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STUDENT EVALUATION OF  
INTERNET RESOURCES

by  
Kathleen Donoghue

A Thesis

Submitted in partial fulfillment of the requirements of the  
Master of Arts Degree in the Graduate Division  
of Rowan University  
May 1, 1998

Approved by

Date Approved May 4, 1998

## **ABSTRACT**

Kathleen Donoghue. Student Evaluation of Internet Resources. 1998. (Under the direction of Dr. Holly G. Willett, Program in School and Librarianship).

This study investigated a means by which high school students were taught to critically analyze information found on the Internet. Many students view the Internet as an information resource and regard what they find there as authoritative. It is necessary for students to develop strategies that will assist them in identifying information that is relevant, reliable, and accurate. In this study, 18 students were provided with sample checklists to use as a guide in evaluating Internet resources. After guided practice in the classroom, each student examined four web sites that were pre-selected by the instructor and varied in characteristic properties. The degree of reliability, quality, and usefulness of the information was determined by each student. Students were successful in developing the evaluation skills necessary to become responsible information consumers.

## **MINI-ABSTRACT**

Kathleen Donoghue. Student Evaluation of Internet Resources. 1998. (Under the direction of Dr. Holly G. Willett, Program in School and Librarianship).

This study investigated a means by which high school students were taught to critically analyze information found on the Internet. The results of the study indicate that students were successful in developing the evaluation skills needed to identify Internet information that is relevant, reliable, and accurate.

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## **Chapter One**

### **Introduction**

#### **Introduction**

Locating useful information from the Internet can be as difficult as finding a needle in a haystack. Skilled researchers learn to make use of the various tools and resources for sifting through an ocean of data for the information they need.

One of the problems of harvesting information from the Internet is that resources tend to vary tremendously with respect to quality, currency, and level of organization. There is no editorial board and no enforceable standard for content. Anyone can publish and distribute information on the Internet and World Wide Web. Therefore information may be out of date, misleading, or just plain wrong.

Library media specialists use a set of criteria to evaluate print items that will be selected into their collection. They also know how to instruct students in critiquing items for use in research projects. However, a new set of standards is needed for evaluating information from the World Wide Web. Users need to

learn to evaluate technical aspects and subject content of a Web page to determine whether it meets their needs.

With the advent of new technology, there is always a new set of skills to be learned. It is imperative that library media specialists provide students with the skills needed to evaluate the accuracy, authenticity, and applicability of information found on the Net. "The challenge is to teach students to become critical Web users and to help them develop the skills they need to choose appropriate information sources" (Symons, 1996, p.107).

Training students to evaluate this new medium means blending media literacy skills with library reference skills. The bottom line is that before accepting information they find on the Internet, students need to verify it as a legitimate source. All too frequently students are apt to believe that information is true because it was found on the Internet (Shrock, 1996).

## **Methodology**

The research phase of this paper involved 9<sup>th</sup> grade high school students being taught the skills necessary in the evaluation of information. Participants from Washington Township High School, in Washington Township, NJ, had hands-on experience in evaluating Web pages using the checklist developed. This tool allowed students searching the Net to identify quality Web sites, and to cite reasons to support their judgments. A 9<sup>th</sup> grade low level science class was used as research subjects, and it was presumed that their overall library



skills were weak. In addition to an insubstantial background in the library, most of the students did not own home computers or have access to the Internet. Despite the limited experience of the participants, the goal still existed:, To create an efficient Internet user who would be skilled in critically analyzing information sources for authority and content.

Students were to illustrate their knowledge of evaluation techniques for Web pages by using actual Web pages as examples. Students were given a list of current Web sites for a topic that the class would be researching. Their mission was to apply evaluation techniques to the Web pages and to determine their degree of reliability and quality.

### **Procedure**

The following represents the lesson plan - or experiment - that was used with the 9<sup>th</sup> grade class (18 students):

The objectives were:

1. To provide materials to students to assist them in learning how to evaluate the informational content of Web resources.
2. To have students realize that Web pages need to be looked at critically and evaluated for accuracy, authenticity, currency, and content.

Materials that were needed included signed copies of "Parent permission letters" and class copies of the "Evaluation Checklist". Also necessary to the

research was a school media center with computers available for access to the Internet.

To begin the study, students were asked to examine a printed copy of a web site. They were then given a checklist and determined the characteristic properties of the site. After this pretest was administered, students were instructed in the classroom on strategies for evaluating information taken from the World Wide Web (using traditional and non-traditional criteria). Checklists were then provided to the students and questions were examined and discussed in class.

Next, students were assigned a topic to be researched - appropriate to the content currently being taught in the classroom. Working in pairs, students were given four Web addresses that related to the assigned topic. These Web sites were selected by the instructor based on their attributes, two were models of a high quality Web page and two had many weak components. Students then evaluated the Web sites using the checklist provided.

