Concepts of Online Text: Examining Online Literacy Skills of Elementary Students

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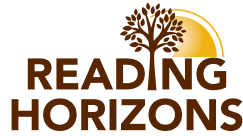Follow this and additional works at: https://scholarworks.wmich.edu/reading_horizons

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──────── **Abstract** ────────

Reading online text presents unique challenges for elementary students as they develop and extend fundamental literacy skills to various media. Traditional assessments of concepts about print inspired the authors' research, which applies a similar approach to address "screen handling" instead of book handling. The purpose of their ongoing research has been to develop an instrument to assess concepts related to online reading. The Concepts of Online Text (COT) assessment measures knowledge of online navigation and text features. Quantitative analysis of student performance data using the COT has the potential to provide developmental insight into elementary students' proficiencies in conducting internet research and to provide input to teachers for targeted instruction. In this article, the authors share results from administering the instrument to 80 elementary students in first through fifth grades.

Keywords: online reading, online text features, assessment, concepts about print

According to the Common Core State Standards (Common Core State Standards Initiative; CCSSI; 2010), students must know and use various text features to locate key facts or information efficiently. Yet text features differ in online environments, presenting potential challenges to readers attempting to apply conventional literacy skills to web-based text and media. Many of the traditional concepts about print-based text remain consistent in web-based formats. The nature of a letter, a word, or a sentence has not changed in digital environments. However, other features of online text and media require skills that are not traditionally part of literacy instruction for young readers. For example, online text features such as menus and hyperlinks offer dynamic text navigation options not available in traditional print format. Many students do not understand how to use these web-specific features and need explicit instruction in order to become proficient in these skills (Coiro, 2005; Leu, Forzani, Timbrell, & Maykel, 2015). Therefore, applying only conventional reading strategies to online information texts can present new challenges or confusion for elementary students.

Knowledge about the way print works in books is referred to as print awareness or concepts about print. In 1979, Marie Clay developed the well-known Concepts About Print (CAP) observation survey to determine knowledge emerging readers demonstrated about book handling and text-based print. Clay's assessment provides insight into young children's interactions with traditional paper-based books as they complete tasks related to text features, orientation, and directionality. Although assessment of traditional literacy tasks remains important, in the 21st century literacy skills have evolved to include traditional literacies, digital literacies, and transliteracies, which focus on how to know and learn information in the digital age as a means to be literate. Transliteracy, defined as the ability to read, write, and interact across a range of platforms, tools, and media, reflects the transformational nature of literacy (Lenhart, Brueck, Oviatt, & Houser, 2014; Vacca et al., 2018). The intent of our research was to extend beyond traditional concepts of print to evaluate elementary-age readers' skills in an online, hypermedia environment. These complex web literacy skills represent knowledge necessary for reading, writing, and participating in online environments (Leu et al., 2015; Mozilla, 2014; November, 2008). We examined children's understanding of these skills with a focus on online text features and web navigation through observational surveys inspired by Clay's work. This research is important because the internet is "this generation's defining technology for literacy and learning within our global community" (Leu, Kinzer, Coiro, Castek, & Henry, 2013, p. 1158).

Theoretical Framework

Educators continue to administer various forms of the CAP, but even Clay (2000) suggests the "rules of the road" (p. 24) are expanding and becoming more complex. These complexities relate to the multiliteracies required of internet reading. Multiliteracies, or multimodal literacies, involve visual and audio modes of communication presented through print, photos, videos, or graphs (Kress, 2010; New London Group, 1996). Reading online requires navigating a hypermedia, three-dimensional platform by clicking on images and words that connect to additional pages that can lead readers "into greater understanding, or into greater distraction" (Warlick, 2009, p. 22). The dimensions of multimodal, networked information environments expand the ways readers acquire information and comprehend ideas. Therefore, our focus on the concepts of online text is grounded in a multiliteracies perspective.

Additionally, this work is grounded in a developmental perspective. Young children enter school with varying understandings about the traditional or online conventions used to communicate meaning in text. They develop and use concepts and categories to make sense of their environment (Piaget & Inhelder, 1972). Developmental perspectives support teachers' understanding of what is appropriate to expect in terms of developmental ranges for literacy acquisition. There is little research to determine a possible developmental progression of literacy skills for online texts; therefore, the interview protocol used in this research examines children's development of literacy skills as applied to online text and media.

