh, I see. Spain traded Florida to Great Britain for Cuba."
Reflection	Brought the group back together to discuss strategies they used during their searches.	
		Students discussed what they learned to answer their inquiry questions and made notes in their notebooks.
		Students shared how they used hyperlinks.
	Noted that a couple of students got lost when they were following hyperlinks. Explained, "We just keep clicking to learn about things, but it's not what we need to focus on."	
		One student explained that he followed too many hyperlinks and got off task.
	Reminded students to always keep their question in their mind.	

While this particular teacher did not incorporate traditional texts within this inquiry unit,

there was potential to guide students through printed texts as well. For example, the teacher

could have helped students develop prior knowledge of the topic while conducting a traditional

guided reading lesson using leveled printed texts. Using leveled texts specifically focused on

Florida's early history as an introduction to the inquiry unit would have helped students

understand key knowledge of the topic they could use to develop more efficient search terms and

verify accuracy of the information they found in the Internet texts. Incorporating Online Guided

Reading lessons with traditional guided reading lessons during an inquiry guides students to

understand that information can come from a wide variety of sources and allows them to flexibly

develop key reading strategies for comprehending different modes of text.

Conclusions and Recommendations

Digital literacy skills are essential "for successful civic participation in a global

environment" (International Reading Association, 2009, p. 1). Many literacy and educational

organizations continue to state the need to prepare students with sufficient digital literacy skills

in researching, managing, and processing information from multiple sources, and communicating

findings effectively in a variety of formats (International Reading Association, 2009;

Organisation for Economic Co-operation and Development (OECD), 2018; Partnership for 21st

Century Skills, n.d.). Research and classroom practice warrant an instructional framework that

facilitates the development of the skills students will need to read, critically evaluate, and

comprehend digital texts and information. Adapted from a powerful, widely used framework,

the Online Guided Reading Framework (Van Allen, 2016) provides students with the supports

they need to successfully navigate the complexities of online research and comprehension,

making it a complementary instructional approach to address these skills in upper elementary

classrooms. The Online Guided Reading Framework (Van Allen, 2016) provides instructional

guidance related to supporting the development of upper elementary school students' key digital

literacy skills required for online research. Teachers from across the world can adopt and adapt

this framework to meet digital literacy initiatives and educational standards. The framework

utilizes internationally-recognized issues and demands related to teaching and supporting

students' digital literacy needs in upper elementary grades.

In addition to the Online Guided Reading Framework (Van Allen, 2016), teachers need to

be provided with professional development on how to integrate technology in new and

meaningful ways within their current curriculum. According to the 2017 *Technology Counts*

report (Education Week, 2017), although mobile learning devices, technology, and high-speed

connectivity are more present in schools today, there are digital disparities making the

achievement gap greater (Harold, 2017; Morrell, 2017). A major reason for this gap is the lack

of teacher preparation and professional knowledge in knowing how to navigate digital

environments and integrate technology in powerful ways within their curriculum (Harold, 2017).

Teacher preparation and curriculum design are areas of need for closing the digital divide and

best preparing students to be literate in the 21st century.

Future Research

While research on developing students' knowledge of online research and comprehension

skills continues to develop within the field, little research has been conducted on guided reading

and digital literacies. How does a guided reading context impact student learning of digital

literacy skills? Additionally, since the emphasis of guided reading is developing strategic

actions, more research is needed to understand the metacognitive skills required for online

research and reading. Furthermore, formative and summative assessments of digital literacy

skills are greatly needed if work in this area is to continue. How can teachers assess and monitor

students' strategic use of online research and comprehension skills to inform instruction?

Where, when, and how can teachers support the development of elementary age students' digital

literacy skills?

Despite challenges that teachers, schools, and school districts in the United States and

abroad face regarding technology access and integration efforts, teachers in upper elementary

classrooms can implement research-based principles about modeling and scaffolding students'

online research and comprehension skills that are vital to their academic learning, career

preparedness, and civic engagement.

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