Each group of students reported their findings to the class using overhead transparencies of their checklists. Correct and incorrect responses were tabulated by the instructor to calculate the student's findings. As a follow-up activity the students returned to the library to view another Web address (pre-determined by the teacher). Students listed and defined what made the site a valuable source of information, using their critical thinking skills.

## **Definition of terms**

This document will discuss the criteria by which librarians evaluate traditional print information and how these techniques can be used to assess information on the Internet. These criteria include:

1. **Content:** A good site should share meaningful and useful content that indicates, informs, or entertains.
2. **Authority:** The author or publisher of the site should be named and should cite their qualifications for writing on the subject.
3. **Purpose:** The site should have a clear reason for being there and the audience should be able to determine its purpose.
4. **Accuracy:** Information posted at the site should be reliable and free from error. (Kirk, 1997)

In addition to the evaluation criteria for print materials, measures particular to the world of on-line information were examined, such as design and stability of the site. Design of the site means that information should be easy to find and use, and stability refers to the ability of the site to be found again. Information found on sites located on the World Wide Web will often be referred to as Internet resources, Web resources, or Web sites in this paper.

After reviewing much library literature, a checklist was designed to enable high school students to evaluate Internet resources using the above criteria. Some of the sample questions included:

- Is the resource advertising or is it information?
- Is the resource accurate and verifiable?
- Is the resource documented and/or current?
- Who is responsible for the information?

### **Summary**

This research project enabled students to become more familiar and knowledgeable with the Internet and its resources. Students also became more savvy in locating information and more adept in identifying what is valuable to their research.

## **Chapter Two**

### **Literature Review**

“Information is important. But even more important is knowing that the information you have is valid, reliable, authoritative, and pertinent” (Brandt, 1996, p.44). Traditional bibliographic instruction by librarians emphasizes evaluating information. This may seem unnecessary, given that librarians have already filtered the information available in their collections through their selection process. As part of their collection development, librarians have verified the validity and authenticity of their materials through reviews and in-hand examination (Brandt, 1996). Students come to trust that the information they find in such a collection is valid and authoritative.

Unlike most print resources, information obtained from the Internet is mostly unfiltered. There are no required standards or rules to be met before putting information on the Web (Tillman, 1997). Students must be aware that the degree of reliability and quality found on Web pages can vary greatly. So it is important for students to be able to evaluate the information and resources found on the World Wide Web (Symons, 1996).

In the last few years a number of authors have considered applying criteria for the evaluation of resources to the Internet. Generally, they have all

mentioned Katz's *Introduction to Reference Work* as a starting point from which to adapt. Authorship, the publishing body, point of view or bias, knowledge of the literature and verifiability of details, are some of the traditional subjects examined. Criteria for evaluating traditional media also appear on the Internet, as shown in guidelines published by the Cornell University Library.

Of these criteria, "authority is of particular concern" (Alexander & Tate, 1997, p.1). "A strength - but also a weakness - of the Internet is that almost anyone can put anything online. In doing so, however, they bypass many of the benefits of traditional publication; issuance by an authoritative source, editorial or peer review, evaluation by experts" (Brandt, 1996, p.44). The ease of constructing Web documents results in information of the widest range of quality, written by authors of the widest range of authority. Excellent resources reside amongst the worst of resources. Symons (1996) believes the role of the librarian is to assist users to be critical of sources. Students must be wary of what they find: They must look for an author and decide if the source is credible.

Accuracy of information is another concern on the Internet. Information must be examined to determine how reliable and free from error it is. Sources should be cited for any factual information given so it can be verified by another source. Shrock insists that "before students accept any information they find on the Internet, they need to verify it with a second source" (1996, p.12).

Currency, in theory, should be where Internet sources have an advantage over print sources. However, Grassian and others point out that it can be

difficult to determine the original date or most recent update of Internet resources (1996). Many sites include a date of last revision, but many do not.

While most authors agree that traditional criteria apply, there are unique aspects to the Internet that require some new evaluative criteria (Tillman, 1997). The following challenges presented by Web resources are named by Alexander & Tate (1996): 1) The quality of pages linked to the original Web page may vary. 2) Web pages may move or disappear without notice. 3) Software requirements may limit access to Web information. 4) Web pages may be retrieved out of context by a search engine. 5) Web pages are susceptible to both accidental and deliberate alterations. 6) The distinction between advertising and information can become easily blurred (Alexander & Tate, 1996).

To assist students in evaluating resources available through the Internet, checklists have been developed. Forms for evaluating Web sites exist online from the Canisius College Library, the Rutgers University Library, the UCLA Library, the Widener Library at Harvard, and others, including public libraries. Criteria from these checklists were assimilated to produce a tool for high school librarians to apply to their students.

