Web Basics for Critical Thinking

My own introduction to critical thinking on the Web was the result of a high school student, Zack, handing in a term paper called, "The Historic Myth of Concentration Camps." Of course, the teacher was horrified by her student's lack of discrimination of a source on the Web claiming that the Holocaust was really a medical response to save the Jews from the rampant spread of typhus caused by head lice. This was 1998, when only a few schools had access to the Web. The school's initial response was to punish the student. What made the event intriguing and even more complicated was the address of the Web site: http://pubweb.northwestern.edu/~abutz/intro. This page no longer exists at Northwestern University, but at the time, it was an individual professor's Web page.

When I had a chance to interview the student and asked why he thought the content to be valid, he understandably told me that the Northwestern University address provided the authority he needed to believe the content to be the latest historic research. What he had never learned in school was how to decode a Web address. The tilde (~) character was all the punctuation he needed to know that the address was a personal opinion and not an official document of the university. He had been sent to the Web to find a source, but he was never taught how to validate and cross-reference his sources. The Web has its own punctuation

and grammar. It is different, but not much more complicated than the grammar of print and paper. Before we send students to the Web for research, they should be prepared to understand the basic rules of how the content is organized, referenced, and validated. Once our students have a basic grounding in the "grammar of the Internet," they can engage in critical thinking.

The rules of research have changed with society's move from paper to digital information. When we were growing up, we were taught to select our reference content from the library. Our range of content was controlled. Stacks of books with authors, titles, and publishers were easy to find; fiction and nonfiction were clearly organized. Digital technology has changed all that. The old controls are gone. Our students can now find information in reference sources, such as the National Archives, that only scholars would have had access to. In addition, they have a direct connection to a global social network beyond our imaginations. Students can write to specialists directly, post their ideas for debate on the blogs of political commentators in London, and get links from professional journals and podcasts from experts. The potential is mind-boggling.

What this shift of control means is that the role of the teacher is more important than ever. Now it is essential that we teach our children the discipline of making meaning from a very complex and constantly shifting global warehouse of information and communication.

To think critically about the information we accessed, we had to learn the grammar and structure of print information. As we all know, it is essential to know the author of a book, how to use the index, the value of checking footnotes, and to cross-reference. These same steps must also be applied to digital information. It is very important to understand that the Internet has a very different way of organizing information than paper technology. In many ways, there are more skills of cross-referencing to master on the Internet than in the world of paper. Once we learn these skills, we are all in much better command of how information and communication influences our thinking and decision making. For example, if the top search result in Google for the search phrase "*global warming*" is owned by the American Petrolium Institute, it would be important to understand that they may have purchased the key phrase, "*global warming*", in order to ensure that you would find their Web site at the top of your results. Can you imagine purchasing keywords in the Dewey Decimal System or buying your way to the front of the card catalogue!

In this first chapter, you will be introduced to the basics about thinking critically about Web information. The basics begin with an understanding of the structure of the Web, its punctuation, and its grammar.

The contents of this chapter are elementary to understanding how the Web works and how it is organized. The purpose is to provide you with some clear definitions and practical ideas to learn and teach the basics of the Internet to your students. It is the first step toward Web literacy and critical thinking. Let the adventure begin.

THE ESSENTIALS

What Is the Internet?

The Internet is a network of many different computers, all over the world, connected together. The network allows computers to talk to each other even though they may be separated by large distances, are made by different manufacturers, and run on different kinds of operating systems.

IP Addresses

The Internet works by allowing Web browsers (software for retrieving Web pages) to call up addresses, much like ordinary mail. These addresses are called Internet protocol (IP) addresses. An example of such an address might be 212.58.240.33.

Are your eyes glazing over? Not to worry. You normally do not see an address written in this numeric form while browsing the Web. Instead you will see text with slashes and dots like this: http://www.cnn.com/. Every IP address also has a corresponding domain name. This makes remembering and navigating to Web sites much easier.

Domain Names

In the CNN Web address, *cnn.com* is the *domain name*. A domain name can have two or possibly three components. The first component is created by the owner of a site. No one can create a name if it has already been assigned to someone else. For example, the rights to use the domain *cnn.com* have already been purchased. Nobody else can use that domain name unless CNN decides they no longer wish to purchase the rights.