Background

A website provides a wide range of activities not available in the print-based counterpart, the book. In examining children's use of the internet, a National Center for Education Statistics (NCES) study of students in prekindergarten through fifth grade found that the most prominent uses of the internet for 5- to 9-year-olds were games (20.5%), homework (11.7%), and email/instant messaging (11.1%) (DeBell & Chapman, 2003). In a more recent study with children in kindergarten through second grade, over 84% reported

that they used the internet at home, the library, or both locations, and 62% stated that they used the internet at school (Dodge, Husain, & Duke, 2011). In terms of internet use, the most common response from young children was that they used it for games. Less than one-fourth of children viewed the internet as a place for information or communication (Dodge et al., 2011). In addition, a survey conducted of 9- to 16-year-olds in 25 countries indicated top activities for children and youth using the internet included schoolwork (92%), playing games (83%), watching video clips (75%), and participating in social networking (71%; Livingstone, Haddon, Görzig, & Ólafsson, 2011). Exposure to books at a young age is typically associated with the development of concepts about print. However, because young children's primary use of the internet may not be reading, it is not clear whether exposure to the internet or websites alone might promote the development of concepts of online text.

Traditional assessments of print concepts align with offline reading skills. The assessment used in this study specifically focuses on concepts of online text. While Clay's (1979) CAP provides insights into young children's understanding of book handling and alphabetic text, the Concepts of Online Text (COT) provides insight into elementary students' understanding of screen handling, the dynamic nature of online print, and multimedia aspects of online navigation. Our purpose for developing the COT instrument was to understand elementary students' abilities to navigate online text and media. Drawing foundationally on the work of Clay and theoretically from a multiliteracy perspective, this research examines results from the administration of the COT with 80 elementary students. The guiding question for this study was: What concept knowledge of online texts do elementary students demonstrate in grades 1–5?

Concepts of Print

Assessing children's understanding, and sometimes misunderstanding, provides insight into students' print awareness and learning needs (Gillet & Temple, 2004). Clay's (1979) CAP, administered individually to young children, assesses early literacy tasks such as identifying the front of a book or the direction of print. In order to assess readers' concepts about the orientation of text, the CAP prompts students with with several task prompts: *Where is the front of the book? Where is the back of the book? Open the book to where the story begins.* Knowledge about directionality is addressed with tasks like *Show me where to start reading* and *Where do I read after this?* In order to determine whether students understand sequencing of text, students are given this prompt: *Where do I read after this?*

Emerging readers typically master print awareness and concepts of print in kindergarten (Bear, Invernizzi, Templeton, & Johnston, 2015). Parallel transfer of reading traditional texts to online reading cannot be assumed and may challenge what we consider "emergent" in online contexts. In contrast to knowledge about turning a page and reading from top to bottom, young online readers should possess navigation knowledge such as scrolling on a webpage, clicking or tapping on hyperlinks, and using directional buttons such as back arrows. This knowledge about online text and media, often referred to as digital or web literacy, enables readers to effectively navigate the three-dimensional connectedness of hypermedia environments (Warlick, 2009), but we know little about how and when readers develop these skills. Kervin and Mantei (2016) charge the research community to gather evidence about what young readers "can and cannot do when reading an online text" (p. 647). Therefore, the COT extends Clay's work to examine concepts of online text pertaining to navigation skills. Table 1 presents an overview of the concepts of printed text considered during the development of the COT, particularly concepts also present in online text, concepts that extend from print to online formats, and concepts unique to online media.

Table 1 Considerations for Concepts of Online Text Assessment Based on Concepts About Print Assessment

Clay's (1979) Concepts About Print Assessment		Concepts of Online Text Assessment
Concepts of Print-Based Text	Reader Prompts	Considerations for COT Assessment Development
Orientation or layout of text/front of book	Where is the front of the book?	What parts of a website does a student need to know?
	Where is the back of the book?	The URL leads to the "book"/site. Do students know this term? Know its purpose?
	Open the book to where the story begins.	Consider layout of a website: similarities to and differences from a print-based text.
Print, not pictures, carries the message	Show me the picture.	Components of a webpage all carry meaning: print, visuals, hyperlinks, structure/organization, etc.
	Show me the words.	
Direction of print	Show me where to start reading.	Direction of print/reading is different on a webpage/website (not necessarily linear)
	Where do I read after this?	How does a reader scroll, move forward/back?
Page sequencing	Where do I read after this?	"Page" sequencing: webpages within a site (not necessarily linear)
		How does a reader "turn pages" in a nonlinear format?
		Print features particular to online text:
		• Hyperlinks (various formats and purposes: definitions, additional information, graphics, etc.)
		• Differences between websites and webpages (one hyperlink can lead to another website, taking the reader to another "book" rather than another page/chapter within the same book); can the reader differentiate?
		• Titles and headings (throughout website/ webpage)
Difference between letter and word.	Show me one letter.	This is requisite knowledge needed for reading online text.
	Show me one word.	
	Show me the first letter in a word.	
	Show me the last letter in a word.	
Return sweep	Where to I read after this?	Same skill needed for tracking online text; however, online text may require clicking on "read more" types of links to additional webpages for complete text then navigating back to original page.
One-to-one correspondence	Point to each word as I read this line.	This is requisite knowledge needed for reading online text.
Punctuation	Do you know what this is? What is this for?	This is requisite knowledge needed for reading online text.

