

Contemporary Literacy:

Redefining the Basics

By Ferdi Serim

Technology is the Big Bang that has propelled literacy into an expanding universe.

Scientists, no longer able to keep up through printed journals, now understand each other's work online, using sophisticated simulations and collaborative workspaces made possible by supercomputing. Economists, unable to process the volume and complexity of financial transactions, employ armies of programmers to deploy powerful tools for real-time visualization of the flow of wealth. The latest tools for graphing, analyzing and manipulating information extend literacy by enabling people to perceive relationships hidden below the surface and synthesize meaning from these relationships.

The challenge of keeping up with the information explosion that is having such a profound impact on all of our lives can only be met through the development of a new set of literacy skills.

WHAT IS CONTEMPORARY LITERACY?

In recent years, many groups have set out to define the skills needed to succeed in today's rapidly-changing world. As you can see from the chart on page 4, the 21st century skills recommended by these groups range from

inventive thinking to global awareness, from collaboration to effective use of real-world tools. An integral part of many of the 21st century skills frameworks is an attempt to define an array of "literacies" for the digital age.

As Janet Murray wrote in a March, 2003, article in *Multimedia Schools*, "We read about visual literacy, media literacy, textual literacy, numerical literacy, technology literacy and network literacy. In each case, the author expects the word 'literacy' to suggest a complex of skills, including analysis, evaluation, synthesis and application"

Clearly, literacy today involves much more than the reading and writing of text. It includes hypertext writing, visual thinking and information-based problem solving. It requires an ability to understand and use a variety of media and to be a critical and savvy user of information technology. In today's world, "information thinking skills" are the true essentials.

For district CTOs, school administrators, media specialists and others in the education technology world, it is particularly crucial to understand evolving definitions of literacy as it relates to digital technology – or what is increasingly being referred to worldwide as Information and Communication Technologies (ICT).

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ICT LITERACY DEFINED

In January, 2001, the Educational Testing Service convened an international panel to study the growing importance of existing and emerging technologies. The resulting report, *Digital Transformation*, defines ICT literacy as “using digital technology, communications tools, and/or networks to access, manage, integrate, evaluate, and create information in order to function in a knowledge society.”

A similar definition of ICT Literacy appears in the 2003 report, *Learning for the 21st Century*. Quoting the Programme for International Student Assessment (PISA), *Learning for the 21st Century* summarizes ICT proficiency as “the interest, attitude and ability of individuals to appropriately use digital technology and communication tools to access, manage, integrate, and evaluate information, construct new knowledge and communicate with others in order to participate effectively in society.”

In the 1999 report, *Being Fluent with Information Technology*, the National Research Council had reached similar conclusions about what it referred to as “fluency.” The authors explained, “The requirement of a deeper understanding than is implied by the rudimentary term ‘computer literacy’ motivated the committee to adopt ‘fluency’ as a term connoting a higher level of competency. People fluent with information technology (FIT persons) are able to express themselves creatively, to reformulate knowledge, and to synthesize new information. Fluency with information technology (i.e., what this report calls FITness) entails a process of lifelong learning in which individuals continually apply what they know to adapt to change and acquire more knowledge to be more effective at applying information technology to their work and personal lives.”

The North Central Regional Educational Laboratory’s framework for 21st Century Skills defines eight elements of digital-age literacy. The three that relate most closely to ICT literacy – or fluency, if you prefer – are:

- **Technology Literacy:** Knowledge about what technology is, how it works, what purposes it can serve, and how it can be used efficiently and effectively to achieve specific goals.
- **Visual Literacy:** The ability to interpret, use, appreciate and create images and video using both conventional and 21st century media in ways that advance thinking, decision making, communication, and learning.
- **Information Literacy:** The ability to evaluate information across a range of media; recognize when information is needed; locate, synthesize, and use information effectively; and accomplish these functions using technology, communication networks and electronic resources.

There appears to be widespread agreement among experts that ICT literacy must go beyond a simple understanding of technology and how it works. As the U.S. Department of Education’s national technology plan for the year 2000 put it, “A meaningful, unified approach to providing students with the skills they will need for their futures must be more than a checklist of isolated technology skills, such as knowing the parts of a computer, writing drafts and final products with a word processor, or searching for information using a CD-ROM database.”

Along these same lines, the ETS panel concluded, “The concept of ICT literacy should be broadened to include both critical cognitive skills as well as the application of technical skills and knowledge. These cognitive skills include general literacy, such as reading and numeracy, as well as critical thinking and problem solving. Without such skills, the panel believes that true ICT literacy cannot be attained.” The authors of *Learning for the 21st Century* concur, emphasizing that ICT literacy is the intersection between 21st century learning skills – such as problem solving, self-direction and interpersonal skills – and digital tools.