Included with this evaluation tool is a guideline for citing online sources (see Appendix B). The latest MLA Handbook contains citation information for electronic sources, as do several Web sites (Shrock, 1996). Listing sites in a bibliography will make students aware that their work can be checked for veracity.

## **Chapter Three**

### **Methodology**

Educators want students to react to information, not to simply retrieve it. Teachers can assist students in developing their higher level critical thinking skills by having them question content and sources found on the Internet. This study examined a means by which students can be taught to become critics of information found on the Internet.

#### **Participants**

In this study, a class of ninth grade science students was taught how to critically analyze and evaluate information found on World Wide Web sites. The class was made up of 18 students from a large suburban New Jersey high school. The community has a majority of middle-income families living in single family housing. Of the students in this study, only four had computers in their homes, and only one student had access to the Internet.

The class was chosen for this study for three reasons. First, they had limited access to the Internet, and so assessment of their evaluation skills would be a truer indication of the success or failure of the researcher's methods.



Second, they were a homogenous group of students, representing low-achievers or non-college-bound students. And third, the content of their course allowed for more flexible means by which to bring technology and research into their curriculum.

### **Materials and Instruments**

Internet access at the high school only occurred recently and was only available in the school's media center. Currently 12 computer workstations with Internet access were online and were open to students accompanied by a teacher.

Due to the limited number of accessible stations, teachers have been advised to sign up in advance with their classes. Also, they have been requested not to sign up for all of the stations at once, leaving space for other instruction to occur.

Therefore students in this project worked in teams of two or three per station. An acceptable use policy for the Internet was to be supplied by the school librarian (approved by the Board of Education). Each student was required to sign and have a parent or guardian sign this statement before the study began. Students also received a letter stating that their participation in this study would be confidential and would have no bearing on their grade (see Appendix A).

After reviewing many evaluation checklists available in research journals and on-line resources, a checklist was developed for this study. It was pieced together from evaluation surveys posted by a number of authors (Alexander and Tate, 1997; Grassian, 1996; and Shrock, 1996). The criteria was formatted into a checklist that would be easy to use and understand for the students who would be evaluating web sites (see Evaluation Checklist in Appendix B).

### **Limitations**

There were a few limitations involved in this study. First, the size of the population was too small. Eighteen students does not represent a large enough sampling. Second, students worked in pairs at each computer workstation. This gave students an unintended opportunity to discuss the evaluation criteria, and while this may help to increase their understanding, it might have distorted the results. Finally, the time frame that was used to teach the lesson was too short. The entire project lasted only a week due to curriculum restraints and therefore the lesson on evaluation criteria was not as thorough as it should have been.

### **Procedure**

The project began with a student evaluation of a Web site taken from the Internet. Before the lesson was taught , students were asked to judge a printed copy of a Web site using the checklist that would be discussed in the following day's lesson (see Appendix B). This allowed the teacher to determine where

the strengths and weaknesses lay in students' evaluation techniques and served as a pre-test.

Prior to the visit to the school media center, the class discussed methods for accessing the Internet and strategies for evaluating what would be found there. Topics included were:

- 1) The URL or address may indicate the nature of the site.
- 2) Who is the author or the sponsor of the site?
- 3) What is the purpose of the site?
- 4) The design and the stability of the site are indicators of quality.
- 5) The content of the site should make it useful, entertaining or informative.

Checklists for evaluation of Internet resources were distributed to each student (see Appendix B). Questions and explanations for responses were discussed in the classroom. To check for understanding, students evaluated their textbook together in class. They then discussed how books, magazines and other media are selected by a librarian for the media center's collection. Students should be aware that the need to evaluate information from Web sites stems from the fact that there are no selection criteria for information to be put on the Internet. Many reputable sites and many unreliable sites reside side by side. Equal access is available, so this unbiased medium will voice the opinions of Ivy League professors, as well as your next-door neighbors (Caywood, 1997).

After the classroom discussion on evaluation of resources, students were given a library research sheet (see "Chapter 9 - Light" in Appendix B). This worksheet contained questions from the appropriate area of the curriculum to be researched on the Internet and was also used during the pretest. In this study, the lesson was tied to a unit in their textbook on light. Students were presented with the scenario that they were doing research on this subject. Their goal was to determine the usefulness of the information found at various Web sites in relation to their research needs.

Students were issued a list of Web addresses that had already been viewed, selected, and approved by the researcher (see Appendix B). Working with their team, students were to evaluate four of the various sites at the computer workstations in the library. The Uniform Resource Locator (URL) for each Web address was typed in by the students so they would become familiar with accessing information on their own. Free searching for Web sites was not done in this study due to a lack of time and access to the computer facilities. Although searching the Internet for resources and information is indeed a valuable skill, the focus of this study remained on the evaluation skills of the students once they have accessed the information.