Concepts of Graphics in Text

Others have also built on Clay's (1979) work in response to the changing nature of literacy skill demands. Nell Duke and her colleagues (2013) suggested that "in theorizing and researching concepts of print. . . literacy scholars have largely neglected the role of graphics" (p. 178). These researchers identify a set of concepts of graphics pertaining to written texts: action, extension, importance, intentionality, partiality, permanence, relevance, and representation. *Extension* suggests that some graphics provide additional information that is not present in the written text. *Importance* implies that "some information in a graphic may be more important than other information" (Duke et al., 2013, p. 180). *Intentionality* refers to authors' specific choice of visual to communicate meaning. *Partiality* means not all written text is represented graphically. *Permanence* represents the static natures of graphics in printed texts. These images do not change. *Relevance* pertains to the provided graphics and how they relate to the written text. *Representation* refers to illustrations and photographs that represent objects but do not have the same physical properties as those objects. Using these concepts, Duke et al. investigated children's actual knowledge about and concepts of graphics and concluded that the proposed concepts of graphics develop in early childhood but appear at differing rates of development depending on the concept and the child. *Action* developed by early prekindergarten and kindergarten for most participants. Acquisition of other concepts was attained during the preprimary and primary grades in a developmental progression (with increased acquisition by grade level). However, *importance* and *extension* proved to be the most difficult concepts and were only partially acquired (or not at all) by a majority of participants by the end of third grade. Some of the concepts of graphics, such as importance and extension, also apply to online text features.

Although further research was recommended in the area of graphics, we agree with the researchers that the concepts about print need expanding. Again, parallels cannot always be assumed. Online text and media differ from traditional print in that information is not static and is interconnected through links and visuals in multiple ways, thereby adding to the complexity of understanding online text (Coiro & Dobler, 2007; Warlick, 2009). Drawing from Duke and colleagues' (2013) attention to graphics, we continued an investigation into visual text features (like graphics), which are included in the CCSS (CCSSI, 2010). Text features in online reading may impact how students select a website to examine and how they determine relevance to their research topic. Duke et al.'s work informed the COT's attention to visuals, which examines the identification and understanding of webpage text features such as author, publisher, titles, headings, menus, captions, graphics, and hyperlinks.

Assessing Web Literacy Skills

In 2015, 71% of Americans ages 3 and older used the internet (National Center for Education Statistics, 2017). Such access prompts educators to consider ways online text differs from traditional text and how students approach these texts differently. Reading extends beyond static text printed on paper to include online text and media rendered to a digital screen. "It is essential, then, that we consider how to gather evidence about what an emergent reader can and cannot do when reading an online text" (Kervin & Mantei, 2016, p. 647). Recognizing this change, in the early part of this century, the Institute for Educational Sciences funded research to develop online reading comprehension assessments (ORCA) for middle school students (Leu et al., 2008). The assessment, now available for use (see University of Connecticut, n.d.), included an authentic means to assess online reading

comprehension, focusing specifically on skills related to a student's ability to locate, evaluate, synthesize, and communicate information. Even though ORCA's focus was on middle school students, many research skills necessary for location information on the internet are used and expected to be used (CCSSI, 2010) by elementary students.

Researchers continue to consider the assessment of younger students' emerging online literacy skills. The Online Reading Assessment (ORA), developed by Kervin and Mantei (2016), is a prototype assessment tool for emerging reading practices of an online reader. In order to understand what young children do (or do not) attend to when reading in the online environment, the assessment extends Clay's (1979) instrument for use in the online environment. A blog was used to examine student encounters with text features; orientation to the text; structural concepts; directionality; letters, words, and punctuation; and reader as author. After administering the assessment to 150 5- to 7-year-olds, Kervin and Mantei found the following:

> 1) There was a direct connection between the concepts that were under a reader's control and those yet to be mastered in the CAP assessment and the ORA. 2) When asked what they noticed about the webpage, these emerging readers predominantly identified images in their initial responses. 3) More than two-thirds of the readers were attracted to movement on the screen (e.g., the movement in the banner) but were unable to identify what the purpose of the movement might be. 4) Control of computer literacies was variable for these readers. Approximately half were able to successfully use the highlighting tool. (p. 651)

Concepts of Online Text

The COT instrument (see Appendix) development occurred during the same time period as the ORA. We took a similar approach to assessing young children but focused on the use of authentic websites. Our research involves assessing skills and tasks pertaining to online reading and webpage text features for elementary students. The dimensions of multimedia, networked information environments add to the complexity of online learning and expand the ways readers acquire information and comprehend concepts.

