# Strategies for Comprehending Electronic Text in Digitally Mediated Times

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This paper discusses how readers need to be taught new literacies in order to fully comprehend electronic text. In a digitally mediated time when students are spending more time on the Internet than watching television or reading books, they need to be taught comprehension strategies as part of the literacy curriculum. Reading and comprehending electronic text can often confuse and overwhelm readers who have been taught to derive meaning from print-based materials only. This paper examines different comprehension strategies that will become essential to our students' literacy future including searching strategies, using graphic organizers, and evaluating websites for relevance and validity.

**Keywords**: literacy and technology; electronic text

## 1. Introduction

Digital technology is quickly transforming how we read and write. Students spend more time reading electronic text over the Internet than they do reading books, and with the advent of Instant Messaging and text messaging, electronic text is becoming pervasive and common. While listening to an iPod, downloading music from the Internet, or finding a phone number in a cell phone, we are reading electronic text and need to comprehend what we read. Lewis and Fabos (2005) argue that we need to reconceptualize literacy in digitally mediated times. This type of reading and writing is complex, can promote higher order thinking, and can foster complex reading and writing useful in the world of work or global communication.

Electronic text provides new text formats for readers to comprehend, and new ways to interact with the information. Reading and comprehending material on the Internet can often confuse and overwhelm readers who have been taught to derive meaning from print-based materials only. It is important that students learn the new literacies involved in reading electronic media and that teachers incorporate these new media into their curriculum so that students learn the skills necessary to comprehend electronic text. Proficiency in the new literacies of the Internet will become essential to our students' literacy future (International Reading Association, 2001).

The different types of electronic text readers will need to comprehend can be characterized as hypertextual networks that explore new types of story grammar and a variety of new formats (Coiro, 2004). Web-based texts are typically nonlinear, interactive, and include multiple media formats. Each of these formats presents a range of challenges for the reader that may require new comprehension strategies for deriving meaning because they require skills and abilities that go beyond those required for the comprehension of print-based, linear text which is being taught in schools today.

Some of the different types of electronic text a student may encounter on the Internet, in a software program, or on a digital device are (Coiro, 2004):

- **Nonlinear hypertext**: In this type of text which is often found on the Internet readers must navigate their own path through the information that may be different from the path that other readers chose, or follow a different path each time the reader rereads the material. Hyperlinks bring the reader to a location which provides more information about a particular topic or about a related subject. A reader must understand the advantages and disadvantages associated with having control of the direction in which text progresses and use inferential reasoning skills and context clues to discern one type of hyperlink from another (Coiro, 2004).

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- **Multiple-media texts**: Print-based text usually includes a combination of print and graphics or illustrations. Electronic texts can integrate a range of multiple-media formats including hypertext print written in different font size and color, icons, animation, photographs, advertisements, audio and video clips, and virtual reality environments. Images and sounds are used to create new ways of conveying meaning, explaining procedures, and communicating interactively. Readers must apply new ways of thinking about how to access, manipulate, and respond to information (Coiro, 2004).
- **Interactive texts**: Many sites on the Internet invite the readers to participate in the sharing of information by either posting their comments on a Bulletin Board, or to upload their work which can then be published. There are many "blogs" and "wikis" on the Internet in which the author keeps an online diary of events and readers are invited to participate by sharing their thoughts. E-mail and instant messaging has allowed the reader to instantly engage with text that can be shaped instantaneously and transmitted with a push of button. New comprehension processes are required for these electronic text environments. Readers must constantly self-monitor as they go through these interactive texts to ensure that they understand what the author means, and also to figure out what their role is in the interactive process, and if they feel comfortable in contributing to the interaction.
- **Online communication networking text**: This type of text is becoming more and more prevalent today with Instant Messaging (IM) and text-messaging using electronic devices such as cell-phones. This type of text is often truncated and cryptic, deploying special characters, colors, font types and abbreviations to convey messages. IM requires a user to read and respond to a message while performing other tasks on the computer and it often requires the user to address multiples audiences simultaneously. It actually blends spoken and written textuality into a hybrid language representing casual, insider exchanges of informal speech (Lewis and Fabos, 2005). There is a visual and aural element of IM: visual in the purposeful use of icons, letters, colors and font types to convey meaning, and aural in the way that text closely represented speech. Although this type of reading and writing is very different from the standard, traditional way that reading and writing is taught in schools, it can be useful in the classroom as a form of instant penpals for the students, as a way to collaborate with other classes on projects, or as a way to get instant help from other teachers in your school. Text-messaging requires the reader to interpret truncated, casual messages written in a hybrid language, as well, often read on a small LCD screen. In addition, students are being inundated with electronic text found on other digital devices such as iPods and hand-held devices. These all require new comprehension strategies to interpret the meaning of the written text.

