Literacy 2.0

Reading and Writing in 21st Century Classrooms

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Chapter 2

Finding Information: The Eternal Search

There is more information at our fingertips today than ever before. Remember doing a research project in high school? You had to physically go to the library and search the card catalog. Then you had to find the green books, *Guides to Periodicals*, to see where the journals you wanted were located (if your library had them). For example, Doug remembers an assignment from tenth grade related to World War I. The teacher wanted personal accounts of people who lived through the war, as well as factual information regarding the war. Doug went to the card catalog and looked up the subject "World War I." There were several entries, and Doug hunted each of them down. Some were useful for his paper, but most were not. Doug used an ineffective search strategy that consumed a lot of time.

Sound familiar? While the tools students use today to search for information have changed, the strategies they use have not. As their teachers, we have to instruct them in conducting effective information searches. This chapter will focus on efforts to help students locate information. But literacy 2.0 requires more than an effective search strategy. Unlike the sources Doug would have found from the card catalog, the Internet provides students with unfiltered information. Spurious screeds sit alongside valid information. Accordingly, we also have to teach students how to evaluate the information they find. The gatekeepers of information from the past no longer exert their control over what students find, and this presents additional challenges for the 21st century teacher.

Gatekeeping in Literacy 2.0

In the past, there were a number of gatekeepers that filtered information students would see. Materials were reviewed and approved. There were editors

and publishers and committees that sorted which information was "appropriate" for students and which was not. The Internet changed all of that. Just about anyone can post just about anything for the public to find. In some respects this system is a great thing, as ideas flow freely among and between people. On the flip side, there are more opportunities for the public to be misled or misinformed. Of course, the Internet did not create scam artists. Remember the "quacks" at the turn of the century who traveled around the country with their medicine that cured everything (www.collectmedicalantiques.com/quack.html)? The difference today is the scale and reach of questionable claims.

Having said that, the Internet is remarkably accurate, especially given the public nature of its contributions. It seems that the watchdogs are out in force to counter the claims that do not have evidence. There are even websites devoted to debunking the myths, and our favorite is www.snopes.com. As we were writing this book, we visited Snopes to investigate a rumor that was circulating at the time: "The CDC says swine flu is wiping out villages in Asia and will kill 60 percent of the U.S. population." We'd heard this rumor from several reliable sources, including a guest speaker who came to our school to talk about the importance of infection prevention. While infection prevention techniques are indeed important, we learned from Snopes that the rumor was absolutely false, and the claim that 60 percent of the U.S. population would die wasn't an accurate representation of the information from the Centers for Disease Control.

Wikipedia is an interesting case to consider in the discussion of gatekeeping. Written by anyone who wants to contribute, it has become the most frequently used encyclopedic resource in the world. But many teachers forbid students from using it, based on the perception that it's not very accurate because it lacks quality controls and gatekeepers. But a study published in *Nature* (Giles, 2005) suggested that the entries in Wikipedia were only slightly less accurate than those in *Britannica*. When *Britannica* disputed the claim, *Nature* clarified the methodology, noting that the forty-two experts who carried out the review did not know if they were reading an entry from Wikipedia or from *Britannica* ("Britannica Attacks," 2006).

To be honest, we often start our search for information with Wikipedia. It's quick, reasonably accurate, and fairly comprehensive in terms of topics. And it updates in real time, unlike the print encyclopedias sitting on our shelves that we can't bear to recycle. It is also important to know that from time to time Wikipedia will temporarily lock an entry if rapidly changing events are causing lots of conflicting posts. For example, the entry for Bill Ayers was suspended for a time during the presidential campaign of 2008 because of the number of postings that violated Wikipedia's requirements for neutrality and outside sources. (Click on the Discussion tab of any Wikipedia entry to view the debates about

information in an entry, and use the History feature to view edits.) Naturally, it's not the only source we use, and we know how to use it based on the task at hand. We know, for example, the difference between using Wikipedia to find out something that interests us (like a search Nancy just did about Chuck Close photorealistic paintings) and using Wikipedia when writing research articles. And that's one of the things we have to teach our students.

Teaching With Wikipedia

There are a number of ways for teachers to harness the power of the 2,000,000+ entries in Wikipedia, the first of which is to use the resource during modeling. As you recall from chapter 1, teacher modeling is an important component of the gradual release of responsibility. Biology teacher James Franklin models various skills while reading Wikipedia entries aloud. During one lesson, for example, he projects the Wikipedia page about decomposers (en.wikipedia.org/wiki/Decomposer). Starting with the photograph of fungi on a tree, Mr. Franklin activates his background knowledge, makes predictions, figures out words from the context clues provided, and makes connections between the information on the Wikipedia page and the textbook the students use. As part of his modeling, he tells his students:

> *Decomposer* is an easy term for me to remember because I know that *compose* is to put things together and that the prefix *de-* is the opposite. That's how I remember the meaning of the decomposers, generally. But as they say here, there is more technical information about decomposers. I see the parentheses and the word *or*, so I know that they're providing me with another word for the same idea. *Saprotrophs* is another word for decomposer. But I'm going to click that word and see what else it tells me, because it shows up here in blue. That means it's hyperlinked. Here it tells me that in addition to decomposer and saprotroph, they're also called "detritus feeders." Now I have three names for these types of feeders.

Mr. Franklin continues working his way through the text, modeling his thinking as he goes. At the end of the entry, he notices the warning, which indicates that the page has references but no inline citations. He tells the class,

> Oh, this is a page that I have to be careful with. There are references, and the references are to professional articles and books, but there aren't citations in the text that suggest where each idea comes from. That doesn't mean the information isn't accurate, but rather that I should check with other sources before using the information. As a quick check, I think I'll take a peek at the textbook and read a few paragraphs to see if there are ideas that differ.

In using Wikipedia in this way, Mr. Franklin alerts his students to a few key ideas. First, he signals to the class that he knows about Wikipedia, which will help prevent plagiarism and the inappropriate use of content from this

website. Second, he shows them that Wikipedia is a useful resource but one that has to be checked, like all other sources. And finally, he demonstrates how a purposeful user can utilize a Wikipedia entry to get an overview that can lead him or her to additional information.

Of course, modeling isn't the only use for Wikipedia in the classroom. Margaret Santori uses Wikipedia to build students' understanding of discussing ideas and to show them that disagreements can arise during these types of discussions. Using the Discussion tab on a given Wikipedia page, Ms. Santori invites students to analyze the ways in which people engage with one another. For example, there is a lengthy discussion on T. S. Eliot's page about his anti-Semitic views. Ms. Santori points out to her class that the individuals who contributed to the discussion did so in ways that were respectful of others. In one entry, the writer asks if Eliot's body of work "actually added to it [anti-Semitism] and nourished it." The conversation continues for several pages, with people adding their perspectives and references, all the while maintaining a respectful discussion. One person writes about Emanuel Litvinoff, a Jewish poet who, at a meeting with Eliot present, read a poem in which he "accused Eliot of, at best, indifference to the suffering of the Jews during WW2." Litvinoff's name is hyperlinked to another entry in Wikipedia that provides more information about him and his body of work, including a discussion of his human rights work.

As Ms. Santori notes, "This is the kind of discussion educated people have. It's civil, even when we disagree. And that's the kind of discussions we'll have in this class. You don't have to agree with one another about the topics and readings, but you do have to argue your position with evidence and compassion for others." In this case, Wikipedia has provided an example for behavior expected in the classroom.

These two examples of using Wikipedia in the classroom point to another important factor in literacy 2.0, which is becoming known as "three-dimensional reading."

Three-Dimensional Reading

We don't know who first coined the term *three-dimensional reading*, but we hear it all the time at conferences. In fact, it's becoming part of the educational lingo that teachers and researchers use to discuss Internet-based reading. In the old days of print-based reading, reading occurred in two dimensions: left to right and top to bottom. That's how you're reading this page. And two-dimensional reading applied to nearly everything we read, from novels to newspapers. While you could skip around, once you started reading something, you either read in the two-dimensional fashion or you abandoned your reading. In essence, the author was in control of the print and the way you experienced it.