Students had three days in the library for the activity. During this time students worked with their teammates to evaluate the assigned Internet addresses. Their mission was to assess the value of the site for the subject being researched. Specific directions for the assignment were given in the

Student Instruction Packet (see Appendix B). Each student completed their own evaluation on each of the four sites, and although they were allowed to discuss the criteria with their partner, judgment of each of the criteria was done individually. Once the evaluations were completed, the class compared and contrasted their checklists. Student discussions led to a class decision as to the site deemed “most valuable resource.”

## **Chapter Four**

### **Results**

In this study 18 high school students were asked to evaluate four web sites on the Internet and were to determine their degree of reliability and quality, as well as the usefulness to the purpose of a hypothetical assignment. To get them started students were asked, "If you needed to do a report about our topic, would you have found this site helpful?" One student made the comment that they didn't know how to tell if a site was valuable or not . . . until they had the checklist. The list was "like a tool " they could use to help them make their decisions.

Seventy-two evaluation checklists were examined by the researcher. Student responses were categorized as correct or not correct based on the information contained in each site. Their results were compared to the initial checklist that was used in their pretest to evaluate a web site. For two days they discussed how resources are evaluated and the checklist was examined. The Evaluation checklist was divided into six general areas: content, authority, purpose, accuracy, design and stability, and a narrative evaluation.

## **Content**

Table 1 provides the results of the pretest / posttest comparison of student responses to evaluating content. In the category of content, the results showed that students improved in their ability to perform a content analysis. The first question in this category asked students to decide if the title of the site indicated the site's content. At the start of this study, more than half of the students (67%) were able to respond correctly. However, after working through this project, 96% were able to correctly identify if the title matched the content. The question that asked students to determine when the document was created showed an improvement in correct responses from 78% to 94%.

A problem was encountered with the question "Is the information current?". Unfortunately, the boundary dates for what was to be considered current were not set at the start. As a result, students used their own boundaries which surely varied their responses. So, although one could say that student responses improved in the percentage answered correctly (64%), it should also be noted that a large percentage answered incorrectly (33%).

In the pretest phase, when students were asked if the information was useful to their project, they were weak in their ability to answer correctly. Originally, we had as many wrong answers as right answers. However, the rise to 88% correct responses indicate that students were better able to make decisions on the worth of the information found at the site. When asked if the

site contained enough information to make it worth the visit, 79% gave correct responses, up from 44%.

Table 1

Student Responses to the Evaluation of Content (n = 18)

Criteria	Pretest			Posttest		
	Correct Response	Incorrect Response	No Answer	Correct Response	Incorrect Response	No Answer
Does the title indicate the content?	67%	0%	33%	96%	4%	0%
When was the document created? (date indicated?)	78%	6%	17%	94%	6%	0%
Is the information useful for your purpose?	44%	44%	11%	88%	10%	1%
Is the information current?	39%	28%	33%	64%	33%	3%
When was the page last updated? (date indicated?)	28%	56%	17%	84%	13%	3%
Are links provided to more information on the topic?	39%	61%	0%	92%	7%	1%
Is there enough information at this site to make it worth the visit?	44%	11%	44%	79%	21%	0%
Is the content of the site easy to read and understand?	78%	0%	22%	100%	0%	0%
Is a bibliography of other resources included?	22%	72%	6%	56%	44%	0%

Posttest information indicates that students were able to identify a sites links with a success rate of 92% (up from 39%). However, when students were asked to decide if links were provided by the site, the pretest information may not be useful. The site evaluated for the pretest was on a photocopied black and white page, so each student would have a copy to work with in the



classroom. Links are often in boldface, or represented by a different color text on the monitor, so it might have been easy to miss links on the pretest. (Also, the cursor changes status from an arrow to a hand icon when over a link.)

For the question “Is the site easy to read and understand?”, students responded correctly 100% of the time. This was the only area in the category as well as the entire checklist where no one gave incorrect responses. Perhaps this is due to the fact that the sites were pre-picked by the instructor and the appropriate grade level was kept in mind.

A disappointing area to note was that the question asking “Is a bibliography of other resources included?”, demonstrated a weakness on the students’ behalf. This area showed the poorest correct responses in the entire study (56%). When discussing this after the research was complete, it was found that students could not define the term “bibliography”.

### **Authority**

In the category of authority, students again demonstrated overall success in their ability to correctly identify just who it is that is posting the site. All five areas in this category showed an improvement. These results are showed in Table 2. When asked to determine “who created the page?”, students gave a correct response 67% of the time. The percentage might have been higher, but on one of the web sites it was not clear who actually put up the site, unless you went back to a previous link. As many students did not list correct answers for

that particular site, these results may not be true indicators of students' abilities to identify site authors. "Are the author's qualifications clearly stated?", shows the students made good decisions 75% of the time (up from 44%).