One goal of our research with the COT has been to understand the progression of skills related to navigating websites and understanding online text features. At what age do these skills typically develop for young readers? Like Clay (1979) and Duke et al. (2013), we conducted observations of children engaging in authentic tasks as a means of understanding the development of particular knowledge and skills.

The COT instrument consists of seven tasks and facilitates observations of children engaging in authentic tasks as a means of understanding the development of particular knowledge and skills. Some of the items refer to specific webpages to allow test administrators to assess responses and performance consistently. Data analysis resulted in the grouping of assessment items into two main constructs measured with the instrument: (1) website orientation and navigation and (2) knowledge of webpage text features (Table 2). These constructs build from and extend the work of Clay (1979) and Duke et al. (2013). For example, Clay's CAP assesses the handling of a book, whereas the COT assesses the handling, or navigation, of a screen. COT also includes intentional focus on visual text features, extending the work of Duke et al.

Table 2 Concepts of Online Text: Constructs

Constructs	Description
Website orientation and navigation	Orientation of a website, including the understanding of principles involving directional arrangement of text and media
Knowledge of webpage text features	Identification and understanding of webpage text features such as author, publisher, titles, headings, menus, captions, graphics, and hyperlinks

Not all of the COT interview tasks are reflected in Clay's (1979) CAP. For example, emerging readers are not typically asked to find a copyright date in a book. Because of the contributory nature of the internet and the eventual need to establish reliability and trustworthiness in a Web 2.0 world, identifying the features that will lead to the development of strategies to determine reliability and trustworthiness is important (November, 2008). Therefore, knowledge about a website's author, publisher, and copyright date are included on the COT and examined in this study.

Methods and Data Treatment

In the spring of 2016 and 2017, we administered the COT to 80 elementary students in a one-on-one setting. Two phases of interviews were recorded and transcribed. Three researchers worked together to score student performance and refine the instrument during development. After each phase, the researchers independently scored interviews with a 1 for successful task completion or a 0 otherwise. Test administrators also made notes about their observations and student responses. When we did not have unanimous agreement, we either came to a consensus or revised the constructs, descriptors, interview tasks, and directions for clarity. The instrument contains examples of acceptable and nonacceptable responses based on data collected in the initial phases. A fourth researcher implemented a revised version of the instrument to provide clarity on the instructions.

Participants

Participants were 80 students in first through fifth grades (Table 3) in the south central United States, selected from two Title I schools, with more than 35% of students categorized as low income. The purposeful sample included both male and female students. There is a significant commitment to technology on these campuses, so the students had frequent access to devices, such as a classroom set of iPads.

Table 3 Number of Participants per Grade Level

Grade Level	N
First	15
Second	14
Third	16
Fourth	15
Fifth	20
Total	80

Data Collection Procedures

Task administration. After gathering both guardian consent and student assent, we conducted one-on-one interviews in the school library media center. As part of establishing rapport with each student, we assured them that they were not expected to know all of the answers and that "I don't know" was an acceptable answer. In addition, both a computer and an iPad were offered for use during the interview. The laptop used during the interview had only a few icons representing browsers so that students were not distracted, and a mouse was attached to the computer so that students could choose between a mouse and the touch pad. Most students opted to use the computer. We believe this was in part due to the novelty of the computer—the first graders seemed excited to try it. Students could switch from the computer to the iPad at any time during the interview. There were no instances when a student did not know how to use a mouse, but if this would have happened, the student would have been encouraged to use an iPad. All participants completed the COT interview, which lasted 8–10 minutes.

Task validity. Our research team used several mechanisms to examine and maximize the validity of the interview tasks. First, we drew on previous observations of children conducting internet searches on computers and tablets. Second, we spent considerable time searching for a child-appropriate website that included some information text and reflected text features such as menus, visuals, ads, hyperlinks, and author information. We considered readability, layout, and appropriate interest. Third, we administered tasks one-on-one using a protocol designed for the target age range, including "kid-friendly" prompts to assist children if they had difficulty demonstrating their understanding or articulating their thoughts. Like Clay (1979), we were interested in whether students could demonstrate their skills, not necessarily verbalize them; therefore, acceptable and unacceptable answers were developed to include both verbal and nonverbal responses from students. For example, we wanted to see if children understood how hyperlinks function, not that they knew the term *hyperlink*. The final task-validity strategy was expert review, which included a recognized expert in the field as well as classroom teachers in a graduate-level literacy and technology course and a library media specialist. Classroom teachers administered the instrument for usability, specifically to ensure the instructions were clear for the administrator.

Data Analysis

Since the participant sample spans multiple grade levels, the survey responses indicate the acquisition of digital skills for students in grades 1–5. The number of correct responses on each task for each grade level was calculated, and we compared the point and interval estimates for the individual mean for each grade level. Therefore, confidence intervals for each construct provided an estimate of the population parameter. The purpose of this statistic was to compare web literacy skills of students across grade levels for each construct. To compare the data across grade levels, we chose the conventional 95% confidence interval.