But that no longer applies. Internet reading is three-dimensional. With hyperlinks, the reader is on a self-directed journey and may never finish the original page of information. With three-dimensional reading, we read across, down, and into. As blogger SayUncle says, "By hyperlinking something, the writer adds another place for you to go with respect to reading what they're trying to say. These links are usually facts, sometimes humor, or stuff that only serves to waste your time" (SayUncle, 2002).

As a case in point, we observed as a student used the Internet to find information about the Ring of Fire. To reduce some of the variability, we pointed her to a specific webpage to start with: http://geography.about.com/cs/earthquakes/a/ringoffire.htm. (More on teaching students to search for information is presented later in this chapter.)

The page begins with a definition and a hyperlinked map from the U.S. Geological Survey. Shelene doesn't choose that link but reads down the page a bit. She types, "75 % of all volcanoes are in the ring of fire" into her note page and keeps reading. She comes to a sponsored link and selects it. This takes her to a YouTube video of Johnny Cash singing "Ring of Fire" in 1963. She lets it play for a minute or so, laughs, and returns to the primary page. At the bottom of the page, she selects "maps of the Ring of Fire" and takes a look, but not for long, as she returns to the primary page and chooses "worst disasters in the 20th century." There are hundreds of words on this page, not hyperlinked. Shelene scans down the page, apparently not reading anything, and finds a link to "2004 Deadliest Earthquake Year in Five Centuries." After reading a few paragraphs (with no hyperlinks), she scrolls to the bottom of the page and selects "New York City Earthquake." No longer in the Ring of Fire, but not knowing it, Shelene adds notes about this earthquake to her open page.

We could go on, but suffice it to say that Shelene was acquiring information but not necessarily the information that she needed for her Ring of Fire project. The three-dimensional text was no match for her two-dimensional skills. She needs—no, she deserves—to be taught to find information in a three-dimensional landscape.

Teaching Students to Find Information

If you were asked to find out something, say, the name of the twenty-second president of the United States, where would you go? How would you find the information? If you're like most of the world, you'd Google it. According to Alexa, a company that tracks Web traffic (www.alexa.com), Google is the most

frequently visited site in the world. The top ten sites in the United States (as of this writing) are:

1. Google—www.google.com
2. Facebook—www.facebook.com
3. Yahoo!—www.yahoo.com
4. YouTube—www.youtube.com
5. MySpace—www.myspace.com
6. Amazon—www.amazon.com
7. Wikipedia—www.wikipedia.com
8. eBay—www.ebay.com
9. Windows Live—www.live.com
10. Blogger—www.blogger.com

Before we continue, let's take a minute and consider how the Web is most commonly used. Of the top ten sites, four are used for finding information, two for sharing information, two for connecting people, and two for online buying.

Most of us have used search engines to find information and know the basics of doing so. To search for the twenty-second president of the United States, most of us will go to Google and type "22nd president of the U.S." Using Google in this way provides easy access to accurate information. The first and second entries that will come up from this search will be from Wikipedia and will say that Grover Cleveland is the answer. As is the case with most Web searches, we will probably also learn something additional along the way. For example, we might not have remembered that Cleveland was the only president to serve two nonconsecutive terms or that his first name was Stephen.

But this search strategy isn't as efficient or effective when the topic is more general. When Corima selected the topic of women's roles in World War I, her initial Google search for **World War I** resulted in 143,000,000 webpages. Remember that this included pages that had the word *world* but not *war* or *I*. It also included pages that had the word *war* but not *world* or *I*. But Google is fairly sophisticated, and the first several pages of results that came up were about World War I, including the first entry, which was from Wikipedia.

How can we help this student narrow her search and find information specifically about the experience of women in World War I? Adding *women* to the search string (**World War I women**) results in more pages—153,000,000—not fewer. Corima needs to understand some simple commands to limit her search.

Boolean Operators

There are a number of Boolean search tools (www.internettutorials.net/boolean.asp) that Corima can quickly use to get more targeted results:

- Quotation marks—One of the ways we teach students to limit their searches is to place quotation marks around the search terms so that the pages found include the words in the exact string as written. For Corima, adding quotation marks around *World War I* and leaving *women* in the search string reduces the number of pages to 7,310,000. Of course, students can overuse the quotation marks. When Corima quoted her entire topic (**"World War I women's roles"**) she had only eight results, none of which were particularly helpful.
- + (plus sign)—This works similarly to the quotation marks used for phrases but is confined to single words. That is, it limits the search to pages that have all of the words, but the words do not have to appear in a particular sequence. One disadvantage of using this method is that most search engines automatically employ synonyms, so a person might end up with other terms that are not needed for a particular search.
- OR—Some terms are used interchangeably, and the person doing the search doesn't want to lose valuable information by limiting the search to only one term. For example, World War I is also known as the First World War. By adding OR between the two common names (both in quotation marks), Corima made her search more inclusive and ensured that the information returned would have one or the other of these two common terms. Of course, this increased the number of pages that Corima had to consider (25,000,000), but important information might have been omitted if she had not specified the interchangeable terms.
- AND—Another way for students to modify their search is with the term AND. This limits the search to pages with both of the terms, not just either one. When Corima typed **"World War I" OR "First World War" AND women AND role** (with "World War I" in quotes), the number of results she obtained was reduced to 7,970,000. The AND function provides additional guidance for the search engine and helps target appropriate pages for the user.
- NOT or — (minus sign)—When the person doing the search knows that there are a number of items that are commonly associated with the topic but that those items are not of interest, the modifier NOT is helpful. This removes the pages that have contents related to the exclusion criteria. In Corima's case, she was not interested in women pilots because her friend was writing about that topic. So her search string

read: **"World War I" OR "First World War" AND women AND role NOT pilot** (with "World War I" in quotes). The result was 45,800 pages that were very likely to contain information she could use.

Advanced Search Operators

Students can also search for information using specific terms, called "advanced search operators" or "meta words," to narrow searches. This method is especially useful when one knows about the existence of information and needs to locate it again. These words are used to preface search terms and are followed by a colon and then the desired information. Note that there is no space after the colon.

- **Site:** limits information to the domain name. For example, a student who wants information about hurricanes would type in **site:noaa.gov/hurricanes** to narrow the search to the 28,500 websites within the noaa.gov domain.
- **Link:** narrows a search to links to a particular website. For instance, the entry **link:www.noaa.gov** shows the 15,000 websites that have linked to this url address.
- **Inurl:** refines the search to Web addresses that feature the key terms. Therefore, **inurl:hurricane** yields 1,750,000 webpages with the term *hurricane* in the url address.
- **Intitle:** further restricts a search by identifying terms in indexed titles. A search of **intitle:hurricane + noaa** locates 69,500 indexed titles (usually documents) that contain the words *hurricane* and *NOAA*.

Specialized Search Engines

In addition to learning how to use search terms, students also need to know that there are specialized search engines that can be used to locate specific types of information. We are especially interested in the Directory of Open Access Journals (www.doaj.org) and have had great success with students using this search tool when they need technical information. For example, Jared was looking for information about toxoplasmosis for his health seminar and internship. Using DOAJ, he found 140 articles in which this topic appeared. The second entry, from the *International Journal of Medical Sciences,* included treatment information for ocular toxoplasmosis, which was what Jared needed in his case report.

We also like Search Engine Showdown (www.searchengineshowdown.com/features), as it provides current information about the top search engines and how they compare with one another. We ask students to use this as their starting page so that they purposefully select a search engine that matches their need.

Necessary Skills

Of course, teaching about specialized search tools assumes that students know how to use a search engine. Unfortunately, there is evidence that some students simply type directly into the address bar and hope they find something useful. For example, a student might type www.worldwar1.com into the address bar. Had Corima done this, she would have been lucky and would have been directed to a site devoted to teaching about World War I. A student who types worldwar1.net gets a site for sale with no information.