In our global economy it is time that we teach the appropriate strategies to help develop this new literacy. This paper examines best practices that promote comprehension of electronic text and discusses how technology can be used to enhance and develop literacy skills.

## 2. Searching Strategies

Research on searching strategies (Kuiper, Volman, & Terwel, 2005) shows that children often have difficulties in locating relevant information on the Internet, and in assessing the relevance of the information. When they do conduct research, they stay focused on finding one answer to their question and will stop exploring after they think they have found the answer, even if it is at the first website they visit. Boys tend to spend less time than girls reading the texts on Web pages, and boys use fewer keywords in their searches than girls do. How the research question is phrased will also impact the search strategy and search results of students. When a question is self-generated or ill-defined, students will have more trouble searching for the information, especially younger children. When the question is well-defined and given by the teacher or instructor, students will have an easier time conducting a successful search.

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When conducting searches on the Internet for information, children display the following behavior (Kuiper, Volman, and Terwel, 2005):

1. Preference for browsing rather than entering keyword(s) and conducting a search.
2. Difficulty in formulating keywords for a search.
3. Limited exploration; much use of well-known websites
4. Little patience.
5. Difficulty with large amounts of text.
6. Tendency to focus on collecting factual knowledge rather than answering more conceptual, abstract questions.
7. Tendency to search for one correct answer.
8. Tendency to change the search questions when the literal answer is not easily found.
9. Little attention to reading and processing of information.
10. Difficulty in assessing the relevance of information found on the Internet.
11. Difficulty in assessing reliability of information found on the Internet.

These behaviors characterize young children as well as students in high school and higher education. Strategies should be taught that require a student to analyze, organize, synthesize, evaluate and report the information that is gathered from a variety of traditional and emerging electronic sources, thus using higher-order thinking skills. This process teaches students how to go through three phases of research: prospecting or searching for information, interpreting the information gathered, and creating a research report.

## 3. Using Graphic Organizers

Graphic organizers are graphical diagrams that portray the relationships among concepts and create a pattern of information that is constructed by an individual or group on paper, board, or computer screen (Hyerle, 1996). Graphic organizers help students to build their own knowledge-base, much like a carpenter builds a house (Hyerle, 1996). Research has shown that graphic organizers can improve reading comprehension (NICHD, 2000), improving the reader's memory for the content that has been read. Teaching students to organize the ideas that they are reading about in a systematic, visual representation helps them to remember what they read and improves their comprehension and achievement in all subject areas.

While traveling through multiple Web sites and gathering information, students should use graphic organizers to record the information they find. After they have visited two or three sites, they should start comparing the Web sites and explaining how they are different and alike. They could begin by comparing the basic visual look and specific visual details, and then they could move on to discussing ways the content is similar and different. A helpful tool is a simple chart such as the one below listing the features that should be compared.

| | Visual Layout of Website | Focus of website/ keywords found | Relationship of content to search | Source/Author of Website |
|---|---|---|---|---|
| Website #1 | | | | |
| Website #2 | | | | |
| Website #3 | | | | |

This allows students to become more critical readers and consumers of information. As they make comparisons and take notes, students will evaluate the quality and reliability of different source materials.

Because the Internet provides information in blocks of text and is capable of covering a vast amount of information in one site, it is often difficult for students to see the relationships between many of the concepts being discussed. An important skill for students is to be able to identify how the various

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pieces of information provided fit together. At different sites, the teacher can provide a graphic organizer for the students to map out the cause-effect relationships within the text and across sites. Posing a "why" question helps students identify the cause of a specific event and then it is easier to find the effect. A good cause effect graphic organizer is helpful to students to determine the relationship of concepts.

