

## Chapter 2

# INFORMATION TECHNOLOGY:

## *Using the Internet for Student Research*

Janet R. Murray

*Nile C. Kinnick High School, Yokosuka, Japan*

**Abstract** In the rush to adopt Internet technologies, many schools have underestimated the need for human infrastructure. Experienced educators know that we must add an “A” to “tech”: technology in isolation ignores the “A” in “teAch.”

To conduct research on the Internet, students must learn to navigate skilfully by using subject directories and search engines. It is imperative that students and teachers examine information sources with a critical eye, evaluating their authority, accuracy, objectivity, currency and relevance. Teachers must also reconsider the design of their research assignments so that they promote original thinking through synthesizing a variety of materials while avoiding Internet-fostered plagiarism.

**Key words:** Information literacy, information retrieval, information skills, Internet, secondary school curriculum, World Wide Web

## 1 INTRODUCTION

Clifford Stoll, self-proclaimed High Tech Heretic, “assails high-tech boosterism, attacking the trendy assumption that computers will profoundly improve our schools, libraries, and whole society.”<sup>1</sup> In the rush to adopt new technologies, schools and districts have too often ignored the simple fact that machines do not change teaching and learning. People do. Experienced educators know that we must add an “A” to “tech”; technology in isolation ignores the “A” in “teAch.”<sup>2</sup>

<sup>1</sup> Kirkus Reviews of High Tech Heretic by Clifford Stoll [Doubleday, 2000].

<sup>2</sup> Janet Murray, “From School Librarian to Information TeAchnician: A Challenge for the Information Age,” *Library Talk*, Worthington, OH: Linworth, May 1999, pp. 10-13.

## 2 PROBLEM STATEMENT

The CEO Forum, a national group of U.S. business leaders, reported that “although there are more than 6 million computers in the nation’s schools, most teachers lack the training to use them effectively. Why? Because . . . schools are spending less than \$6 per student on the computer training of teachers, contrasted with more than \$88 per student on computers, computer programs and network connections.”<sup>3</sup> In the American idiom, this is known as “putting the cart before the horse.”

Henry Jay Becker’s national survey, “Teaching, Learning and Computing: 1998,” supports the CEO Forum’s conclusions. “We found that 90% of all U.S. schools have some kind of access to the Internet. What is so remarkable about this statistic is that most schools, which historically change so slowly, have made this connection within just 5 years.”<sup>4</sup> However, Becker’s study also reveals the need for professional development appropriate to the integration of technology in the classroom.

In 1997, the U.S. President’s Committee of Advisors on Science and Technology (PCAST) observed that, “The benefit to students increasingly will depend on the skill with which some three million teachers are able to use these new tools.”<sup>5</sup>

Although 95 percent of American schools now have Internet access, many teachers still do not know how to use the tools or do not feel comfortable using the technology in their classrooms. According to a survey by Market Data Retrieval, 61 percent of teachers in elementary or secondary schools consider themselves “somewhat prepared” or “not at all prepared” to incorporate technology into their lessons. Many of these teachers feel intimidated by having computers in their classrooms, especially when their students may have more computer experience than they do, while other teachers simply do not think computers add anything to the educational process.<sup>6</sup>

A business-oriented publication expressed its concern in September, 2000.

<sup>3</sup> “Inadequate Computer Training for Nation’s Teachers.” Associated Press, February 1999.

<sup>4</sup> Ronald E. Anderson and Amy Ronnkvist, “The Presence of Computers in American Schools,” *Teaching, Learning and Computing: 1998: A National Survey of Schools and Teachers*. Center for Research on Information Technology and Organizations. June 1, 1999. [http://www.crito.uci.edu/tlc/findings/computers\\_in\\_american\\_schools](http://www.crito.uci.edu/tlc/findings/computers_in_american_schools)

<sup>5</sup> “President’s Committee of Advisors on Science and Technology (PCAST): Its Report on Technology in Education,” FYI #107: Education Technology Report FYI. The American Institute of Physics Bulletin of Science Policy News Number 107, September 4, 1997. <http://members.stratos.net/aw/tech.pcast.htm>

<sup>6</sup> “As Computers Idle in Classrooms, Training for Teachers is the Next Challenge,” *New York Times*, July 3, 2000, quoted in *Edupage*, July 3, 2000.

Digital educational tools in public schools across the country may prove to be a disappointment if educators are unable to incorporate the technology into their curriculum. Getting the most out of computers and Internet access in schools is a major challenge for teachers because many do not have the skills to use the technology effectively.<sup>7</sup>

Ken Wasch, president of the Software & Information Industry Association, concludes,

Technology improves teaching and learning, but the simple addition of computers in schools does not directly translate to higher test scores and never will. From the school board and district administrators to principals and teachers, setting the right conditions and thorough training are the two most important keys to success. In this sense, the process of technology integration into the curriculum is just as important as the technology itself.<sup>8</sup>

The “2000 Report on the Effectiveness of Technology in Schools” concurs with the statement that the “leading variable” influencing the effectiveness of education technology is educator training. Teachers would argue that society has unfairly burdened them with the responsibility for implementing technology without providing adequate opportunities to learn the necessary skills.

According to Education Week’s third annual study of the state of technology in schools, “Even when computers are available, teachers said they simply do not have enough time or incentive to use digital content over books and other traditional methods.”