To address this instructional need, Donald Leu and his colleagues (2008) developed a checklist of skills students should master related to Internet use. A few of the items on their Teaching Internet Comprehension to Adolescents assessment include the ability to:

- Locate at least one search engine.
- Use several of the following general search engine strategies during key word entry:
  - Topic and focus
  - Single and multiple key word entries
  - Phrases for key word entry
- Use several of the more specialized search engine strategies during key word entry:
  - Quotation marks
  - Paraphrases and synonyms
  - Boolean
  - Advanced search tool use
- Select from a variety of search engine strategies to locate useful resources when an initial search is unsuccessful:
  - Knows the use and meaning of the "Did you mean . . . ?" feature in Google.
  - Adjusts search engine key words according to the results of a search.
  - Narrows the search.
  - Expands the search.
  - Reads the search results to discover the correct vocabulary and then use this more appropriate vocabulary in a new search.
  - Shifts to another search engine. (Leu et al., 2008, pp. 343–44)

Teaching students how to search for information is only the first part of finding information. Once the search results are in, students have to determine if the information is useful and credible.

Teaching Students to Evaluate the Information They Find

With the number of hits most searches uncover, it's overwhelming to figure out which are useful and which are not. Everyone has gone on a journey through the Internet, starting with a search for one thing and finding something else entirely. While this serendipity is sometimes fun and can be very informative, students need to be able to find specific information that is credible.

We like to start each school year (and sometimes each new project) with general conversations with students about the fact that there is bogus information on the Web. Donald Leu showed us a bogus website designed for the fictitious Pacific Northwest Tree Octopus (http://zapatopi.net/treeoctopus) and reported that nearly all of the middle school students in a study he and his colleagues conducted believed that there was such a creature and that it was endangered (Krane, 2006). Given that we teach in California, we're partial to the information the Web offers about Velcro crops and their sustainability, so we often start class with a discussion of the website devoted to this matter (http://home.inreach.com/kumbach/velcro.html). Many of our students believe that the site contains "important and accurate information" and even argue with us after we announce that the information is fake. Like most adults, our students were raised on the phrase "You can't believe everything you read." But like us, they do anyway. In this respect, Internet credibility isn't new. For decades, teachers have worked to instill a healthy dose of skepticism in readers and to teach students to question what they read. That's no different today.

Our current efforts to address the reliability of Internet sources are based on the work of Robert Harris (2007), who developed the "CARS [Credibility, Accuracy, Reasonableness, Support] Checklist for Information Quality." Table 2.1 is his summary of the checklist.

We use this tool to help students focus on various aspects of a website as they make decisions about the usefulness of the page. For example, seventh-grade science student Sean was looking for information on solar energy. In limiting his search, he found the site www.facts-about-solar-energy.com. As he investigated the site, he considered its credibility, accuracy, reasonableness, and support. Sean thought that the site was credible because it gave contact information for the authors of the site. He was impressed that the site originated in Australia because, to his mind, people "wouldn't care so much about politics there," which he felt added to the site's credibility. He also thought the site was accurate because it presented both the pros and cons of solar energy and provided a lot of information for each topic that it addressed. But he noted that the site hadn't been updated since 2006, which caused him some concern.

As he said, "The ads on the website are more current than some of the info on it. Like, they have Obama's plan in the ads, but the cost isn't right anymore. So there might be other things that are not current." On a more positive note, Sean thought that the information was reasonable and objective, even though the creators of the site were clearly advocates for solar energy. And the support the site provided seemed fairly good, as it referred people to lots of "different resources and places to get solar, rather than trying to send people all to one place." While Sean might be somewhat naïve about the contents of any website, he does know what to look for and can fairly easily spot sites that are designed solely to sell something or to persuade readers. He is developing a habit of looking at websites with a more critical eye, and hopefully, by the time he completes his schooling, he will be a critical consumer of Web resources.

Table 2.1: Summary of the CARS Checklist for Research Source Evaluation

Credibility	Trustworthy source, author's credentials, evidence of quality control, known or respected authority, organizational support. Goal: an authoritative source, a source that supplies some good evidence that allows you to trust it.
Accuracy	Up-to-date, factual, detailed, exact, comprehensive, audience and purpose reflect intentions of completeness and accuracy. Goal: a source that is correct today (not yesterday), a source that gives the whole truth.
Reasonableness	Fair, balanced, objective, reasoned, no conflict of interest, absence of fallacies or slanted tone. Goal: a source that engages the subject thoughtfully and reasonably, concerned with the truth.
Support	Listed sources, contact information, available corroboration, claims supported, documentation supplied. Goal: a source that provides convincing evidence for the claims made, a source you can triangulate (find at least two other sources that support it).

Source: Harris, R. (2007). Reprinted by permission.

Sometimes students have difficulty mastering the general concepts Harris outlined. In these cases, we formalize their review of websites using an evaluation tool like the one in figure 2.1 (page 44). When students use this tool, we meet with them to discuss what they found and to talk them through their analysis. Over time, we can reduce their use of this formal tool and return them to the general criteria.

In addition to teaching students how to find and evaluate information, we can teach them how to use information that has been collected and assembled by others. The new website-sharing tools can help students find more information than ever before when they know how to use them.

URL: _____

1. Title of website: _____
2. What is the main purpose of the website? (Is it selling something? Does it describe a service? Is it an educational site?)

   _____
3. Who created the website? (Is there a contact name? Is it a private company? Is it a school? Is it a government agency? Is there an "about us" section?) _____
4. How current is the website? (When was it last updated?)

   _____
5. Are links available to other sites? (Try some of them to make sure they work.)

   _____
6. Are there references or citations? _____ If yes, what are they?

   _____
7. What new information did you learn from this website?

   _____

   _____
8. What information is missing?

   _____

   _____

Figure 2.1: Website evaluation tool.

Social Bookmarking

Just as we might use a sticky note or fold the corner of a page in a book to know where we left off, we can *bookmark* website links (or add them to our *favorites* list) for future reference. All Web browsers offer this feature. The bookmarked data are stored in the computer user's Web browser profile. This

profile is a folder or file that contains all of the preferences and configurations set by the user. The role of the profile is to remember what the user likes and how he or she wants the browser to present, remember, and process information on the Web. Though bookmarking is a very useful feature to help store and categorize websites, it has its drawbacks. For one thing, using this method means that the bookmarks are tied to the computer on which they were originally stored. Second, if you want to share a website with someone, you must copy the site's address and paste it into an email message, a blog posting, or a comment on the other person's social networking page.

Fortunately, there is a much simpler, more effective, and more advanced way to keep track of and share those fascinating websites we find. This is where the "social" half of social bookmarking comes in. Using a service that resides on the Internet, one can share any information that is on the Web. This means the information is not tied down to a single computer but is attached to a user's account on a given provider. It is the same principle that is behind email storage, a system that allows the user to log in anywhere in the world and retrieve his or her messages. We are no longer tied down as much by location as by imagination!

The various social bookmarking services each have unique features that attract a particular type of user. But for the most part they offer a few common features, including online storage of bookmarked sites, rating systems, social interaction through a list of friends or an open community, and the ability to tag key words on websites. These key words can help future readers find information faster when they search for specific terms. For example, a website that has lots of information on different pages can have different tags on specific pages to help people locate information. Like everything in the Web 2.0 movement, most social bookmarking services offer profile pages that can be customized and browser plug-ins or add-ons for seamless integration. These features are designed to create a unique and streamlined Web experience.

Let's take a look at three different social bookmarking options. Digg.com is a website that acts more like a news site. The top stories are dictated by the highest numbers of diggs. Huh? Stay with us here. As we mentioned, some services provide rating systems. Digg.com uses "diggs" as a measuring unit to keep track of how many users "digg" a certain news item or webpage. The site's users choose what news items are interesting, and in doing so become part of a community with similar interests. Being able to have this type of freedom to determine what information is relevant gives online users a new voice. How could this help in a classroom environment? Digg maintains a searchable database of articles that have been "dugg." A search for "Health Care Reform" returns with various news articles that have users' ratings attached to them. This type of research can help a student acknowledge the different points of view regarding any given matter.

While digg.com focuses more on news items and the accumulation of users' votes, delicious.com sticks to a truer bookmarking experience. It too offers its own type of rating system, which is based on the number of people who have bookmarked a specific page. Easing the switch from an old-school, if you will, style of storing bookmarks on a single computer, delicious.com offers the ability to import bookmarks to its site and tag them. This enables users to keep their beloved bookmarks, tag them accordingly for organization, and share them with the world. Delicious.com is a barebones-style website that focuses on the content rather than outside, irrelevant distractions. Using this service can be a great way for students to begin their research, collect information, collaborate by sharing with one another, and finally compile a presentation.