The second component is called a TLD, or *top level domain*, and is designated for certain groups or categories. Examples of these categories are *.com* for commercial, *.gov* for government, and *.edu* for educational sites. If navigating to a site that is hosted in another country there will be an additional extension, called a country code. For example, *.uk* refers to the United Kingdom.

Component one examples	Component two examples	Country code examples
nike	.k12	.au (Australia)
cnn	.com	.ca (Canada)
mnh.si	.edu	.ch (Switzerland)
endangeredspecies	.ac	.cn (China)
nfl	.mil	.de (Germany)
nasa	.org	.es (Spain)
travel	.gov	.et (Ethiopia)
	.net	.fr (France)
	.sch	.gr (Greece)
	.biz	.ie (Ireland)
		.in (India)
		.iq (Iraq)
		.il (Israel)
		.it (Italy)
		.jp (Japan)
		.mx (Mexico)
		.nz (New Zealand)
		.uk (United Kingdom)
		.us (United States)
		.za (South Africa)

When you put all the components together you get domain names that look like these:

sahistory.org.za

kiwirecovery.org.nz

culture.gr

tv-tokyo.co.jp

Many Web sites contain two components, a word and an extension (*novemberlearning.com*), but some contain a third component (support .microsoft.com). This third component is a *subdomain*. A subdomain always has a dot separating it from the other components. In the previous example, *support* is the subdomain.

Buying Domain Names

People often select domain names very carefully. In essence, they represent the Web site to the outside world. Typically people want a domain name that describes who they are, such as adidas.com. At times, however, people use their domain name to manipulate and hide the true purpose of

their site. For example, MartinLutherKing.org is a site published by a white supremacist group dedicated to the abolition of Martin Luther King, Jr., Day. You might not assume that by looking at the domain name, but further research will quickly show that this site is actually owned by an organization called Stormfront, which promotes white pride.

For Students—What's in a Domain Name?

A California-based nonprofit organization named ICANN currently manages the assignments of Internet addresses. The rights to a domain name are purchased from registration companies. Register.com and EasyDNS.com are examples of two companies that have the commercial licence to sell you a Web address. You can go to either of these sites, or many others like them, to search any domain name you wish in order to see if it is available for purchase.

For example, *harrypotter.com* was purchased by the film company, Warner Brothers. The domain *nike.com* is being used by the sporting goods company, Nike. In many ways, selecting a domain name is a way for Web site owners to advertise, but for others, it's a way to manipulate and draw you in. For example, the Web address http://www.martinlutherking.org/ is not owned by a nonprofit group called the Martin Luther King Organization. As we mentioned before, it is owned by a white supremacist group promoting white pride worldwide and called Stormfront.

URLs

Another useful bit of Internet jargon is *URL*, which is simply another term for Web address. URL stands for Uniform Resource Locator.

World Wide Web

Most URLs begin with *www.*, which stands for *World Wide Web*. The World Wide Web is a collection of billions of Web pages stored on computers called servers. These pages can contain text, graphics, video, and sound. As with a catalogue or book, these pages usually relate to a common theme or subject. Most are written in a computer language called Hypertext Markup Language (HTML). The good news is you don't need to know HTML in order to read the Web; it works in the background, organizing the presentation of the page.

When you type a URL into your Web browser and hit enter, the browser sends a request to the server that stores the page. The server then sends the page to your browser and it appears on your computer screen.

Web Browsers

A browser is a computer program that lets you *browse* the Internet for information. It retrieves data from remote servers and displays Web pages. Some popular browsers are Internet Explorer, Netscape Navigator, Safari, and Firefox.

Home Pages

When you first type a domain name into your browser, the first place you usually arrive is the site's *home page*. The home page can act like an index or the front cover of a book or magazine, linking to further information. It may contain links to other pages on the same site, or pages to other Web sites.

√ Try This

Do not be surprised if you type in a URL and are redirected to another address that looks far different from the one you have entered. Chances are the URL is *forwarded*, meaning it points to another address. Companies often have several addresses that all lead to the same site. For example, if you enter *www.harrypotter.com* into a browser, you will be redirected to this page: http://www.harrypotterorderofthephoenix.com/. Try it and see.

Links

Links are a powerful concept. They enable you to easily surf the Web and navigate through related sources of information with split-second connections. For example, you can click on a map in a Web site and instantly be transported to a video camera that shows that part of the world in real time. To the knowledgeable user, links are a powerful research tool; they empower you to harness information and quickly solve problems. Links can also be enormously distracting. Within seconds, you can be led to inappropriate or misleading material. Teaching students how to tame the power of links is an important skill.