AN APPROACH GROUNDED IN RESEARCH

The research basis for teaching both information and visual literacy is extensive. In a recent literature review, *Research Foundations of the Big6 Skills*, Carrie Lowe cites a 1995 study in which researchers found that student success on complex, subject-related tasks depended on the use of a combination of domains, including information problem-solving skills. In other research cited by Lowe, Carol Kuhlthau demonstrates the importance of learning information skills in context and not as discrete tasks. She maintains that information literacy is not a set of individual tasks or skills, but rather a way of thinking that allows individuals to be flexible thinkers and lifelong learners who will succeed in the information age.

As Bransford, Brown and Cocking note in *How People Learn: Brain, Mind, Experience, and School*, “Helping students to organize their knowledge is as important as the knowledge itself, since knowledge organization is likely to affect students’ intellectual performance.”

Today’s technology increases the opportunity for such organizational help to come in visual form. Which, according to Dr. Mary Chase, is a good thing. In *The Foundations and Educational Applications of Visual Learning*, she reports, “Research in educational and cognitive psychology has revealed that learning is enhanced when information is dual coded in both visual and verbal modes. In practice, classroom use of visual learning techniques to achieve this dual coding effect is most often expressed in the form of graphical organizers. These have been strongly associated with increased performance, retention, and critical thinking skills.”

A 2001 study, *Classroom Instruction that Works: Research-based Strategies for Increasing Student Achievement*, reaches similar conclusions. “The more we use both systems of representation—linguistic and non-linguistic—the better we are able to think about and recall knowledge.

This is particularly relevant to the classroom, because studies have consistently shown that the primary way we represent new knowledge to students is linguistic This means that students are commonly left to their own devices to generate nonlinguistic representations. When teachers help students in this kind of work, however, the effects on achievement are strong.”

IMPLEMENTATION STRATEGIES

So how do administrators, curriculum specialists and teachers go about integrating contemporary literacy into the K-12 curriculum? Fortunately, there are a growing number of resources available to help.

One of the most widely-known is the Big6 approach which integrates information search and use skills with technology tools in a systematic process to find, use, apply, and evaluate information for specific needs and tasks. The Big6 web site (www.big6.com) includes lessons, links and information about workshops, publications and a free newsletter featuring strategies and tools for teaching information age skills.

A March, 2003, article in *Technology & Learning* magazine, “Web Literacy and Critical Thinking: a Teachers’ Toolkit,” offers a variety of teaching suggestions and an extensive directory of resources to teach information literacy – including web quests, tools for teaching search strategies, checklists for evaluating web resources and the use of “hoax” web sites to develop critical sleuthing skills.

Here are just of the few tips offered by researchers and practitioners on effective approaches to incorporating contemporary literacy into the curriculum:

■ Involve the Library/Media Specialists

Based on two of the studies reviewed in *Research Foundations of the Big6 Skills*, Carrie Lowe suggests that the best way to teach information literacy skills in a school setting is through the

COMPARISON OF LEADING 21ST CENTURY SKILL MODELS

EnGauge 21st Century Skills	NETS ISTE	What Work Requires SCANS	Information Literacy AASL and AECT	Technically Speaking NAE/NRC	Technological Literacy ITEA	Partnership for 21st Century Learning
DIGITAL-AGE LITERACY						
Basic Literacy	✓	✓			✓	
Scientific Literacy	✓		✓	✓	✓	
Technological Literacy	✓	✓	✓	✓	✓	
Economic Literacy	✓	✓	✓	✓	✓	✓
Visual Literacy	✓	✓			✓	✓
Information Literacy	✓	✓	✓			
Multicultural Literacy	✓	✓		✓	✓	✓
Global Awareness					✓	✓
INVENTIVE THINKING						
Adaptability/Managing Complexity	✓				✓	
Self-Direction	✓	✓	✓		✓	
Curiosity	✓		✓			
Creativity	✓	✓	✓		✓	✓
Risk Taking						
Higher-Order Thinking/Reasoning	✓	✓	✓		✓	✓
EFFECTIVE COMMUNICATION						
Teaming and Collaboration	✓	✓	✓			✓
Interpersonal Skills	✓				✓	
Personal Responsibility	✓	✓	✓			✓
Social and Civic Responsibility	✓	✓	✓	✓		✓
Interactive Communication	✓	✓			✓	✓
HIGH PRODUCTIVITY						
Prioritizing, Planning, and Managing	✓	✓	✓	✓		✓
Effective Use of Real-World Tools	✓	✓	✓	✓		✓
Producing Relevant, High-Quality Products	✓		✓		✓	✓

Source: enGauge (www.ncrel.org), with Partnership for 21st Century Learning added for this article.

collaboration of classroom teachers and library media specialists. This held true in studies of both K-12 and higher education classes.