Our last and perhaps most interesting recommendation is StumbleUpon (of course, there will be more of these types of tools developed every year). This service offers users smart suggestions for websites it thinks they might find interesting, based on criteria that they have preselected. Once users create an account at www.stumbleupon.com, they are asked to go through a list of categories and subcategories to choose what their interests are. They then use a StumbleUpon bar in their browser to "stumble" through random sites that the service suggests. While it might look trivial on the surface, there are more specific options and practices that can make the use of StumbleUpon more productive. A user can like or dislike a certain page, and the service learns from the user's choices for future suggestions. The user can also discover new pages and add them to the service's database. A specific category can be chosen if the user only wants to "stumble" sites that fall under it. Sharing and collaborating is easy through a send function that allows the user to send a website to another StumbleUpon user or anyone in his or her email list. The functionality offered by StumbleUpon can help a group of students tag, organize, and share from any computer in or outside of school.

All of these tools offer us a new way to search for information. It's not important to get caught up in the fancy visuals or the obscure terms, but it is important to know how to use these tools and to pass these practices on to our students, so that they can take full advantage of them.

Teaching Information to Find Students

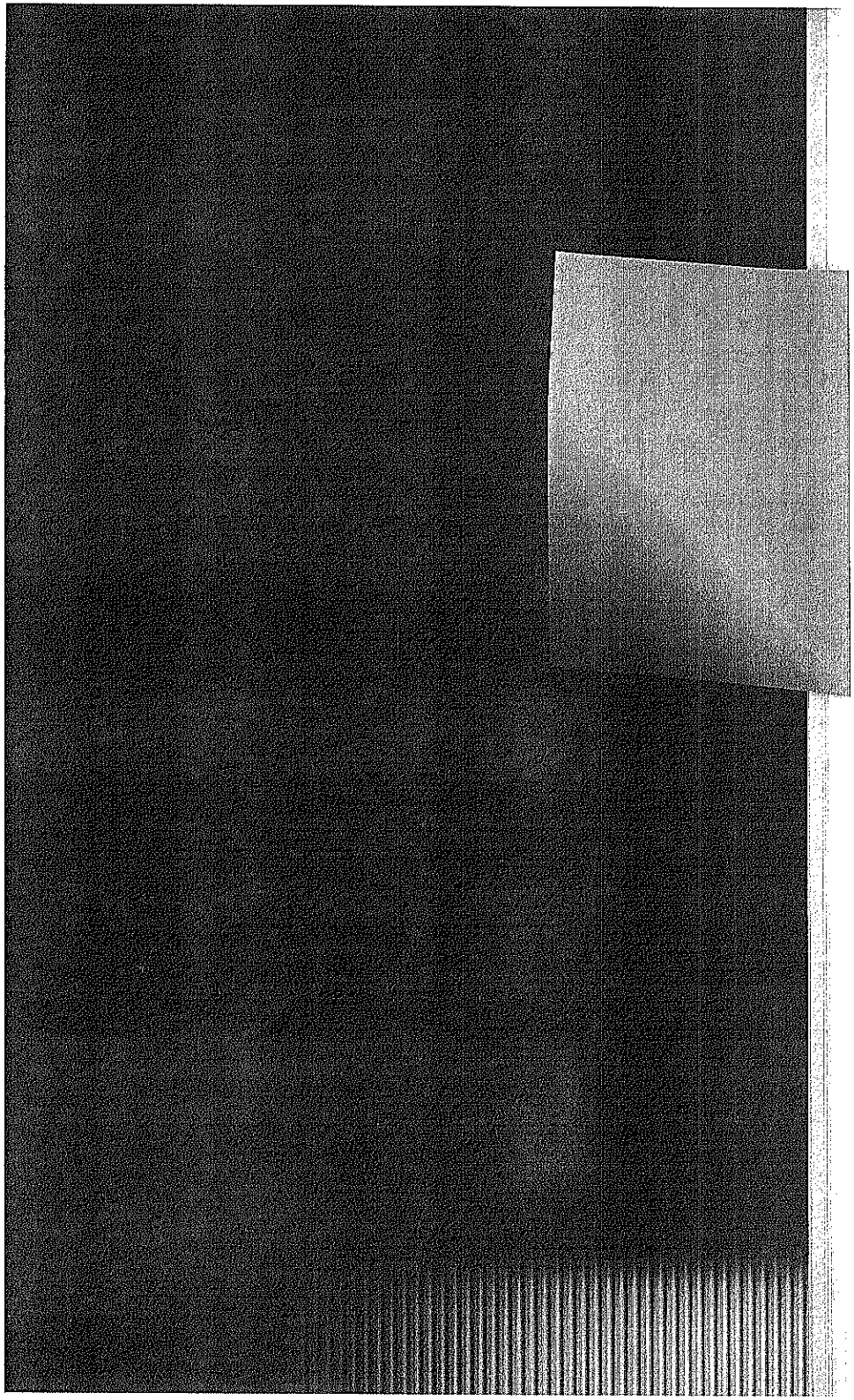
An overlooked phenomenon in education is the use of Web 2.0 features that cause information to find the student. In truth, our exclusion of these tools in our classrooms relegates students to understanding only half of the power of digital information sources. These Web feed tools (sometimes called news feeds) continually search the Web for new postings related to a person's interest. In effect, these tools pull information on behalf of the subscriber to keep him or her updated on events. Most of us use these in our adult lives, perhaps

by having gadgets installed on our home page that keep us informed about news events or by subscribing to the feeds from particular blogs and wikis. For example, Nancy uses a Web feed that notifies her whenever a new posting appears on a response to intervention wiki sponsored by the International Reading Association, while Doug is notified of new videos and reports produced by Edutopia, a nonprofit educational organization.

The most common Web feed tool is RSS (Really Simple Syndication). Many websites and blogs feature an RSS icon that invites you to subscribe so that new posts come to you, rather than having to search them out individually. An RSS subscription needs to go somewhere, however, so you must first sign up for a reader (think of it as a virtual notepad) that collects those Web feeds and holds on to them for you. The generic term for a reader is a Web-based aggregator, and the most widely known is Google Reader. Other Web-based aggregators include Bloglines and blogs.com, and many email systems have the functionality to collect Web feeds as well.

While students find social bookmarking useful for storing, tagging, and sharing websites, the information tagged is valid only on a specific site, and a user must check the site regularly to see any changes that have been posted. Using a website's RSS feed enables students to be notified as soon as there is an update. With some initial effort in the research stage of an assignment, students can benefit from this technology as their newsreaders are actively updated. If the students use an online service, such as Google Reader, the information follows them anywhere. We've often noticed how adolescents are glued to their cell phones. Whether it's reading a text or checking their favorite social networking site, they are connected 24/7. We can use this to our advantage, as there are newsreaders for mobile devices, including cell phones. Seems to be a trend, doesn't it? You find something, you like it, it follows you. No more need to keep track of various websites, and this is key to helping students stay on top of things. These types of technology not only help educate the student on a given subject, but they also teach him or her how to stay organized.

Take Andrew, for example, a student at our school. Among his various interests at age seventeen, his top two are homeopathic medicine and heavy metal music. While he explores alternative options in medical treatment, he can be damaging his hearing. Such are the extremes of an adolescent's interests. We offered Andrew the chance for both topics to meet in a single place, Google Reader. At first, Andrew seemed puzzled as to what we were showing him, but he came prepared with an open mind. Once he created an account with Google, essentially a Gmail account, we introduced him to the Google Reader page. Soon after we pointed out the search feature on the page, he was on his way to Googling for RSS feeds. This product offers RSS feeds cataloged by Google. Other applications offer the ability to search bookmarked pages and



add their feeds, eliminating the step of manually subscribing via a page's RSS or Atom (a different feed format) icon. After searching for both homeopathic and alternative medicine, Andrew narrowed his search and subscribed to Dr. Weil's website (www.drweil.com). This site offered information on various alternative medicine topics that Andrew could research. Along with Dr. Weil's RSS feed, Andrew subscribed to a feed from a website dedicated to publishing heavy metal and other music news, blabbermouth.net. Although these sites are dedicated to very different subjects, being able to access their information from a single interface, anywhere in the world, attracted Andrew. His world just became a whole lot more accessible.