Links are usually underlined, highlighted, or represented by a graphic. In most browsers, by moving a cursor over a link, the cursor arrow will turn into a hand and a URL will appear in the status bar at the lower left of your browser.

√ **Try This**

Go to http://www.thebritishmuseum.ac.uk and rest your cursor over several of the links. Look to see how your cursor changes and where the URL appears on the lower left of your browser. This is a validating trick we will refer to later.

EXPLORING THE GRAMMAR OF THE INTERNET

Michael's Story

I have shown sixth grade social studies classes the "Victorian Robots" site on several occasions. It's a historical site about robots built in the Victorian era. You see pictures of a robot with Pancho Villa and at various historical events. It's very clever. (Similar to Forrest Gump meeting with President Kennedy.) As I go through the links with students, show the pictures, and ask them what they think, the majority are believers. The photographs are very convincing. I even read that historians have been fooled by this site. It's fascinating to me that not one of my students has ever commented on the URL. It's not until I point it out and show them the home page to see who has published the information that they realize they've been tricked. Reading a Web address is totally off their radar—definitely not something they think about. Yet, it is so simple, like reading the title of a book.

We spend a great deal of time teaching students how to find print information in a library—it's just as important to teach them how information is organized on the Web. Knowing a thing or two about the architecture of a Web address is crucial. All those dots and dashes in a URL are meaningful. They are an important part of the grammar of the Internet. Just as a number or letter on the spine of a book in the library is important—so is the grammar of a Web page.

Reading a Web address is often essential to establishing the authenticity of a Web site. A URL can sometimes tell you plenty about a site, or in some cases, nothing at all.

How to Read a URL

Any given URL can provide you with a snapshot of how Web pages within that site are organized. Along with the domain name, a URL describes

specific folders, servers, companies, countries, and communication methods. Sound confusing? It's not really. Here are some examples.

Example 1: http://www.moma.org/

This URL from the Museum of Modern Art is the home page of the site. In the domain name, *moma.org, moma* refers to Museum of Modern Art. The extension, *.org,* refers to an organization. Be aware. Organization is loosely defined. Anyone with a credit card can purchase a Web address with a .org extension.

Example 2: http://www.moma.org/education/

This URL leads to a Web page that includes the same domain name, but is deeper in the moma site. There can be thousands of pages on a Web site. Each slash (/) in a URL represents another level deeper, like a folder within a folder.

Example 3: http://www.sandiegozoo.org/ teachers/classroom_activities.html

Some really long URLs will have many forward slashes. An example is this page from the San Diego Zoo. Each forward slash on this URL represents one level deeper into the site. In this example, *classroom_activities .html* is a file in the *teachers* folder, and *teachers* is a folder within the site sandiegozoo.org.

√ Try This

- Web addresses are read left to right.
- Unlike in books, there are no page numbers. The way you find a specific page on a site is to have the right address that points to the one page you are looking for.
- There are no spaces in URLs.
- Slashes are always forward (/).

Truncating a URL

What's nice about the structure of URLs is that you can check out the page or level above the one from which you started. It can be a great trick when validating information. Truncating is done by clicking at the end of a Web address and deleting all characters up to the previous left slash. Each time you delete to the previous slash, you move up a level in the organization

of the site. You can delete right to left until you finally end up with just the domain name—which is generally the home page of a site.

√ Try This

Truncate this URL. Start with the top address and remove one level at a time:
http://www.sandiegozoo.org/teachers/classroom_activities.html
http://www.sandiegozoo.org/teachers/
http://www.sandiegozoo.org/

Victorian Robots

A home page can sometimes give you perspective about a site or help you find more information. As Michael pointed out in his story, it can also be a validating tool. If you are ever concerned about the quality of information on a site, try looking at its home page. Just as you might judge a book by its cover, you can sometimes judge a Web site by its home page.

For Students—Victorian Robots

This site is an excellent example to use with students when demonstrating how to truncate a URL to find out more information about the authenticity of Web site information. Try it with *http://bigredhair.com/robots/index.html.*

Might your students also believe that a Victorian robot spent time with Pancho Villa and fought in World War I, and that the photographs are authentic? Probably not after they see the home page.