■ Use Project-Based, Authentic Learning

Many of the studies and reports cited here conclude that “learning by doing” is key to developing 21st century learning skills. As the Business Higher Education Forum’s *Building a*

Nation of Learners states, “Research shows that if students experience a high level of interaction with content, the rate of motivation and retention increases, and learning improves. Learning by doing is an important tool for the redesign of education to help students learn quickly and retain concepts. The traditional style of ‘lecture, listen, and learn’ needs to be replaced with a

more active style of learning that emphasizes reasoning, interpretation, and problem solving.”

■ Ask the Right Questions

As a number of the experts interviewed in “Web Literacy and Critical Thinking” point out, an important component of teaching critical thinking is to revamp the sorts of assignments teachers commonly give to their students. For example, David Jakes and his partners at Internet Innovations, Inc., suggest that, rather than asking students to address a question like “What is cancer?” or “What are some facts about Puerto Rico?” teachers need to be steering them to such essential questions as “What plan can I develop for reducing the chance that I will contract cancer in my lifetime?” or “Should Puerto Rico become the 51st state in the U.S.?”

For additional suggestions, see David Warlick’s “Contemporary Literacy Action Items” on page 6.

CHANGING THE WAY SCHOOLS OPERATE

As reported in *Building a Nation of Learners*, “Leading innovators are fundamentally altering centuries-old learning techniques, challenging basic assumptions about learning, and transforming the way teachers instruct, students learn, and learning occurs. Some of the changes entail changing the way class time is used, altering the types of activities in which students engage, or creating entirely new forms of content.”

All of these changes require a willingness, on the part of teachers and administrators, to develop new skills and ways of working. Because we seek 21st century skills for our students, we must adopt – and model – these ourselves. This is essential for preparing students for their future and fulfilling the ambitious national goals set by No Child Left Behind (NCLB).

Meeting today’s challenges requires the development and applications of the following 21st century skills by school personnel:

■ Understanding Data

A variety of information processing skills are required for schools to succeed in shifting to the evidence based practice required by NCLB. For example:

- For all students to reach *high academic standards*, schools need information about the learning profiles of each student, which interventions have been tried, and which have been successful for students with similar profiles.
- For all limited English proficient students to become *proficient in English* and reach *high academic standards*, similar learning profiles need to be correlated to successful LEP interventions from other schools.
- For all students to be educated in learning environments that are *safe, drug free, and conducive to learning*, community involvement and support must be developed, guided by evidence of effectiveness.
- For *all students to graduate from high school*, longitudinal data that identifies critical points and effective strategies for intervention must be used to prevent students from dropping out.

To accomplish all of the above, staff must become skilled in ways that were not measured when they obtained their qualification credentials. Regardless of the level and sophistication of technology employed, drawing meaning from data is a task that only humans can perform.

For more on data-driven decision making see the following CoSN publications: *The Great Race (2004 CoSN Compendium)*, *No More Flying Blind (2003 CoSN Compendium)* and *Vision to Know and Do* (www.3d2know.org).

■ Teaming and Collaboration

Working collaboratively should be as important for educators as it is for other professionals. Timber Drive Elementary School in Garner, North Carolina, is one school where collaborative planning and teaching takes center stage. The research and

CONTEMPORARY LITERACY ACTION ITEMS By David Warlick

Following are some actions for educators to take to promote 21st century literacy for K-12 students.

District Technology Leaders

- Establish a vision for twenty-first century literacy that reflects the changing nature of information, lifelong-learning, and individual pursuit, and is simple enough to describe in three sentences. When this is accomplished, stop talking about integrating technology, and start talking about integrating literacy.
- Plan, purchase, and configure appropriate hardware, software, and infrastructure in your schools and offer ongoing professional development to support daily use of digital information in every classroom.
- Establish an information ethics policy that addresses information reliability issues, proper treatment of intellectual property, and respect for digital infrastructure; and promote its integration into all disciplines.

School-based Technology Leaders

- Attend all grade-level and subject-area meetings and establish an online curriculum map with resources and strategies aligned toward integration for disciplines and daily use of digital information materials.
- Support in all ways the appropriate use of Internet research; critical evaluation of information; digital organization and

archiving; digital analysis, translation, and manipulation of information; and communication through word processing, desktop publishing, graphics, and web, music, animation, and video production.

Principals

- Integrate into your evaluation procedures the expectation that teachers will use digital information materials in their lessons on a daily basis.
- Establish the capacity to provide one-to-one computer experiences and other sorts of technology access for students on a daily basis.
- Lead the way in creating, implementing and supporting a curriculum in which contemporary literacy – including critical thinking, visual literacy, technology literacy and more – plays an integral role.