Andrew's introduction to RSS feeds serves as a precursor to what could become a powerful research habit. As with many of the tools offered and spoken about in this book, the most important consideration is not what the technology can do but how it is used. Collecting data is one thing, but creating actual information that is valuable and relevant is the goal.

Chapter Tweets

While the need to search for information is not new, the tools have changed since we were in school.

Wikipedia can be a useful means for beginning a search because it provides a broad overview of a topic.

Boolean terms serve a useful purpose in limiting searches and are widely used on databases.

Advanced search operators can further refine Web searches.

Locating information is a first step, but students also need to be taught how to verify and evaluate information.

Remember that information goes two ways in literacy 2.0. Utilize Web feeds to cause information to come to students.

Chapter 4

Creating Information: Production in Literacy 2.0

"What's 'New Literacies'? What was wrong with the old ones?" We overheard this comment at a reading conference not too long ago and couldn't help but smile at the automatic assumption that new things always replace old things. While that may be true with some tools (after all, no one longs for an eight-track tape player), it is not true with functions. As we discussed in the introduction, the tools are going to continue to change with breathtaking speed. Even as we write this, we are fretting about our ability to keep current with technological developments. But we breathe a sigh of relief when we remind ourselves that the functions are timeless. The need to acquire, produce, and share information transcends the latest gadget or software.

New Literacies

Donald Leu and his colleagues acknowledge that new literacies (lowercase) can embrace a number of different areas, including informational literacy, discourse, reading comprehension, and learning strategies (Leu, O'Byrne, Zawilinski, McVerry, & Everett-Cacopardo, 2009). As they note, each of these new literacies (lowercase) draws from a variety of funds of knowledge that are informing our understanding as educators who are preparing learners in the 21st century. They offer four dimensions that collectively provide a working definition of New Literacies (uppercase):

1. New Literacies include the new skills, strategies, dispositions, and social practices that are required by new technologies for information and communication;
2. New Literacies are central to full participation in a global community;
3. New Literacies regularly change as their defining technologies change; and

4. New Literacies are multifaceted, and our understanding of them benefits from multiple points of view. (Leu et al., 2009, p. 266)

We see two common threads that weave through these elements, and both have direct implications for the classroom. The first is that while technological tools present new opportunities for learners to engage with one another, they should not be the tail that wags the dog but instead need to be continually considered against the backdrop of "old" literacies: reading, writing, speaking, and listening. Second, the ready availability of technological tools makes it imperative that we as educators abandon once and for all an outdated notion of learners solely as receptacles of existing knowledge. In literacy 2.0, we need to equip students with the cognitive tools that allow them to *produce and share* knowledge—using sounds, images, and texts—and the technological tools that provide them the means to do so. Students will still use their literacy 1.0 operating systems but will do so in new ways.

Podcasting: Creating With Voice and Video

Lexie sits in the corner of the room with her hood up and earbuds in her ears while eight of her classmates are working on computers, a small group of students are meeting with the teacher, five students are talking at a table about their PowerPoint presentation, several students are reading in a classroom library area, and several others seem to be working independently. The class is abuzz with activity, some independent, some collaborative, and some guided by the teacher. A visitor walking around the room and checking in with the students discovers that they are all working on history—the Industrial Revolution and child labor laws, to be exact.

It is clear to the visitor that students in this classroom are engaged in a range of experiences designed to deepen their understanding and that the teacher doesn't feel the need to talk at students for hours on end. In asking the teacher about the students' experiences, the visitor learns that this class period started with the teacher showing a video called "Children in the Industrial Revolution," which she found on TeacherTube (www.teachertube.com). This video was just a few minutes long and was paired with an interesting song. Following the video, the teacher modeled her thinking about the role of children and the jobs they were expected to do as well as why the creator of the video would have selected the specific song. At the completion of her focus lesson (see chapter 1), she reminded her students that their projects needed to be uploaded on the course website during the week so that they could "go live" for the whole school to see.

As you can imagine, the visitor was impressed with the overall operation of the classroom and both *what* and *how* the students were learning. But the visitor expressed concern about Lexie and her behavior, sitting in the corner listening to her MP3 player. She didn't seem to be "working," and the visitor questioned what she was getting out of the class.

Walking over to Lexie and asking her to pause her device and talk with him, the visitor learned that she was listening to a draft podcast that her group had made regarding child labor laws and the changes in the laws over the years. As Lexie said, "We've gotta get it edited so we sound professional and have the right info. Lots of people will hear this, and we want them to have accurate information." Yes, our assumptions about learning are challenged in classrooms that operate with a deep understanding of literacy 2.0.

So what is podcasting? Wikipedia describes a podcast as "a series of digital media files (either audio or video) that are released episodically and downloaded through web syndication" (Podcast, 2010). In other words, podcasts are sound or video files that can be shared with others. Most people have some experience with podcasts because iTunes provides a free service through which people can upload and share podcasts on a wide range of topics. The system operates via a subscription. When a user finds a podcast he or she likes, it's as simple as a click to subscribe, and then each time new content is added, the system grabs it and transfers it to the user's mobile device (MP3 player, iPod) when it is next connected. For example, National Public Radio often has the top podcast each week, and millions of people subscribe to this free service.

We ask our students to subscribe to the Classic Tales podcast. Each week, B. J. Harrison records a classic piece of literature and provides it free to all subscribers (for more information, see www.theclassictales.com). As we write this book, the current classic tales podcast is *Frankenstein*, which is spread over several weeks. Our colleagues have had students subscribe to podcasts from the History Channel, National Geographic, Science Daily, and various current events sites (such as ABC News, NBC News, and CNN).

Receiving information in this way builds students' background knowledge and provides an opportunity for the teacher to scaffold student learning. For example, Pak (2009) used podcasts with her students to develop their sophistication in writing. McDonald (2008) podcasts his physics lectures for students to access again and again, which allows them to develop deeper conceptual understandings.

There are many examples of using podcasts to convey content to students. But this chapter is about students producing information. And podcasts provide students with one way to share their thinking with a wide audience. That's just what the students in Lexie's group were doing. They created a podcast using the Audacity software program (http://audacitysourceforge.net). Audacity is free, open-source software for recording and editing sounds. It is available

for Mac OS X, Microsoft Windows, GNU/Linux, and other operating systems. Using Audacity, students can:

- Record live audio
- Cut, copy, splice, or mix sounds together
- Change the speed or pitch of a recording
- Dub over existing tracks to create multitrack recordings
- Remove static, hiss, hum, or other constant background noises
- Import and export files

The great thing about Audacity is that, in addition to being free, it's very intuitive and students can use it immediately, with very little training required. In fact, most of our students already know how to edit because of iMovie or GarageBand and easily transition to editing using Audacity.

As part of their podcast, the students provided listeners with information about child labor laws in effect today. For example, Brian, one of the students in the group, explained,

> Minors, people under eighteen years of age, cannot do any work that the U.S. Department of Labor says is hazardous. These hazardous jobs usually involve excavation, mining, manufacturing explosives, and operating several types of power-driven equipment. Of course, some minors do these things at home with their family. Like, I've used a chain saw to cut trees, but my dad was there. The child labor laws say that I can't do this as a paid job.

When asked about their podcast, the members of Lexie's group indicated that they obtained information from a number of sources, including their textbook, the Internet (and specifically Wikipedia, the U.S. Department of Labor website, and www.stopchildlabor.org), and primary source documents such as contemporary political cartoons, editorials, newspaper articles, and interviews. Their podcast demonstrates their understanding of the content and their ability to use components of literacy 1.0 to create information that is consistent with literacy 2.0.