“One of our main findings was that most teachers are having trouble finding high-quality software and Web sites,” said Erik Fatemi, Education Week’s project editor for the report. “It’s one thing to train teachers on just the technical aspects of the technology, but it’s another thing entirely to teach them how to use that technology effectively in the classroom.”<sup>9</sup>

Margaret Honey concludes: “Teachers cannot be expected to learn how to use educational technology in their teaching after a one-time workshop. Teachers need in-depth, sustained assistance not only in the use of the technology but in their efforts to integrate technology into the curriculum.”<sup>10</sup>

<sup>7</sup> “Technology Savvy Schools,” *Business 2.0*, September, 2000, quoted in Edupage, August 28, 2000.

<sup>8</sup> “SIIA Releases Report on Effectiveness of Education Technology,” press release 8/24/2000.

<sup>9</sup> Courtney Macavinta, “Teachers see major obstacles to wiring schools,” *Education Week*, September 27, 1999.

<sup>10</sup> Margaret Honey, Katherine McMillan Culp, and Robert Spielvogel, “Critical Issue: Using Technology to Improve Student Achievement,” Center for Children and Technology,

Some entrepreneurs have tried to meet the challenge of inadequate professional development by creating CD-ROM resources and structured sequential courses. Their products may be glitzy and glamorous, and administrators may be tempted to buy them as an “easy” solution. However, any technology offering which ignores the disparity among individuals and the need for ongoing, personal support is likely to be as unsuccessful as the one-time workshop.

Educators need a framework to organize their thinking about integrating technology in the curriculum. Research is traditionally part of the pre-university curriculum. Perhaps we can use the research process to introduce information literacy and technology skills to teachers, and benefit today’s students at the same time.

### 3 INFORMATION LITERACY

Traditionally, schools taught the “three R’s: reading, ‘riting and ‘rithmetic.” “Literacy” was captured in international census data by estimating the percentage of people who could read and write.

As computers became essential in the workplace and dribbled into schools, “computer literacy” entered the curriculum, usually in the form of an introduction to the new vocabulary of bits and bytes, hardware and software. Computer courses focused on programming languages. “Keyboarding” replaced typing.

#### 3.1 Definition

The term “information literacy” first appeared in the mid-1970s as awareness grew that information was becoming an overwhelming and unmanageable deluge. In the 1980s, people realized that computers might be useful tools for organizing and retrieving information. In 1989, the American Library Association codified a definition which provided the basis for subsequent discussion: “To be information literate, a person must be able to recognize when information is needed and have the ability to locate, evaluate, and use effectively the needed information.”<sup>11</sup> In other words, “literacy” implies more than vocabulary and awareness; it requires critical thinking.

This connotation of “literacy” – one that includes interpretation and evaluation of a medium of expression – is applied in many different contexts. One reads about visual literacy, media literacy, textual literacy, numerical literacy, technology literacy and network literacy. In each case, the author

---

adapted by North Central Regional Technology in Education Consortium, 1999. <http://www.ncrel.org/sdrs/areas/issues/methods/technlgy/te800.htm>

<sup>11</sup> “Final Report of the American Library Association Presidential Committee on Information Literacy” (1989) quoted in Kathleen L. Spitzer with Michael B. Eisenberg and Carrie A. Lowe, *Information Literacy: Essential Skills for the Information Age*. Syracuse, N.Y.: ERIC Clearinghouse on Information & Technology, 1998, p. 22.

expects the word “literacy” to suggest a complex of skills, including analysis, evaluation, synthesis and application.

### 3.2 Economic Motivators

Economic forecasters and business analysts predict that 21<sup>st</sup> century jobs will require information-processing skills. They expect a fundamental shift from production to information management, with a much higher percentage of the workforce employed in service industries. The 1990 report of the Secretary’s Commission on Achieving Necessary Skills (SCANS) identifies information and technology as two of the five competencies essential for employment.<sup>12</sup>

Education is needed to combat high-tech labor shortages, concludes the 21st Century Workforce Commission report. After months of interviews and hearings conducted nationwide, “A Nation of Opportunity” recommends adult learning, early-childhood education initiatives, and regional training programs as a way to foster 21st Century Literacy. Labor analysts warn that the economy will suffer without such literacy, a combination of traditional and technical skills.<sup>13</sup>

Thus, this is not solely an education issue; it is an economic issue. Just as the realities of the workplace dictated the introduction of computers into schools, the needs of the future work force dictate the importance of acquiring information problem-solving skills. In an environment of rapid change, we must provide opportunities and skills for lifelong learning.

Companies across all industries have come to view e-learning initiatives as essential to continued success. IBM’s James Sharpe says “E-learning is one way to be smarter than the competition.” IBM’s Sharpe says the best e-learning initiatives are those that are integrated with ongoing training processes. Companies are projected to spend \$11.5 billion annually on e-learning initiatives by 2003, according to International Data, up from \$3 billion spent on e-learning last year.<sup>14</sup>

“Over the next 5 to 10 years, the same technologies that have forced corporations to remake themselves for e-commerce hold the potential to similarly transform U.S. education.”<sup>15</sup> But this is not an exclusively American challenge; it is an international challenge. The June 1999, G8 Economic Summit concluded:

<sup>12</sup> Ibid.

<sup>13</sup> “Report Calls for Workforce Education,” Washington Post, 27 June 2000, quoted in Edupage, June 28, 2000.

<sup>14</sup> “Online Learning: The Competitive Edge,” InformationWeek Online, August 28, 2000, quoted in Edupage, August 28, 2000.

<sup>15</sup> William C. Symonds, “Wired Schools: A technology revolution is about to sweep America’s classrooms,” Business Week Online, September 25, 2000.



<http://www.springer.com/978-0-7923-7508-1>

Electronic Business and Education  
Recent Advances in Internet Infrastructures  
Chin, W.; Patricelli, F.; Milutinovic, V. (Eds.)  
2002, XII, 400 p., Hardcover  
ISBN: 978-0-7923-7508-1