## 4. Evaluating Websites for Relevance and Validity

There are a multitude of websites available on the Internet which students are reading to access information for class and personal use. Every subject area has hundreds of different sites that students can access to find out more about a specific subject. An instructor needs to be very careful in evaluating websites before students access them to assess whether the pages are appropriate and if the text is written at an appropriate reading level. In addition, instructors should teach students how to evaluate websites to ensure that the information is meeting their needs. Too often a student will visit a website and not be able to read or comprehend the material, become frustrated and decide not to search any further for additional information. This is true for young children as well as college-age students which facilitates the practice of copying and pasting text into documents due to poor comprehension and inability to paraphrase what is not comprehended.

The American Libary Association recommends the following four steps are taught to student to evaluate websites:

1)Check on who is responsible for the website: Many URLs (Uniform Resource Locator) include the name and type of organization sponsoring the webpage. The 3-letter domain codes provide hints on the type of organization.

2) Check to see who is responsible for the website. Check for an Author: Look for the name of the author or organization responsible for the page and check credentials.

3) Check to see if there a clear purpose or reason for this site: Discovering the purpose can help determine the reliability of the site and the information it provides.

4) Check to see if the content is clearly explained, organized, and accessible.

## 5. Explicitly Teaching Comprehension Strategies

Although reading on the Internet requires the student to navigate different types of interactive formats, readers appear to apply many similar reading strategies as those used with print-based text reading, although in a different context and in different ways (Schmar-Dobler, 2004). Strategies that enhance comprehension when reading electronic text and that should be explicitly taught by the instructor are:

- *Generating Student Questions*: This is a crucial strategy when using the Internet as a student usually conducts a search and then must constantly keep the questions in mind while exploring different sites. It is very easy for readers to become distracted and start browsing sites that are not relevant to the question at hand. By the same token, oftentimes the reader will have to refine the questions and may come up with new ones as the search continues. It is recommended that students write these questions down before starting their search and keep them next to the computer to remind them of what they are looking for.
- *Navigating*: While reading the Internet students must become adept at navigating through a maze of links, icons, pop-up windows, and links that may or may not work. Students need to learn how to navigate through all the information and learn how to keep multiple windows open to conduct an efficient search. Navigation becomes a key part of the comprehension process while reading on the Internet and is unique to computer-based text material which is not linear in approach.
- *Previewing*: Before reading, students should set a purpose for reading and establish specific questions that need to be answered. They should preview the page and skim it to see if the page is appropriate for answering the questions. During-reading they should constantly self-monitor

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and if they find the reading level too difficult, they should close the page down and try another source of material. Post-reading students should summarize what they read, identifying the main idea of the webpage and going over what they learned.

- *Visaul Literacy*: Students will most likely need to incorporate visual literacy skills, as well, to interpret page layout, read graphs, navigate hyperlinks, and understand frames and pop-up windows.
- *Identifying Main Idea*: This is one of the key strategies in reading text on the Internet because much of the reading is expository text which will be used to build personal knowledge about a subject (such as on snowboarding or a favorite musical band) or for a class assignment. Readers must be able to identify the main idea of the frame and determine whether it matches with the question that they are trying to answer.
- *Synthesizing*: The student must not only identify the main idea but generate new theories of how this information applies to the topic; in addition the reader must combine many different links together to form the big picture and apply this synthesis to the unanswered question.

## 6. Summary

Comprehending electronic text requires readers to apply reading processes and strategies within a new context. Some tasks ask readers to extend their use of traditional comprehension strategies to obtain meaning from electronic text while other tasks, like conducting searches or partaking in online communication and collaboration projects, demand fundamentally different strategies not currently addressed in most literacy classrooms. Teachers should model and discuss key strategies used in comprehending electronic text to ensure that students are learning the new literacies. We must help students explore digital information environments and provide them with the necessary skills so that they are able to comprehend and apply the information that they learn. As electronic proliferates as a major source of entertainment and education, we as educators must ensure that our students are learning how to apply appropriate comprehension strategies to derive meaning and become successful citizens in digitally mediated times.

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