Of course, podcasts aren't limited to audio files. There are video podcasts (also called vodcasts or vidcasts), in which images are used in conjunction with spoken words. Video podcasts range from recorded PowerPoint presentations to full productions with video cameras and Photoshop editing. We recently had a student create a video podcast as part of her response to the essential question "Does age matter?" (A later section of this chapter will discuss essential questions in more detail.) In her video, Lapresha interviewed teenagers and adults about this question and compared and contrasted their responses. At the end of her video podcast, Lapresha offered her perspective on the question

and concluded that age doesn't matter but maturity and responsibility do. Like Lexie and her group, Lapresha had to use a number of literacy 1.0 skills as well as literacy 2.0 skills to make her case. As is consistent with the concept of 2.0 applications, Lapresha's product was different from the product of any other student. It was hers and, as such, represented her thinking, her skills, and her understanding. As Knobel and Wilber (2009, p. 24) point out, "Literacy 2.0 means students take the reins," which is really the case when they create their own products and information.

Talking Pictures: Creating with Images

As we just noted, students often create with images. Images are powerful tools that communicate at both the conscious and subconscious levels. Just think about the use of images in commercials, political ads, and billboards. Marketing experts have long recognized the power of the image to communicate and persuade. Children also communicate through images and do so from the time they are very young. All parents of young children have a few of these images on their refrigerators and display them proudly as they recognize the cognitive processes required to create them.

Today, students can create images with more than crayons and paint. There are a host of tools available for creating and manipulating images. Some of these tools are quite expensive, and others are not. Sometimes they involve movie making, and other times they don't.

We'll start our foray into the use of images with a website that William Zimmerman developed to help students communicate through comics (www.makebeliefscomix.com). Students can use this site to create electronic comics that they can then save, print, or email to others. The site allows users to select from a number of characters, change the emotion of the character (which is a great teaching point in and of itself), add dialogue, and create a storyboard. One of Zimmerman's recommendations, which we have used, is to ask students to create an autobiographical comic strip about themselves and their families at the start of the year. While some students work on their introductory comics, others complete pre-assessment tasks, and others meet with the teacher to set goals for the year. We have found this activity to be a great way to start the year, as well as a way to communicate that we use technology tools in school as part of our learning. An example of a student's autobiographical comic appears in figure 4.1 (page 76, used with permission). Of course, Zimmerman's website can be used for more than student introductions. We've had students create comic strips about the books they've read, a colleague in math had students create comics demonstrating how to solve a specific problem, and a colleague in biology had students create comic strips about endangered species.

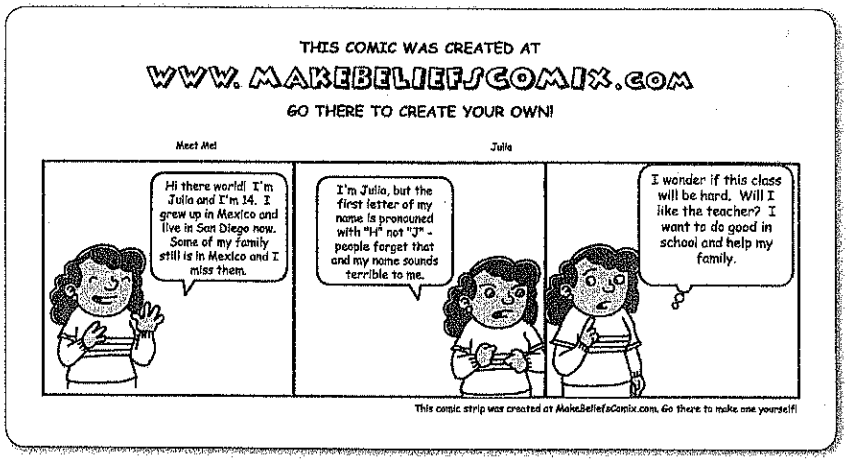


Figure 4.1: Julia's comic.

For a small fee, students can purchase a software program called ComicLife (available at http://plasq.com/comiclife) to create electronic comics. This program allows users to import photos and drawings as well as to create larger panels and pages. But the idea is still the same: students creating information with visuals (and words) that convey their understanding of the content. Our students also use GIMP (www.gimp.org), which is free, open-source software for image manipulation, photo retouching, and image authoring. They have become very skilled at image manipulation and now regularly question the images in textbooks.

Let's not forget that most mobile phones take reasonably good pictures, and many students own digital cameras. In other words, students can document their experiences with digital images and produce content with those images. The students in the earth science class are frequently outside, collecting samples and observing nature. They see tide pools, erosion, geologic records, mountains, and tons of other things all for free within a short ride of the school. Of course, their teacher also teaches them about the things they're seeing, and they do labs and other projects in class, including Internet research, but when they are in the field, they are required to document their findings visually. Students who do not have their own cameras share the school cameras. On a recent trip to the tide pools, the students documented the types of creatures that lived there, the times and tide levels, and the phase of the moon. They were all given information to look for but were encouraged to present it in a way that made sense to them.

Karen printed her photos on plain copy paper and created a photojournal of the experience. Brittney created a collage of her pictures using Photoshop and incorporated images from the Internet to add details. Javier developed a visual time line that documented the day and provided readers with details about the experience. Felicia posted her photos on Facebook and included commentary on each of them. Interestingly, other students from the class commented on Felicia's pictures, adding information and asking questions. Robert geotagged his photos, linked them with Google Earth, and wrote descriptors for each. Kim imported hers into PowerPoint, animated them, added background music, made audio recordings of information for each, and timed the transitions so that each photo would be seen while the information was relayed. Justin added his photos to his personal blog and wrote details about each picture. Again, these students used a number of literacy 1.0 processes and procedures to create usable information for both themselves and others. In doing so, they validated and extended their understanding of literacy 2.0 experiences.

Of course, students also have access to video recorders and really do love to record their world. Today, anyone with a few hundred dollars can make a movie. Just think about the explosion of content, much of it not very good, on YouTube. Really, how many times can you watch amateur skateboarders, dance recitals, and pranks? But there is something to be said for making movies. When we give students an opportunity to create with talking pictures, their imagination often soars, and they astound us with their creations.

In terms of tools for creating movies, we are most familiar with iMovie, as it is a fairly inexpensive and easy-to-use system for video editing (and comes free on new Apple computers). For PC users, Microsoft Movie Maker comes free on newer computers. Of course, there are much more professional systems available, such as Sony Vegas, Final Cut Pro, CyberLink PowerDirector, Corel VideoStudio, and Adobe Premiere.

As an example of making a movie as a classroom assignment, students in a biology class created video shorts about endangered species. They could collect stock footage or images or film the animals themselves (if they had access to their assigned animal). Their videos needed to include, at minimum, information about the animal, its habitat, why it was endangered, and what efforts were under way to prevent the animal from extinction. Students worked in groups of three to produce their videos. Mario, Brianna, and Omar focused their efforts on frogs. As they worked on their video, they learned that there are over one hundred types of frogs on the endangered species list and that Wikispecies has a complete taxonomy and searchable database. Their video introduces the topic, focuses on why frogs are endangered and threatened in different places in the world, and then profiles a few examples. As one of their examples, they showed a California red-legged frog (*Rana aurora draytonii*)

and discussed an interview they did about the frog with a representative of the U.S. Fish and Wildlife Service. They noted that this frog was being protected in their hometown at the San Diego National Wildlife Refuge. Omar appears in the video, explaining the current recovery plans and petitions that have been filed to protect this particular frog.

This is just one example. There are hundreds of examples of students producing talking pictures as part of their efforts to create and understand content. The point is that students engage in content in different ways in classrooms that facilitate literacy 2.0. They're still learning the content and language but doing so in ways that are personally relevant and that give them opportunities to interact with ideas and others.

Access to an unprecedented amount of audio, visual, and textual information challenges us as educators to keep informed about the laws and guidelines governing classroom use of these materials. In particular, the legal definition of fair use in copyright law continues to evolve as technologies and literacies collide.

Fair Use

In the previous chapter, we discussed the importance of teaching students about plagiarism and its avoidance, focusing on how they can properly attribute the works and ideas of others. Unfortunately, experience has taught us that teaching about plagiarism can lead to overcompensation and breed fear among students and educators. In particular, the plagiarism unit usually triggers more questions about copyright law. First are the urban legend–style stories ("I heard about a teacher from Pennsylvania who was sent to prison for two years because she painted Disney characters on her classroom wall"). Next is the "err on the side of caution" mindset ("I'm not going to use anything in my classroom that doesn't come with the textbook"). There's usually a scary sign posted somewhere near the photocopier that warns users away from reproducing materials without written permission. In the meantime, students are blithely sampling images and sounds from the Internet without regard for attribution, "confusing access and plagiarism" (Badke, 2007). If teachers avoid the topic, the students incorrectly understand the silence to mean that there are no guidelines.