Eighty-six percent of the time students could correctly identify the organization affiliated with each site, compared to 28% from the pretest. Sixty-one percent of the students felt that the domain (in the address) influenced the decisions they made on the evaluation form. This was a dramatic rise from 6% during the pretest. Later, most students admitted to never having heard the word "domain" before.

Table 2

Student Responses to the Evaluation of Authority (n = 18)

Criteria	Correct Response	Pretest		Correct Response	Posttest	
		Incorrect Response	No Answer		Incorrect Response	No Answer
Who created the page? (Do they cite the name?)	28%	22%	50%	67%	32%	1%
Is an organization listed?	28%	50%	22%	86%	11%	3%
Are the authors qualifications stated?	44%	33%	22%	75%	25%	0%
Does the domain influence your evaluation?	6%	33%	61%	61%	33%	6%
Can you make comments or ask questions?	56%	33%	11%	92%	7%	1%

Finally, when asked if the site provided the user with a way to make suggestions or ask questions, 92% were able to decide correctly, up from 56% in

the pretest. None of the sites evaluated allowed the user to ask questions or make suggestions. Only 7% of the time students did not realize that.

## Purpose

Decisions involving the purpose of a web site, reported in Table 3, showed results indicating an increase in understanding occurred. Two of the four sites explicitly stated their reason for being, the other two did not. Although the percentages increased in both subdivisions in this category, the numbers were not as high as expected. Students were asked to determine if the purpose of the site was to inform, persuade, educate, or sell. Much of the information from the site was self-evident. With correct responses limited to 81%, this was a red flag to go back and discuss with the class.

Table 3

### Student Responses to the Evaluation of Purpose (n = 18)

Criteria	Correct Response	<u>Pretest</u>		Correct Response	<u>Posttest</u>	
		Incorrect Response	No Answer		Incorrect Response	No Answer
Is the purpose of the page indicated?	39%	33%	28%	84%	15%	1%
The main purpose was to... (student indicates purpose).	44%	0%	56%	81%	13%	6%

## Accuracy

As Table 4 indicates, the student responses in the category regarding accuracy did not all show improvement. One subdivision actually reported a decrease in the number of correct responses. To the question “Is the source of information provided?”, 67% of the students answered correctly in the pretest, but only 61% were correct in the posttest. This was worrisome as it indicated a failing in the lesson. Students were either unable to identify a bibliographic source or reference cited by the web site, or they misunderstood the question. The majority of wrong answers were from students who believed sources were given when in fact they were not. This indicated another area to be reviewed.

Table 4

### Responses to the Evaluation of Accuracy (n = 18)

Criteria	Correct Response	<u>Pretest</u> Incorrect Response	No Answer	Correct Response	<u>Posttest</u> Incorrect Response	No Answer
Does the information appear biased?	6%	28%	67%	65%	28%	4%
Is information separated from opinion and advertising?	39%	28%	33%	80%	14%	6%
Is information valid and well-researched?	22%	50%	28%	80%	14%	6%
Is a source of information provided?	67%	33%	0%	61%	36%	3%
Are you positive information is true?	11%	67%	22%	82%	18%	0%
Do you know a way to prove information is true?	6%	17%	78%	94%	3%	3%

When responding to the question "Does the information appear biased?", many students had no answer in the pretest. During class discussion, students admitted that they were not sure what "biased" meant. In the posttest, their understanding of the term was revealed by a 65% correct response rate (up from 6%).

Students were able to separate the information at a web site from the advertising and opinions. They also performed well when asked to determine if the information provided was valid and well-researched. In both areas they scored above an 80% correct response rate.

Students demonstrated fine decision making skills when they were asked to determine, "Are you positive the information is true?". Eighty-two percent in correct answers show that the students have learned to be skeptics. Even better is that 94% know that to prove the information given is correct, they must find it in another source.

### **Design/Stability**

The next category evaluated was in the design and stability of the Web site. Table 5 indicates that this area showed an overall improvement in scores posted by the group. "Did the page take a long time to load?" (only one site took longer than 10 seconds), was a question answered correctly by students 86% of the time. However, it must be noted that on the pretest, a printed copy of the

Web site was used, so 100% of the pretest responses showed no answer and so no comparison is possible.

Ninety-six percent of the students were successful in recognizing if information at the site was easy to find and use. In fact, there were no incorrect responses in this category, leaving 4% with no answer.

Students showed improvement in their ability to correctly determine if a site had spelling or grammatical mistakes (79%), compared to 61% in the pretest. With a 72% correct response rate to the question, “Do graphics serve a purpose other than decoration?”, students noted that many graphics represented links or were educational in nature. Finally, 86% of the time, the group gave correct responses for “Are links visible and well-explained?”. This was up from 39%, which indicated confidence in their ability to identify a site’s links and predict its nature.