<div align="center">

Results

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The primary purpose of this research was to examine student knowledge about online navigation and online text features and to examine the developmental progression for understanding and navigating online tools using COT. Through the observational survey process, we were able to evaluate the digital skills of 80 students in grades 1–5.

Construct 1: Website Orientation and Navigation

The printed page is read left to right, top to bottom, but website navigation includes the ability to navigate between sets of connected pages, connect to additional sites of connected pages, and return to the original site. The data suggest that the skills of closing a webpage and scrolling are acquired early. Out of all students interviewed, only one first grader did not know how to use the scroll bar or arrow buttons to demonstrate how to find the top of the page and the bottom of the page. Most students successfully closed a webpage as well. Three first graders, one second grader, and one third grader were unable to close a website.

The less frequently mastered skills included moving from one page to another using forward or backward arrows and understanding that a URL (Uniform Resource Locator) is the web address. Only 47% of first graders understood the use of forward and backward arrows; however, 79% of second graders, 88% of third graders, 93% of fourth graders, and 95% of fifth graders successfully demonstrated this navigation skill. This skill appears more developed in the older children. Most students viewed the URL space only as a search bar. Of the 80 students interviewed, 13% of first graders, 14% of second graders, 53% of third graders, 53% of fourth graders, and 85% of fifth graders correctly responded to the question about the URL (Table 4).

Table 4 Construct 1: Frequencies of Correct Answers

Grade	N = 80	URL	Scroll	Forward/Backward Arrows	Close Page
1st	*n* = 15	13%	93%	47%	73%
2nd	*n* = 14	14%	100%	79%	77%
3rd	*n* = 16	56%	100%	88%	100%
4th	*n* = 15	53%	100%	93%	92%
5th	*n* = 20	85%	100%	95%	100%

Figure 1 shows confidence intervals for students in grades 1–5. The possible scores for website orientation and navigation (construct 1) was 0 to 4 and was calculated from four questions on the COT. The mean student performance for each grade level lies inside the interval with 95% certainty. The older children had smaller confidence intervals, indicating the spread of data was closer to the mean.
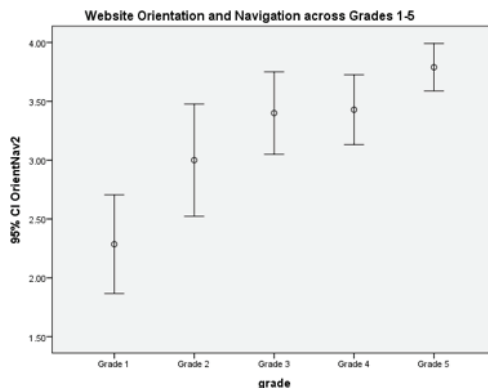

Figure 1. Confidence Intervals (Cis) for Website Orientation and Navigation

Construct 2: Knowledge of Webpage Text Features

Because many online texts are often informational, traditional nonfiction text features such as author, publisher, titles, headings, graphics, and captions are also used on webpages. Webpage text features incorporate unique structures such as menus and hyperlinks. Findings from this study indicate that questions about these unique text features, particularly hyperlinks, were challenging. Hyperlink features reflect the greatest difference because they function beyond the visible, multimodal text on a screen. Hyperlinks connect to additional information but are less consistent in usage. At times, hyperlinks may provide a definition or sound options, while at other times, hyperlinks may take the reader to additional information, such as videos, graphics, and other websites. Out of all students interviewed, only 22% understood the function of hyperlinks.

It was also noted that some more traditional features, such as publisher and copyright, were challenging for elementary students until fifth grade. At the fourth-grade level, 13% and 40% could locate the publisher and the copyright date, respectively, while 55% and 60% of fifth graders could demonstrate these competencies. All text feature skills appeared more developed in the older children. Table 5 presents data reflecting the frequencies of correct answers.

Table 5 Construct 2: Frequencies of Correct Answers

Grade	N = 80	Hyperlinks	Locate Text Features	Locate Title	Locate Author	Locate Publisher	Locate Copyright
1st	n = 15	7%	43%	40%	40%	0%	0%
2nd	n = 14	0%	79%	79%	86%	7%	0%
3rd	n = 16	12%	75%	75%	100%	12%	12%
4th	n = 15	40%	80%	67%	80%	13%	40%
5th	n = 20	45%	85%	80%	85%	55%	60%