But there are guidelines, even if they are rarely taught in classrooms. The Copyright Act of 1976, which protects published works, contains a provision on "fair use." It states that the use of copyrighted material "for purposes such as criticism, comment, news reporting, teaching (including multiple copies for classroom use), scholarship, or research is not an infringement of copyright" (Cornell University Law School, 2009). The purpose of this provision in the law is to protect educational use of materials. Legal judgments about whether the use of copyrighted text, images, or audio constitutes fair use are based on four factors:

1. the purpose and character of the use, including whether such use is of a commercial nature or is for nonprofit educational purposes;
2. the nature of the copyrighted work;
3. the amount and substantiality of the portion used in relation to the copyrighted work as a whole; and
4. the effect of the use upon the potential market for or value of the copyrighted work. (Cornell University Law School, 2009)

The language of the law is sufficiently obtuse that most educators either avoid using particular materials altogether or use them and hope they won't get caught. Neither is a particularly useful model for students, who will also need to make choices about using the works of others. Fortunately, a consortium of education and communications experts collaborated to create materials to make all of this easier to understand. In addition, they developed guidelines in 2008 for students and educators to use in determining whether the doctrine of fair use applies to their situations. These guidelines have been endorsed by a number of respected education groups, including the National Council of Teachers of English. The guidelines can be summarized with five basic principles:

- **Principle 1.** Educators engaged in media literacy can use copyrighted materials to teach students in classrooms and on school websites. These materials should be properly attributed.
- **Principle 2.** Educators can integrate copyrighted materials into classroom lesson plans, using proper citations for the materials.
- **Principle 3.** Educators can share these lessons containing copyrighted materials at conferences and professional development events, including through digital means. Copyrighted material should be properly cited.
- **Principle 4.** Students can use copyrighted material for classroom assignments and educationally related creative work. Students should be taught how to correctly attribute copyrighted material in their work.
- **Principle 5.** Student work containing copyrighted materials can be shared in educational venues and on educational networks for the purpose of learning. As always, copyrighted materials need to be adequately cited. (Center for Social Media, 2008)

It is important to note that guidelines are not law and that it is the interpretation of law through court cases that clarifies and refines meaning. Case law on fair use suggests that several conditions must apply:

- The *context and situation* of the usage are such that the benefit to society outweighs the cost to the copyright holder.
- The use is *transformative* in that the material is being used in a way that is substantially different from the intent behind its original creation, and the use gives the material *added value.* (Center for Social Media, 2008)

Still unsure? Nearly everyone deeply involved in fair use will tell you that these factors, guidelines, and principles are not cut-and-dry. As case law continues to shape our understanding of fair usage, especially of digital media, what is allowable may change as well. In an effort to support educators in making decisions about fair use, the American Library Association's Office for Information Technology has created a tool to help. Called the Fair Use Evaluator, this website (http://librarycopyright.net/fairuse) allows you to submit a description of the material you are planning to use and the context in which it will be used. You will receive a time-stamped evaluation, useful in case you are challenged by a copyright holder. If your project does not meet the criteria set for fair use, you will be informed of that as well.

So far we've moved from copyright law and its four factors for determining fair use to guidelines developed by a consortium of media educators and legal experts on classroom applications. Case law has further determined and upheld that an educational context and transformative use provide additional strength to the fair use of properly cited copyrighted material. These complex ideas have themselves been transformed into a series of PowerPoint presentations, music videos, and lesson plans designed with teachers and students in mind and available from the Media Education Lab at Temple University (http://mediaeducationlab.com). As always, keep fair use in mind as you correctly attribute these materials for your students. As we have stated throughout this book, teachers' modeling of the concepts they teach is arguably the most powerful tool they have at their disposal.

Digital access is continuing to reform the landscape of copyright protection, and important issues hang in the balance. On the one hand, copyright was established to protect creative endeavors by ensuring that artists could make a living from their work. On the other hand, the limitations placed on copyrights may artificially inhibit intellectual growth. Nonprofit organizations such as Creative Commons are attempting to bridge this divide, with positive results for students and teachers.

Creative Commons

The stated mission of Creative Commons, which was formed in 2001 in San Francisco, is to "increase sharing and improve collaboration" (Creative Commons, n.d.). A leader in the "copyleft" movement, the organization provides copyright licensing at no cost so that the artist or creator can determine which copyrights should apply to his or her given work. Licensees decide whether their work can be used commercially, if the work can be altered or not, and if subsequent users must also agree to share the new work on CC (called "share alike"). Some creators choose a fourth option, designating the work as public domain and thus free of any copyright protection.

The company estimates that over 130 million works are licensed through it, including high-profile projects such as music by Nine Inch Nails (Creative Commons, n.d., History). The photo-sharing website Flickr (www.flickr.com) allows users to add a Creative Commons license to make images available. In June 2009, Wikipedia announced that a Web-based vote of its community came out overwhelmingly in favor of changing its own licensing agreement to a Creative Commons one that requires attribution and share alike.

The organization is not without criticism. Some of the restrictions dictated by copyright law are meant to protect the rights of the copyright holder. Creative Commons has made a few errors in granting licensing for works that did not actually belong to the applicants. One example would be failing to receive permission from all the participants in an image. It is important to note that there have only been a few of these incidents, and the likelihood that Creative Commons material is not correctly vetted is very small.

The copyleft movement has spread to the science community as well. Projects such as the Health Commons Project (www.healthcommons.net) and NeuroCommons (www.neurocommons.org) allow scientists from across the world to trade data and findings. The Personal Genome Project (www.personalgenomes.org) is amassing DNA mapping results from 100,000 volunteers, allowing researchers to utilize the database in order to implement their studies. The concept is that researchers will not have to waste valuable time locating study volunteers, because the database will already exist. Scientists will be able to specify the typology (Asian women with a family history of breast cancer, adult males between the ages of thirty-five and fifty who smoke, and so on) and perform analyses.

While accessing a genetic database does not have direct classroom implications, the notion of analyzing the results of DNA mapping does. Health teacher Althea Lincoln profiled the work of the Personal Genome Project by showing her ninth-grade students a short video clip (PBS, 2008) and then leading a discussion about the possible benefits of the project. She charted the suggested

benefits, such as fueling advances in medicine. She then showed the class the profiles of the first ten people who had contributed their genetic samples to the project (www.personalgenomes.org/public). The students viewed the ten volunteers' profiles, which included disclosed medical histories of cancer, depression, and specific syndromes. Ms. Lincoln asked, "Is there a disadvantage to having information like this out there?" The class discussed a few drawbacks but couldn't really come up with any significant ones, so she next had them read an opinion piece published in the student newspaper *The Harvard Crimson* (Meisel, 2007). The article discussed advantages and disadvantages of making such information public and imagined a presidential candidate of the future who is forced to withdraw because his DNA sequence shows that he carries the gene for Huntington's disease. The class debated the pros and cons, and Ms. Lincoln added their points to the chart.

She then invited the students to watch excerpts from the *NOVA* television program titled "Cracking the Code of Life" (Arledge & Cort, 2001). The excerpts focused on genetic diseases like cystic fibrosis and raised questions about the ethics of genetic testing. Afterward, Ms. Lincoln drew the students' attention back to the reading, specifically the section on the need for legal protections so that people won't be denied employment, housing, or insurance because of their genetics. Having built their background knowledge and introduced complexities that defied simple answers, she had all her students go to an online poll and answer four opinion questions about genetic testing and gene sequencing (visit go.solution-tree.com/literacy to find the URL for the poll). The website reported immediate tabulations of the poll results to date. After each question, the students discussed their opinions and insights and compared them against the opinions of others who had taken the poll. "There aren't any clear-cut answers," Ms. Lincoln remarked later, "but I want them to appreciate how advances in science and technology challenge our decision making."