For Students

This exercise might be a good starting point for younger students when introducing some of the concepts introduced in this chapter. Here are two other popular sites to show students and for you to preview. Have students decide whether the two sites are related in any way. If so, how are they related?

Site #1: The Pacific Northwest Tree Octopus (http://zapatopi.net/treeoctopus/)
Site #2: Bureau of Sasquatch Affairs (http://zapatopi.net/bsa/)

Both sites are fictitious, but note they share the same domain name, zapatopi.net, which means they were published by the same person or company. If you truncate the URLs of both sites, you will end up at the same home page.

CONCLUSION

This chapter has introduced some basic vocabulary and essential tenets of the grammar of the Internet. Although some of what you have read may have been elementary, these are the building blocks for critical thinking on the Web and the first steps toward becoming Web literate. Knowing the architecture of a URL and how to truncate and recognize domain names and extensions will be skills referred to throughout the course of this book.

RESOURCES

British Museum (http://www.thebritishmuseum.ac.uk/)

Bureau of Sasquatch Affairs (http://zapatopi.net/bsa/)

CNN (http://www.cnn.com/)

Harry Potter (http://www.harrypotter.com/)

Museum of Modern Art (http://www.moma.org/)

The Pacific Northwest Tree Octopus (http://zapatopi.net/treeoctopus/)

San Diego Zoo (http://www.sandiegozoo.org/teachers/classroom_activities.html)

Victorian Robots (http://bigredhair.com/robots/index.html)

ASSESSMENT

1. What is the Internet?
    a. An assortment of ideas over the Web
    b. A network of many different computers connected together
    c. A server
    d. A Web browser

2. A link allows you to:
    a. Make notes about the information on a Web page
    b. Access a formal reference to an information source
    c. Instantly connect to another Web page

3. What is the home page of a Web site?
    a. The starting point of a Web site, almost like the front cover of a book or magazine
    b. Where a Web author must list his or her credentials
    c. The best page of a Web site

4. What two things happen when you place your cursor over a link?
    a. You return to the home page and back to the domain name.
    b. Your cursor turns into an arrow and the URL of the link appears in the lower left of your screen.
    c. Your cursor turns into a hand and the URL of the link appears in the lower left of your screen.

5. A URL:
    a. Is the same as an IP address, but much easier to remember than a list of numbers.
    b. Is also known as a Web address.
    c. Contains a domain name.
    d. All of the above.

6. Which of the following is NOT an example of a domain name?
    a. nyu.edu
    b. cnn.ext
    c. novemberlearning.com
    d. whitehouse.gov

7. A domain name:
    a. Can sometimes tell you about the Web browser you are using.
    b. May be designed to fool you about the actual content of the site.
    c. Will never contain an extension.
    d. Tells you absolutely nothing about the content of a site—ever.

8. How do you truncate a Web address?
    a. Remove the domain name from the URL.
    b. Remove the *http://* or the *www.* from a URL.
    c. Remove levels from the URLs right to left until you are left with the domain name.
    d. None of the above.

9. What is the purpose of truncating a URL?
    a. To help navigate through a Web site.
    b. To help find the home page of a Web site.
    c. To help find more information on a Web site.
    d. All of the above.

10. Read the URLs below and identify the domain name within each.

    http://www.thebritishmuseum.ac.uk/compass/

    http://educationworld.com/a_tech/archives/interactivity.shtml

    http://www.cnn.com/TECH/

    http://www.shakespeare.com/Poetry/ieindex.html

11. What is the domain name of this URL? http://educationworld
    .com/a_tech/archives/interactivity.shtml
    a. educationworld.com
    b. .shtml
    c. .com
    d. http://

12. Companies often select domain names designed to draw people to their Web site. True or false?

13. Truncating a Web address is not a method of validating Web site information. True or false?

Answer Key: 1. b; 2. c; 3. a; 4. c; 5. d; 6. b; 7. b; 8. c; 9. d; 10. thebritish museum.ac.uk, educationworld.com, cnn.com, shakespeare.com; 11. a; 12. True; 13. False

QUESTIONS FOR EXTENDED THOUGHT AND DISCUSSION

1. If you believe that all students should be Web literate, what is the best strategy for your school or district to prepare students with this skill?

2. What skills should all teachers have to be Web literate?

3. What role should school filtering play in your school district? Who should make this decision?

4. Do you believe the Internet is as big a transformer of culture as the printing press?

5. If yes, what parts of our culture do you believe will be most affected?