

# Tools and Strategies for Facilitating Student Research

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Students growing up in the Information Age are well aware of the need for skills that are new and different than the information seeking skills used by previous generations. Organizations like the American Library Association (ALA), the Association for Educational Communications and Technology (AECT), and the International Society of Technology in Education (ISTE) have developed standards and benchmarks to highlight the types of information literacy skills and outcomes students need to develop (see Figure 1).

Beyond third grade, students are routinely expected to conduct research on a wide variety of topics. While such tasks can challenge academically talented students, students with disabilities

often encounter additional obstacles. Common difficulties may include:

- difficulty in reading due to poor decoding and fluency skills
- poor reading comprehension
- inefficient skills for locating information
- difficulty paraphrasing what has been read
- slow or illegible handwriting that impairs note-taking
- poor organizational skills

The application of technology, specifically assistive technology, to student research has received little attention in the professional literature (Edyburn, 1991). The purpose of this article is

**Table 1**  
Overview of the Big Six research model with links to standards and instructional activities.

The <b>BIG 6</b> Skill	Standards		Activities	
	Information Literacy	NETS	Basic	Advanced
1 Task Definition	1.1 1.3	6.1	concept mapping	graphic organizers
2 Information Seeking Strategies	1.4 2.4	5.3	subject directories evaluating web sites	web site evaluation
3 Location and Access	1.5 7.1	5.1	keyword searching searching strategies	metasearch engines searching tutorial
4 Use of Information	2.1 2.2	2.2	analyze sources	identify point of view
5 Synthesis	3.1 3.4 9.1	3.2 4.2	critical thinking appropriate product bibliographic citations	classroom applications
6 Evaluation	6.1	3.1	assessment rubrics	information power

Source: <http://www.surflin.ne.jp/janetm/big6info.htm>

**Figure 1**  
**Information Literacy Standards from the American Library Association and the Association for Educational Communications and Technology**

## **The Nine Information Literacy Standards for Student Learning**

**Information Literacy**

Standard 1: The student who is information literate accesses information efficiently and effectively.

Standard 2: The student who is information literate evaluates information critically and competently.

Standard 3: The student who is information literate uses information accurately and creatively.

**Independent Learning**

Standard 4: The student who is an independent learner is information literate and pursues information related to personal interests.

Standard 5: The student who is an independent learner is information literate and appreciates literature and other creative expressions of information.

Standard 6: The student who is an independent learner is information literate and strives for excellence in information seeking and knowledge generation.

**Social Responsibility**

Standard 7: The student who contributes positively to the learning community and to society is information literate and recognizes the importance of information to a democratic society.

Standard 8: The student who contributes positively to the learning community and to society is information literate and practices ethical behavior in regard to information and information technology.

Standard 9: The student who contributes positively to the learning community and to society is information literate and participates effectively in groups to pursue and generate information.

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to provide an overview of resources and tools that can be used to facilitate the productivity of student researchers and ultimately enhance their success in locating and using information.

## **Teaching About Research**

As teachers and librarians seek to design instruction on information seeking, models of the research process serve to provide students with a guide to research methodology as well as specific resources to support the process (Edyburn, 1999;

Murray, 2003). One model that is widely used in elementary and middle schools is known as Big6 (see Table 1). This model systematically engages students in a series of tasks involving (1) task definition, (2) information seeking strategies, (3) location and access, (4) use of information, (5) synthesis, and (6) evaluation.

## Search Aids

Students often have difficulty at specific points in the search process. This may involve initially defining their topic, defining a search strategy, or knowing what sources to consult.

## Preparing to search

Students often need help translating ideas about their topics into search terms. A related issue involves narrowing or broadening their topic in ways that will make their research manageable. Several web sites can assist teachers and students in understanding these issues and finding practical ways to resolve the challenge involved in getting started in the research process.

## Worksheets, concept maps, search strategies

One strategy that most students find helpful involves the use of a search worksheet and the identification of specific search strategies. Again, several web sites offer ready-to-use tools and resources to facilitate the work of student researchers.

## Resources for Teaching About Research

### Big6

<http://www.big6.com>

### The Research Cycle

<http://questioning.org/module/cycle.html>

### Which Information Source Should I Use?

[http://www.ri.net/schools/East\\_Greenwich/tools.html](http://www.ri.net/schools/East_Greenwich/tools.html)

### A Research Guide for Students

<http://www.aresearchguide.com/index.html>

## Search Preparation Resources

### Finding Information on the Internet: A Tutorial

<http://www.lib.berkeley.edu/TeachingLib/Guides/Internet/FindInfo.html>

### Study Guides and Strategies

<http://www.iss.stthomas.edu/studyguides/>

### IPL: Teenspace: A+Research and Writing

<http://www.ipl.org/div/aplus/>

### How-to-do Research Searches

<http://www.geocities.com/Athens/3238/bookmark.htm>

## Resources that Feature Search Strategies and Worksheets

### Fact Finder

[http://www.ri.net/schools/East\\_Greenwich/factfinder.html](http://www.ri.net/schools/East_Greenwich/factfinder.html)

### Research Strategy Worksheet

<http://www.tuc.edu/lrc/worksheet.htm>

### Note Taking Worksheet

[http://www.ri.net/schools/East\\_Greenwich/notesheet.htm](http://www.ri.net/schools/East_Greenwich/notesheet.htm)