Table 5

Student Responses to the Evaluation of Design and Stability (n = 18)

Criteria	Correct Response	Pretest Incorrect Response	No Answer	Correct Response	Posttest Incorrect Response	No Answer
Does the page take too long to load?	0%	0%	100%	86%	8%	6%
Is information at the site easy to find and read?	78%	22%	0%	96%	0%	4%
Any spelling or grammar mistakes?	61%	28%	11%	79%	10%	11%
Are links visible and well explained?	39%	39%	22%	86%	11%	3%
Do graphics serve a purpose other than decoration?	50%	33%	17%	72%	24%	4%

## **Narrative Evaluation**

Finally students were asked to provide a written summation for each web site that they evaluated. Using the Evaluation checklist to review all the data they collected, they were to explain why the site would or would not be a valid source for their purpose. Although many of their answers were brief, most students were able to state exactly why they would or would not use the site. This area, more than any other category, showed the level of understanding hoped for. Here students recognized that “the information at this web site was valid, but it certainly did not suit my purpose.” Another student wrote, “the information they say is here (at the web site) wasn’t really - it was bits and pieces and a few pictures, but mostly it was an advertisement for their company!”

In the class discussion that followed the library activity, students were all able to agree on the “best site” for their research topic. They felt that one site offered more information on their subject and that its quality was good, based on their checklist data. It should be pointed out that students commented that some of the sites were more challenging than others to evaluate. For example, one site indicated it was written for 5<sup>th</sup> and 6<sup>th</sup> grade students, and the class felt this site was easy to navigate and comprehend. Another site was clearly an advertisement for a company that designs equipment for a highly educated consumer, and students felt the information here was “over their heads” and hard to decipher.

## **Chapter Five**

### **Summary, Conclusions, and Recommendations**

#### **Summary**

The purpose of this project was to develop a teaching strategy that would enable students to effectively evaluate information found on the Internet.

Traditionally, students locate information from printed sources that have already been evaluated and selected by school and public librarians. These sources have been scrutinized and accepted for publication based on their merits.

However, information that has been posted to the Internet often bypasses traditional means of publication, so anything can and does end up on the World Wide Web. Students need to be aware that “quality control” does not exist on the Internet and therefore must be imposed by the user.

In this project, a checklist for evaluation of Web sites was created to introduce students to information assessment. This enabled students to question content and sources found on the Internet. The checklist was a model to help students develop skills to think critically about information presented through the Internet. The lesson equips students to take responsibility for their own learning.



## **Conclusions**

The goal of this project was to have students effectively evaluate information found on the Internet. They were to identify criteria that would be helpful in defining the quality of information posted at each Web site.

Students were successful in all areas of evaluation of information. In a comparison of student outcomes from the pretest to the posttest, overall improvement in correct responses occurred in almost every single category in every area of evaluation.

From a teaching standpoint, the lesson was successful in three major ways. First, students were introduced to Internet resources. Many of the participants had had little opportunity to become familiar with Web searching, and this project provided a technology experience. Second, students were made aware of the diverse range of quality of information available on the Internet. Comprehension of this fact produced information skeptics. Finally, students were given a model for analyzing information which enabled them to become critical consumers of information. This created a savvy student who can independently determine the value of a resource posted on the Internet.

## **Recommendations**

There are a number of suggestions to be made that would have improved the quality of this study. First, the population size should have been larger.

Ideally, more classes of the same subject and level would be used to increase the number of students tested. Second, if possible, each student should have their own computer workstation. This would discourage any conferences between students, which could have skewed the results. A third improvement would be to increase the amount of time spent on teaching the evaluation method. As was mentioned earlier, the science curriculum must be covered and so added time to cover evaluation criteria was at a minimum. To improve the results, the time frame in which the lessons were taught should be lengthened. Perhaps a library media specialist would be a better choice for teaching this unit as this applies to the library curriculum.

### **A Final Note**

Student feedback on this project was very satisfying. Without exception, the students enjoyed the activity and felt it was important in three ways. First, it increased their ability to locate and evaluate information. Second, they liked the idea that they were contributing to a research project where their results had meaning. Third, the school librarian led the class to believe that its performance would be monitored and decisions regarding school policies and Internet use might be determined from her observations.

Finally, the students repeatedly announced their desire and enthusiasm to return to the library for more research work on the Internet. They hoped to search for sites on their own to see who can find the “best site”. It certainly

brought home the message that when learning is meaningful to the student,  
education can be exciting!