Figure 2 represents data using confidence intervals. The possible scores for the knowledge of webpage text features (construct 2) was 0 to 5 and was calculated from five questions on the COT.
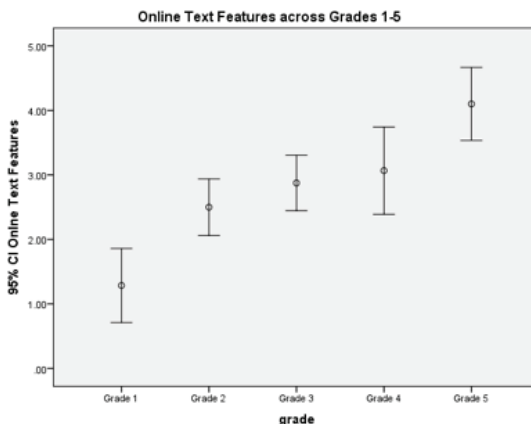

Figure 2. Confidence Intervals (Cis) for Online Text Features

Discussion and Implications

Researchers recognize that emerging readers generally master print awareness in kindergarten or early in first grade (Bear et al., 2015). Although our interview protocol will continue to undergo validation, an initial finding is that young readers do not develop web literacy skills by kindergarten, nor would we expect mastery. According to our findings, like Clay's (1979) CAP and Duke et al.'s (2013) Concepts of Graphics, there appears to be a developmental trend among navigation skills for online texts. Some basic screen handling such as scrolling and opening and closing websites appear early, while other skills such as understanding hyperlinks, a distinguishing feature of online texts, are complex and misunderstood my most elementary students. We believe this is in part due to increased complexity of the tasks and the need to understand beyond what is visible on the page or site. Online reading skills do not always mimic traditional reading skills. Hyperlinks appear the most unknown text feature for students in grades 1–5, with only 45% of fifth graders accurately articulating the function. Hyperlinked text represents one way in which online text affords new opportunities not available in traditional print-based text. One difficulty may be that hypertexts often contain link labels with fewer semantic clues (Foltz, 1996; Otter & Johnson, 2000). Because many hyperlinks included one or two highlighted words, many students responded that the word was an "important" word, like a boldface word in a textbook. Some students compared the link to a dictionary, thinking they would access a definition. While this was not entirely incorrect, as some hyperlinks do function as a glossary, most students did not understand the navigation that occurs when a hyperlink connects to a new webpage.

Just as exposure to books through read-alouds promotes concepts of print (Clay, 1979), it is reasonable to suggest that exposure to online text and media promotes online navigation skills and text features. After interviewing first through fifth graders, we predict that upon a second interview, many students would know about hyperlinks because they had used them in our assessment. Internet designers promote "intuitive website design" so that "when a user sees it, they know exactly what to do" (Laja, 2018, para. 1). Participating in the COT assessment may provide such an experiential learning situation. As teachers can support the development of concepts of print by explicitly showing students the features of written language, so too can teachers use opportunities for online reading and researching to teach the skills represented in the COT. Web literacy, required for reading, writing, and participating in an online environment (Mozilla, 2014; November, 2008), is important because internet use will "increase, not decrease, the central role teachers play in orchestrating learning experiences for students as literacy instruction converges with internet technologies" (Leu et al., 2013, p. 1173).

What does this mean for educators? The CCSS incorporate online text features and search tools as early as third grade. Students are expected to use text features and search tools, such as key words, sidebars, and hyperlinks, to find information. If third graders must use the features and search tools, then awareness of and knowledge about these features should be introduced prior to third grade. More research in this area is needed to determine how and to what extent students should demonstrate these skills. In order to gain understanding of concepts about online text, students must be purposely exposed to online text.

Conclusions

The guiding question for this study was: What concept knowledge of online texts do elementary students demonstrate in grades 1–5? Findings indicate that most participants were proficient at navigating the internet using the scroll bar and navigation arrows, and they could close a webpage. Participants were also proficient with some webpage text features as well. They could identify text features including headings, authors, and titles. The most challenging concepts of online text were knowledge of the URL and navigating hyperlinks. Both navigation skills and knowledge of online text features increased as students advanced in grade levels.

Warlick (2009) reminds us that even students who seem adept in hypermedia environments of online games and social media might not be skilled at using networked information environments effectively. Just as teachers model concepts with young students using big books (Stahl, 2012) and enlarged texts, they can do the same with internet navigation on large presentation screens. For example, rather than having an image or video at the ready, teachers can model search process methods, including some typical internet missteps (Warlick, 2009) about their process starting from the search engine or opening page of a website.

Findings from this study have implications for teacher preparation and development as well. Preservice teachers' literacy education should extend to concepts of digital print. In addition, in-service teachers' continued professional development should include evolving literacy skills. Navigating online texts is a current need, not a future need. While we recognize that we live in a world that will no doubt continue to change, our classrooms and practices need to reflect literacy practices that promote fluency with both traditional texts and online, multimedia texts that students need to use in present-day contexts (U.S. Department of Education, 2017). In other words, students must be transliterate. Understanding student knowledge of digital literacy, as well as ways digital texts and media work in an online environment, provides insight into instruction needed in current elementary settings.