Essential Questions

Ms. Lincoln and her students were considering the elements of decision making as part of a larger exploration of a schoolwide essential question that asked, "If we can, should we?" The purpose of an essential question is to foster inquiry and speculative oral and written discourse that is supported by factual knowledge (Wiggins & McTighe, 2005). As mentioned in chapter 1, essential questions are deliberately crafted to be open ended and should defy simplistic yes/no answers. This is not to say that anything goes and that all responses are equally meritorious—quite the opposite. The best responses to these complex questions are arguments that include elements of logic (*logos*), emotional appeal (*pathos*), and ethics (*ethos*). The teaching of argumentation is consistent with adolescent intellectual development, as young people in this age group

begin to take on propositional reasoning—the ability to arrive at solutions, opinions, and understandings.

As you can imagine, the purpose of essential questions is for students to produce, and not just consume, knowledge. In a literacy 2.0 curriculum, students use a host of tools to demonstrate both their understanding of concepts and their facility with the formal academic thought of argumentation. The major project of the term is a formal essay that addresses the essential question through rhetorical writing that uses *logos, pathos,* and *ethos* to support the student's position. In addition, students respond to the question throughout the term using a number of other formats, such as podcasts, songs, and poetry.

During the nine weeks when the entire school explored the essential question "If we can, should we?" teachers organized the curriculum to foreground concepts related to the question. We saw how Ms. Lincoln did this with her health class. In English, tenth-grade teacher Heather Anderson used the dystopian novel *1984* (Orwell, 1949/2003) as a touchstone text for shared readings, teacher modeling, and class discussion. She also gave students a list of books to choose from for their independent reading so that they could extend their knowledge of course concepts such as literary devices while building their understanding of the complexities inherent in the essential question. Among the titles available to students were:

- The graphic novel *Persepolis*, by Marjane Satrapi (2004), which chronicles her adolescence in a repressive regime
- *Nickel and Dimed: On (Not) Getting By in America*, by Barbara Ehrenreich (2001), a nonfiction account of economic challenges faced by workers across the country
- *The Boy in the Striped Pajamas*, by John Boyne (2006), a novel of the Holocaust, told from the perspective of a small boy
- *The Joy Luck Club*, by Amy Tan (1989/2006), a novel that uses flashback to tell the parallel tales of several generations of an American family in San Francisco and China
- *The Curious Incident of the Dog in the Night-Time*, by Mark Haddon (2003), an account of a neighborhood crime as told by a teenager with autism
- *Wringer*, by Jerry Spinelli (2004), an easier read that describes the moral and ethical conflicts felt by a young boy in a small town with a Pigeon Day shoot
- *The Prince*, by Niccolò Machiavelli (1532/2007), a classic guide on decision making in politics and business

As the students read their chosen books, they met regularly with Ms. Anderson and other students to discuss general literary elements like author's

craft, as well as specific aspects of the characters they were reading about, such as the tools of reasoning that they used. Each week, the students wrote "literacy letters" to their teacher to summarize where they were in the book thus far and to discuss their reactions and understandings (Frey, Fisher, & Moore, 2009). Here is an excerpt (used with permission) from a letter by Ryan, who was reading *The Curious Incident of the Dog in the Night-Time*:

> Dear Ms. Anderson,
>
> I am reading *The Curious Incident of the Dog in the Night-Time* by Mark Haddon. It is about a boy that has autism that tries to solve the mystery of who killed his neighbor's dog. He is very intelligent and dislikes talking to people. He has a difficulty with socializing, but he knows how to do very complicated math. The book is a book the character is writing, and he runs into another problem involving his mother while trying to solve the mystery.
>
> I have never read a book about autism. I like how the author puts readers into the mind of a child with autism. They can be very smart and just like normal people, but they have a trouble relating to other humans. People look at autistic people differently, just like in the book. The character showed me that they can think just as logically. Whenever he said something or gave an opinion, he gave a logical reason for it, except for his ticks. He doesn't like yellow or brown, but he never tries to justify it, saying he doesn't like yellow or brown. I think obsessive compulsive disorder might explain his odd habits. I also met a person with autism yesterday. He has an obsession with Naruto and Yu Gi Oh cards. He is a little out of touch with reality, but I understand it better now.
>
> Sincerely,
>
> Ryan

Ryan's weekly discussions with Ms. Anderson, both in person and in writing, helped him to discern the manner in which people make decisions and to see how a person's identity and experiences influence those decisions.

Using iMovie and GarageBand, eleventh-grade student Rita created a multimedia piece to address the essential question in a way that was both personal and academic. When her U.S. history class studied immigration, Rita related the content to her own experience. She and her younger siblings were all born in the United States, but her parents and older brother were not, and some members of her family were undocumented. Rita had grown up in a household where *la migra,* the U.S. Immigration and Customs Enforcement, was ever present in their lives. She wrote a poem for her English class that drew on her understanding of poetry as a vehicle for personal expression. She enhanced the poem with an image (from a photograph she had taken) of a window with the blinds drawn in a darkened room and a soundscape that simulated a beating heart, which was available though Creative Commons licensing. The text of her poem follows (used with permission).

If we can, should we?

Time is running out!
They will find me any second.
I wish I could have been crystal clear!

Why are people so lifeless?
Just because I have brown eyes
Doesn't mean I am dangerous!

How many times do I have to hide?
Why do they judge me for how I look?
I just don't understand!
Moms are yelling.
Kids are running.
Fathers are being wounded
And I am hiding in the darkest
room you'll ever see!

And see, everything is back to normal.
But something deep down in my heart says
That will never happen.

Time is running out!
They will find me any second.
I am almost out of breath.
My blood has suddenly stopped.
What should I do?

Josiah, another eleventh-grade student, was inspired by current world events. He turned the essential question into an interrogation of the role of war as a tool for maintaining and destroying order. He was particularly moved by the dilemma facing soldiers who must make a choice to go against all the norms and values they have been taught in order to take a human life. As a young man nearing the age when he would need to register for the draft, Josiah was beginning to question whether he would be capable of making this decision. He researched the laws pertaining to conscientious objectors and read about draft dodgers who fled to Canada during the Vietnam War. For his English class, he read the novel *Slap Your Sides* (Kerr, 2001) about a young Quaker who refuses to serve in World War II. He also watched the documentary *The Conscientious Objector* (Benedict, 2004) about Desmond Doss, who was awarded the Congressional Medal of Honor for his service as a medic in World War II. Josiah learned that Doss refused the deferment he was entitled to and served in battles in the Pacific theater. Using the GarageBand program, Josiah wrote, produced, and recorded an original song titled "If I Can Then Why Can't I?" to portray the paradox of a soldier who was been given the license

to shoot to kill but finds that he can't pull the trigger. The text to Josiah's song follows (used with permission).

If I Can Then Why Can't I?

Intro

If I can then why can't I?
My living deed
The decision's mine
I lie still
The pain intervenes
I miss my life the living scene

Verse

Red the color coming from his head
The color soaked the soldier's bed
The privilege given to me
It's the privilege that I weep

Chorus

If it's there then why can't I?
If it's his will to live or die
If it's there then why can't I
If it's his will to live or die
For you
And me
If we can then should we?

Verse

Day to night
I'm losing sight
Of all of this s**t
This is the life
I gave you a choice you chose one way
Now you're gone out of misery
Misery

Chorus

If it's there then why can't I?
If it's his will to live or die

Tonight
If it's there then why can't I?
If it's his will to live or die
For you
And me
If we can then should we
Do no harm?

The learning experiences of Ryan, Rita, Josiah, and others are prime examples of combining the "old" and "new" literacies of a literacy 2.0 curriculum. Students use the more traditional reading, writing, speaking, and listening elements of learning, as well as the tools afforded by technological advancements that allow them to create and share knowledge using sounds, words, and images. The emphasis, as always, is on the verbs.

Chapter Tweets

New Literacies invite students to use the tools of language to create knowledge. The trick for us is to figure out how to do it!

Podcasts allow students to produce information in a format that is readily accessible.

Podcasts also cause students to monitor their conceptual understandings through playback.

Video tools give students the opportunity to combine text and images to produce original works.

Fair use laws and guidelines give educators more latitude than is often believed in accessing materials for classrooms.

Creative Commons seeks to further increase access to images, sounds, and data in order to accelerate the knowledge base.

Essential questions form a foundation for original thinking as students build their frameworks using information from a host of sources.