## References

- Alexander, J. & Tate, M. (1997). Teaching critical evaluation skills for World Wide Web Resources. *Computers in Libraries*, 16 (10), 49-54.
- Brandt, D.S. (1996). Evaluating information on the Internet. *Computers in Libraries*, 16 (5), 44-47.
- Caywood, C. (1997). Library selection criteria for WWW resources. [On-line], Available: <http://www.infi.net/~carolyn/criteria.html>.
- Emery, G. (1997). Checklist for evaluating Web Sites. [On-line], Available: <http://www.canisius.edu/canhp/canlib/webcrit.htm>.
- Grassian, E. (1996). Thinking critically about World Wide Web resources. [On-line]. Available: <http://www.library.ucla.edu/libraries/college/instruct/critical.htm>.
- Morville, P.E., Rosenfeld, L.B., & Janes, J. (1996). *The Internet searcher's guide: Locating information, people, and software*. New York, NY: Neal-Schuman Publishers, Inc.
- Quesada, A. and Summers, S.L. (1998) Literacy in the CyberAge: Teaching Kids to be Media Savvy. *Technology & Learning*, 18 (5), 30-36.
- Richmond, B. (1996). Ten C's for evaluating Internet Resources. [On-line], Available: <http://www.uwec.edu/admin/library/10cs/html>.
- Schrock, K. (1996). It must be true. I found it on the Internet. *Technology Connection*, 2 (9), 12-14.

- Sweet, M.C. (1997). Smart surfing. *Smart Computing*, 8 (9), 82-83.
- Symons, A.K. (1996). Intelligent life on the Web & how to find it. *School Library Journal*, 42 (3), 106-109.
- Tillman, H. (1996). Evaluating quality on the Net. [On-line]. Available:  
<http://challenge.tiac.net/users/hope/findqual.html>.

APPENDIX A

Dear Parent or Guardian,

In several weeks I will be taking your son/daughter to the school library to conduct research using the Internet. The students will be assigned a topic related to our science curriculum and will be asked to locate information pertaining to that subject. They will be using Web sites on the Internet that I have previously selected, viewed, and approved. Students will be asked to evaluate these pre-determined sites for their usefulness to their research.

I will be using the student evaluations of the Internet resources in a study I am conducting as part of my Master's program at Rowan University. While all students will participate in the classroom activities, their participation in the study is voluntary and will not affect their grades. I am asking for your permission to have your son/daughter's responses included in this study. Student identifications will remain confidential.

Please sign the form below and return it as soon as possible. If you have any questions or comments, please contact me at 589-8500. Thank you for your cooperation in this matter.

Sincerely,

Kathy Donoghue  
Washington Township-  
H. S. Science Department

Holly Willett  
Library Education Advisor  
Secondary Education  
Rowan University  
(609) 256-4759

Parent/Guardian Signature \_\_\_\_\_  
Date \_\_\_\_\_

## APPENDIX B

### **Student Instruction Packet**

On the following page is a list of Uniform Resource Locator (URL) addresses. Each of these addresses will take you to a World Wide Web site on the Internet. At your computer terminal, you will type in a URL and will be connected to that site.

As you are typing in the address, be aware that what is in the Web site's address can often indicate the nature of the site. Sites from commercial businesses usually include ".com", federal government sites end in ".gov", K-12 schools include "k12" in the address, and college and university sites often include ".edu". Sites from non-profit organizations often include ".org". A site with a tilde ( ~ ) in the address usually indicates that this page is maintained or created by an individual, rather than representing an organization, a business or a school.

Your mission is to analyze the information you find at each Web site. At the address given, you are to examine the site carefully. You must first decide if the information fits your needs. Will it help you to answer any of the questions posed in each unit of our chapter on Light ? (see the attached page )

Identify each unit for which the information may be appropriate and place a check mark in the grid to which it applies. For example, if the site contains facts about the speed of light, circle the appropriate letter for the section 9-2, "How do light waves travel?"

Next, use the Evaluation Checklist (see attached) to help you decide if you are looking at a quality Web site. The selection criteria will help to guide you in measuring the worth of each site. Be advised that every site does not need to meet every listed criterion on the checklist, but the more of them a site does meet, the more likely it is a valuable resource.

Perform an evaluation for each of the Web addresses listed. Use an Evaluation Checklist with each site but only the primary site listed. Due to a lack of time, we will not attempt to evaluate the sites that are linked from the primary site.

Back in our classroom, we will discuss the reliability, accuracy and worth of the information found at each Web site. We will compare our checklists and determine which of the sites merits the title "most valuable resource".

## Evaluation Checklist

URL of Web page you are evaluating:

http:// \_\_\_\_\_

Name of the Web page you are evaluating:

\_\_\_\_\_

**Content:** A good site will share meaningful and useful content that educates, informs or entertains.

Is the title of the page indicative of the content?      YES or NO

When was the document created? \_\_\_\_\_

Is the information useful for your purpose?      YES or NO

Is the information current?      YES or NO

When was the page last updated? \_\_\_\_\_

Are links provided to more information on the topic?      YES or NO

Is there enough information at this site to make it worth the visit?      YES or NO

Is the content of the site easy to read and understand?      YES or NO

Is a bibliography of other resources included?      YES or NO

**Authority :** A good site will indicate who put up the material or is sponsoring the page.

Who created the page? \_\_\_\_\_

What organization is the person affiliated with? \_\_\_\_\_

Are the author's qualifications for writing on this topic clearly stated?  
YES or NO

Does the domain (i.e. edu, com, gov) of the page influence your evaluation of this site?      YES or NO

Does the author provide a way for users to make comments or ask questions?  
YES or NO



**Purpose:** A good site will identify it's reason for being there.

Is the purpose of the page indicated on the home page? YES or NO

Is the main purpose of this page to entertain, persuade, educate or sell?  
Circle those that apply.