This work is ongoing and serves as a catalyst for continued related research. An instrument to assess students' knowledge of online text concepts will be a resource for educators to determine the skills their students possess as well as the skills they need to learn. Rather than assuming students will learn needed skills as they engage with online text, we as educators must acknowledge the need for explicit instruction and the benefit of learning through experience. Future work, therefore, should address instructional implications, a focus on needed skills for the evaluation of online resources, and the creation of credible online media.

References

Bear, D. R., Invernizzi, M., Templeton. S., & Johnston, F. (2015). *Words their way: Word Study for phonics, vocabulary, and spelling* (5th ed.). Saddle River, NJ: Pearson.

Clay, M. M. (1979). *The early detection of reading difficulties* (3rd ed.). Auckland, New Zealand: Heinemann.

Clay, M. M. (2000). *Concepts about print: What have children learned about printed language?* Auckland, New Zealand: Heinemann.

Coiro, J. (2005). Making sense of online text. *Educational Leadership, 63*(2), 30–35. Retrieved from http://www.ascd.org/publications/educational-leadership.aspx

Coiro, J., & Dobler, E. (2007). Exploring the online reading comprehension strategies used by sixth-grade skilled readers to search for and locate information on the Internet. *Reading Research Quarterly, 36*, 378–411.

Common Core State Standards Initiative. (2010). *Common core state standards for English/language arts and literacy in history/social studies, science, and technical subjects*. Retrieved from http://www.corestandards.org/assets/CCSSI_ELA%2 Standards.pdf

DeBell, M., & Chapman, C. (2003). *Computer and internet use by children and adolescents in 2001* [Statistical analysis report]. Washington DC: National Center for Education Statistics.

Dodge, A. M., Husain, N., & Duke, N. K. (2011). Connected kids? K–2 children's use and understanding of the internet. *Language Arts, 89*(2), 86–98.

Duke, N. K., Norman, R. R., Roberts, K. L., Martin, N. M., Knight, J. A., Morsink, P. M., & Calkins, S. L. (2013). Beyond concepts of print: Development of concepts of graphics in text, preK to grade 3. *Research in the Teaching of English, 48*(2), 175–203.

Foltz, P. W. (1996). Comprehension, coherence, and strategies in hypertext and linear text. In J. F. Rouet, J. J. Levonen, A. Dillon, & R. J. Spiro (Eds.), *Hypertext and cognition* (pp. 109–136). Mahwah, NJ: Lawrence Erlbaum.

Gillet, J., & Temple, C. (2004). *Understanding reading problems: Assessment and instruction* (6th ed.). Boston, MA: Allyn and Bacon.

Kervin, L., & Mantei, J. (2016). Assessing emergent readers' knowledge about online/ reading. *The Reading Teacher, 69*, 647–651. https://doi.org/10.1002/trtr.1458

Kress, G. (2010). *Multimodality: A social semiotic approach to contemporary communication*. New York, NY: Routledge

Laja, P. (2018, October 5). *Intuitive web design: How to make your website intuitive to use*. Retrieved from https://conversionxl.com/blog/intuitive-web-design-how-to-make-your-website-intuitive-to-use/

Lenhart, L. A., Brueck, J., Oviatt, P., & Houser, S. (2014, July 29). Camp Digi-Lit: Using transliteracy tools to counteract summer reading loss. *Literacy Daily*. Retrieved from https://www.literacyworldwide.org/blog/literacy-daily/2014/07/29/camp digi-lit-using-transliteracy-tools-to-counteract-summer-reading-loss

Leu, D. J., Jr., Coiro, J., Castek, J., Hartman, D. K., Henry, L. A., & Reinking, D. (2008). Research on instruction and assessment of the new literacies of online reading comprehension, p.341–346. In C. C. Block, S. Parris, & P. Afflerbach (Eds.), *Comprehension instruction: Research-based best practices*. New York, NY: Guilford Press.

Leu, D. J., Forzani, E., Timbrell, N., & Maykel, C. (2015). Seeing the forest, not the trees: Essential technologies for literacy in the primary grade and upper-elementary grade classroom. *The Reading Teacher, 69*(2), 139–145.

Leu, D. J., Kinzer, C. K., Coiro, J., Castek, J., & Henry, L. A. (2013). New literacies: A dual level theory of the changing nature of literacy. In D. E. Alvermann, N. J. Unrau, & R. B. Ruddell (Eds.), *Theoretical models and processes of Reading* (pp. 1150–1180). Newark, DE: International Reading Association.