### Evaluating Web Pages

<http://www.ncsu.edu/midlink/tutorial/WWW.eval.html>

### Research Skills

<http://www.rhlschool.com/research.htm>

### TEK•Mom's Search Tools for Students

<http://www.tekmom.com/search/>

## Starting Points for Young Children

CDROM-based reference tools like electronic encyclopedias and *Guinness Book of World Records*

## Starting Points for Elementary Students

### Ask Jeeves for Kids

<http://www.ajkids.com>

### LibrarySpot

<http://www.libraryspot.com/>

### The Stuff Works

<http://www.howstuffworks.com/>

### This Day in History

<http://www.historychannel.com/historychannel/thisday/>

## Starting Points for Secondary Students

### 101 Best Sites from 2002

[http://www.writersdigest.com/101sites/categorysearch.asp?year\\_101=2002](http://www.writersdigest.com/101sites/categorysearch.asp?year_101=2002)

### Argus Clearinghouse

<http://www.clearinghouse.net/>

### Ask Jeeves

<http://www.askjeeves.com/>

### Encyclopedia Britannica

<http://www.britannica.com/>

### The Internet Public Library Guide for Teen's

<http://www.ipl.org/teen/aplus/>

### Y? The National Forum on People's Differences

<http://www.yforum.com/>

### Why Files

<http://whyfiles.org/>

## Starting Points

Teachers often begin a research project by offering students selected web sites to use as a starting point for their research. From there, they branch in numerous directions depending on the topic they select. Obviously, this requires significant preparation by the teacher. The pay-off, however, is that many students can work semi-autonomous after they find a few useful resources to get started. This approach is often more fruitful than requiring students to start with a search

engine and then wade through millions of irrelevant resources.

## Research Sites for Children

A tactic similar to creating a list of specific starting points is to use general-purpose research sites. Numerous sites have been specifically designed for children and serve as excellent starting points for almost any imaginable research topic. Many students will also find it helpful to access a number of standard reference sites, style guides, and citation tools.

## **Children's Research Resources**

### **Yooligans**

<http://www.yahooligans.com/>

### **KidsClick!**

<http://sunsite.berkeley.edu/KidsClick!/>

### **Research Paper**

<http://www.researchpaper.com>

### **Map Machine**

<http://www.nationalgeographic.com/mapmachine/>

### **EarthWeek**

<http://www.earthweek.com/>

## **Reference Tools**

### **Guide to Grammar and Writing**

<http://webster.commnet.edu/grammar/index.htm>

### **Dictionary.com**

<http://www.dictionary.com>

### **Thesaurus.com**

<http://www.thesarus.com>

### **Plumb Design Visual Thesaurus**

<http://www.visualthesaurus.com/>

### **RefDesk**

<http://www.refdesk.com/>

## **Style Guides**

### **APA Style/Electronic References**

<http://www.apastyle.org/eleceref.html>

### **The Columbia Guide to Online Style**

[http://www.columbia.edu/cu/cup/cgos/idx\\_basic.html](http://www.columbia.edu/cu/cup/cgos/idx_basic.html)

## **Citation Tools**

### **Easy Bib**

<http://www.easybib.com>

### **The Citation Machine**

[http://landmarks4schools.org/citation\\_machine/cm\\_web.php3](http://landmarks4schools.org/citation_machine/cm_web.php3)

### **NoodleTools**

<http://www.noodletools.com/>

### **EndNote**

<http://www.endnote.com/>

### **ProCite**

<http://www.procite.com/>

### **Citation**

<http://www.citationonline.net/>

## Specialized Browsers

Specialized web browsers are a relatively new area of research tool with important applications for individuals with disabilities. For example, Opera allows users to control all navigational and browsing functions with keyboard equivalents. Products like CAST eReader offer built-in speech, note-taking tools, and a dictionary. More work needs to be done in this area to understand the functions of assistive technology for enhancing student performance in online research.

### Resources for Specialized Browsers

#### CAST eReader

<http://www.cast.org/udl/index.cfm?i=211>

#### Opera

<http://www.opera.com>

## Browser Enhancements

Increasingly, functionality can be added to web browsers through the addition of products known as toolbar add-ons. For student researchers, these types of tools can be used to identify web sites similar a site they are currently visiting or to look-up the definitions or synonyms of specific words appearing on a web page. Similar to specialized browsers, this category of tools appears to hold considerable promise for facilitating the research productivity of students with disabilities.

### Toolbar add-ons

#### Alexa

<http://www.alexa.com/>

#### Google

<http://www.google.com/options/toolbar.html>

#### Companion

<http://companion.yahoo.com/>

#### Merriam-Webster Toolbar

<http://www.m-w.com/tools/toolbar/>

#### WordSmyth

<http://www.wordsmyth.net>

## Concluding Thoughts

Learning to research a topic of interest has life-long implications for students. As a result, helping students acquire the knowledge and skills to successfully locate and use information is now viewed as a critical outcome of schooling. The resources and tools highlighted in this article have important instructional and assistive technology applications for students with disabilities. Additional exploration of the possibilities technology affords for enhancing research productivity is warranted (Edyburn, 1999).

## References

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## Plagiarism

The increased use of the Internet in support of student research has fostered concerns about plagiarism and appropriate citation of sources.

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