**Accuracy:** A good site will provide reliable information that is free from bias.

Does the information appear biased? YES or NO

Is the informational content clearly separated from the advertising and opinion content? YES or NO

Does the information appear to be valid and well-researched? YES or NO

Is the source of information provided? YES or NO

Are you positive that the information is true? YES or NO

What can you do to prove that it is true? \_\_\_\_\_  
\_\_\_\_\_

**Design and Stability:** "A good site has personality and strength of character."

Does the page take a long time to load? YES or NO

Is the information on the site easy to find and easy to use? YES or NO

Is the information free of spelling, grammatical or typographical errors?  
YES or NO

Are there links that are clearly visible and explanatory? YES or NO

Do any graphics present serve a purpose other than decoration? YES or NO

**Narrative evaluation:** Looking at all of the data you have collected while evaluating the site, explain why or why not this site is valid (or not) for your purpose. \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

## Chapter 9 - Light

**Directions:** If a site applies to one of the following sections, meaning it contains information that relates to the unit subject - circle the site letter. If the site does not apply, make no marks.

<u>Unit #:</u>	<u>Unit title:</u>	<u>Web sites:</u>			
9 - 1	What is light? -light /photons /rays	A	B	C	D
9 - 2	How do light waves travel? -speed /frequency / wavelength	A	B	C	D
9 - 3	What are sources of light? -luminous /illuminated	A	B	C	D
9 - 4	How do we see? -parts of the eye	A	B	C	D
9 - 5	What is color? -prisms /rainbows	A	B	C	D
9 - 6	What is photosynthesis? -plants use of light	A	B	C	D
9 - 7	What is reflection? -light bounces /mirrors	A	B	C	D
9 - 8	What is refraction? -lenses - concave /convex	A	B	C	D
9 - 9	What is the electromagnetic spectrum? -X-rays / UV light /infrared / radio /TV waves	A	B	C	D
9 - 10	What are lasers? -uses of laser beams	A	B	C	D

### Web Addresses:

- A) <http://www.beakman.com/glasses/eyeglasses.html>
- B) <http://nyelabs.kcts.org/nyeverse/episode/e27.html>
- C) [http://curry.edschool.Virginia.EDU/murray/Light/How\\_Light\\_Works.html](http://curry.edschool.Virginia.EDU/murray/Light/How_Light_Works.html)
- D) <http://www.li.net/~Stmarya/stm/lights.htm>
- E) [http://www.exploratorium.edu/publications/Snackbook/blue\\_sky/  
blue\\_sky.html](http://www.exploratorium.edu/publications/Snackbook/blue_sky/blue_sky.html)
- F) <http://www.aardvark.on.ca/space/html/telescope.html>
- G) <http://www.opticalres.com/kidoptx.html>
- H) <http://www.geom.umn.edu/education/calc-init/rainbow/>
- I) [http://illusionworks.com/html/hall\\_of\\_illusions.html](http://illusionworks.com/html/hall_of_illusions.html)
- J) [http://ericir.syr.edu/Projects/Newton/9/phytosy.](http://ericir.syr.edu/Projects/Newton/9/phytosy)

## MLA-Style Citations

Just as students need to be able to cite the books and periodicals they use to support their research, so must they cite the on-line sources in their bibliographies. The following examples were taken from "Citing Internet Resources" (Shrock, K. *Technology Connection*. Sept. 1996, p.9), and can be used by high school students required to follow MLA formats.

### World Wide Web

Author. Title of item. [Online] Available <http://address/filename>, date of document or download.

### Example

DiStefano, Vince. Guidelines for better writing. [Online] Available <http://www.usa.net/~vined/home/better-writing.html>, January 9, 1996.

### FTP

Author. Title of item. [Online] Available <ftp: address, path/filename>, date of document or download.

### Example

Hess, Hanna. Networking in the Information Age. [Online] Available <ftp:194.335.23.10, pub/research/internet/network.txt>, February 5, 1996.

### Gopher

Author. Title of item. [Online] Available <gopher: address, path>, date of document or download.

### Example

Chalmers, A. Bosnia: A Country in Transition. [Online] Available <gopher:nywer.net, Today's News/World News/Bosnia>, February 5, 1996.