Livingstone, S., Haddon, L., Görzig, A. & Ólafsson, K. (2011). *EU kids online: Final report*. London, UK: London School of Economics & Political Science, EU Kids Online.

Mozilla. (2014). Mozilla web literacy map—1.1.0. Retrieved from https://learning.mozilla org/en-US/web-literacy

National Center for Education Statistics. (2017). Children's access to and use of the internet. Retrieved from https://nces.ed.gov/programs/coe/indicator_cch.asp

New London Group. (1996). A pedagogy of multiliteracies: Designing social futures. *Harvard Educational Review, 66*(1), 60–92.

November, A. (2008). Web literacy for educators. Thousand Oaks, CA: Sage.

Otter, M., & Johnson, H. (2000). Lost in hyperspace: Metrics and mental models. I*nteracting With Computers, 13*, 1–40.

Piaget, J., & Inhelder, B. (1972). *The psychology of the child* (2nd ed.). New York, NY: Basic Books.

Stahl, K. A. (2012). Complex text or frustration level text: Using shared reading to bridge/ the difference. *The Reading Teacher, 66*(1), 47–51. https://doi.org/10.1002 TRTR.01102

U.S. Department of Education, Office of Educational Technology. (2017).Reimagining the role of technology in education. *2017 National Education Technology Plan Update*. Washington, DC: Author. Retrieved from https://tech.ed.gov files/2017/01/NETP17.pdf

University of Connecticut. (n.d.). ORCA project overview. Retrieved from http://www orca.uconn.edu/orca-project/project-overview/

Vacca, J. L., Vacca, R. T., Gove, M. K., Burkey, L. C. Lenhart, L. A. & McKeon, C. A. (2018). *Reading and Learning to Read* (10th ed.). New York, NY: Pearson.

Warlick, D. F. (2009). *Redefining literacy 2.0*. (2nd ed.). Columbus, OH: Linworth Books.

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Christie Bledsoe began her career teaching secondary math and science in the public school system. Currently, she is an associate professor in the Doctor of Education Program at the University of Mary Hardin-Baylor, where she teaches research courses and supervises dissertations. Her research interests include teacher preparation, math education, quantitative research, and technology.

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Appendix
Concepts of Online Text

Knowledge

Instructions: Using the provided website, start with question 1, and ask each bulleted question in the order provided. When prompted, show the student the preselected/precreated website on a computer screen. Unless the task item indicates otherwise, verbal responses are acceptable. Score each question answered correctly with a 1 and each question answered incorrectly with a 0. Behavioral/response notes can be included below each item.

Task Item	Score

1. Knowledge of terminology—Ask:

  • How do you find information on the internet?

Examples of acceptable answers: Google, Yahoo, search engine, browser

Notes:

2. Orientation or layout of a website—Pointing to the URL, ask:

  • What is this part of a website? OR What is important about this part of a website? OR What goes in this space and what does it do?

Examples of acceptable answers: URL, address, name of website
[Student knows the function of the URL; it is not necessary to use the term.]

Notes:

3. Direction of print—Pointing to the screen, ask:

  • Where is the top of the page? Where is the bottom of the page? [Show me the top/bottom.]

Examples of acceptable answers: Student has the skills to either scroll or arrow to the top and bottom of the page (not just the screen)

Notes:

4. Website navigation—Point to a hyperlink and ask:

  • What does this mean? What does it do?

Examples of acceptable answers: Student either verbally mentions or describes a hyperlink and explains that it takes you to another page.

  • What is a way to move from this page to another page?

Examples of acceptable answers: The back or forward arrows, opening a new page by clicking on the tab by the URL, clicking on an image with a hyperlink

Notes:

5. <u>Knowledge of print and media</u>—Ask:

  • What is the title of the website?

Example of acceptable answers: Fact Monster

  • What type of information can you look at on this page to find out about the topic or main idea? What do you look at on this page to figure out what it is about?

Examples of acceptable answers: Student refers to headers, captions, images, audio/video

Notes:

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6. <u>Synthesizing Information</u>—Provide time for the child to review the website and then ask:

  • What is this page about (main idea)? How do you know? What are all the ways you can learn about groundhogs from this page?

Examples of acceptable answers: Groundhog Day, picture, title

  • Who is the author of the Groundhog Day article?

Examples of acceptable answers:

  • Who is the author or owner of the website?

Examples of acceptable answers: Fact Monster, Information Please, Family Education Network

  • When was this page published/created? How do you find the date this was published?

Example of acceptable answers: Copyright 2000–2016

Notes:

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7. <u>Evaluating Information</u>—Provide time for the child to review the website and then ask:

  • How can you tell if this website has accurate/true information? How do you know if you can trust it?

Examples of acceptable answers: Go to the home page and look for information about the publisher; it is part of the Family Education Network

Notes:

Q1–Q7 Score Summary