Teachers

- Establish and maintain a personal digital information library of online resources that can easily be integrated into classroom activities. Continue to grow and adapt your library to increase its professional value.
- Be digital. Make the Internet a part of assignments and lessons. Integrate digital information into everything that you do. With each lesson that you teach, do a quick search of a news search tool to add current information.
- Identify the students in your classroom who are already adept at using technology. Ask for their advice on

an ongoing basis, even if the information is not digital (“Terri, what could we do with this information if we found it in a database?”).

- Note those students who do not have easy access to technology outside of the classroom and explore ways of getting it to them through the school technology facilitator, media specialist, principal, or other community leaders.
- Have a digital video camera in your classroom, charged, and at your disposal at all times. Treat it as a note-taking tool, using it to record events that might be useful in the future. Encourage students to do the same.
- Make digital still cameras available for students to use on a regular basis and encourage them to incorporate images and video into their school projects. In addition, look for opportunities to record places, people, events, or situations that are relevant to what you teach.
- Study the school’s information ethics policy and treat it as part of your curriculum. Design into your lessons opportunities for students to critically evaluate researched information, appropriately utilize copyrighted intellectual property, and examine the roles interactive technology plays in their daily lives.

Look for an extensive examination of these ideas in David Warlick’s upcoming book, Redefining Literacy for the 21st Century, (Linworth Publishing)

strategies underlying the process used by Timber Drive are described in *Information Technology for Learning: No School Left Behind*, which details a method to achieve the recommendations articulated by Mike Eisenberg and Carrie Lowe in “Call to Action: Getting Serious about Libraries and Information in Education.”

These strategies begin with the formation of Information and Technology (I&T) Teams at the building level, in order to provide the capacity for sustained support of educational improvement. The members of the I&T Team are the people in

schools who are most involved in the implementation of technology: the principal, the library media specialist, the teacher leader and the technical specialist, supported by the district technology coordinator. The I&T Team uses the Big6 Process to analyze information and guide its decisions.

Notes Sue King, principal, “Once you get over the illusion that you may someday arrive at technology integration, and realize that improvement is forever, it becomes quite exciting. We all say *this is a work in progress* and I hope we never stop saying it.”

■ Research Skills

In this era of accountability, schools and curriculum providers are expected to focus on and learn from scientifically-based research (SBR). And yet there is evidence that this is not easy for most educators. Teachers, in particular, are rarely taught the skills necessary to view themselves as researchers – or even consumers of research conducted by others.

The Use of Research by Teachers: Information Literacy, Access and Attitudes, a study conducted at Robert Gordon University in Scotland, examined teachers' current practice, attitudes and skills in relation to the effective use of research outputs in their professional practice. The authors wrote, "Evidence suggested that teachers ... tended to see the process of seeking and evaluating research information as ... a challenge. Although they expressed some uncertainty about search strategies, teachers generally felt least confident in the area of evaluating and using (organizing, synthesizing, communicating) research outputs and, indeed, information generally. This should be of concern given the problems of information overload which can arise and also given the key role teachers have in developing effective skills and strategies in their own students."

The study also concluded that the skills and training of library/media specialists are far too often "overlooked and underutilized given the powerful role they can play in bridging the gap between research and practice" and recommended "greater collaboration between head teachers and librarians in ensuring that the development of a research ethos in school also includes the development of effective methods for dissemination."

CONTEMPORARY LITERACY REQUIRES DIGITAL EQUITY

Literacy has always been at the heart of the education enterprise. It has long been a foundation for citizenship. Unfortunately, it

has also been used as a wedge, from the times of slavery, when teaching slaves to read was a felony, to the civil rights era, when literacy tests relied upon the inequality of schools to recreate a disenfranchised population by proxy.

The ICT Literacy effort is truly international. The ICT Literacy web site (www.ictliteracy.info) represents a global partnership to promote universal ICT digital literacy. The site provides a rich, centralized portal for the repository of resources, highlights innovative efforts and partnerships promoting ICT literacy, and encourages participants to share ideas and work collaboratively. "We encourage strategic planners, futurists, and thought leaders to share with our audience their 'out of the box' thinking," says Brenda Kempster, a principal of the site, which will provide collaborative areas for readers of this article who wish to continue discussions online.

"The 'digital divide' in ICT literacy remains a global reality," she adds. "This reality has prompted the partners involved in this effort to collaborate on actions at the national and international level to achieve ICT literacy worldwide – thus fostering 'digital opportunity' for the children and the workforce of the new millennium."

We are at a pivotal moment regarding education and society, a moment that challenges us to focus on contemporary literacy – for our students, teachers and other members of the school community – as central to the process of improving education. Although the elements for success exist in every school, they lie dormant until they are aligned to support the compelling vision of contemporary literacy in a digital age. The time to start is now, when the communities that provide context for our work in schools seem to understand the imperative to prepare our children for the challenges and responsibilities that will become theirs when they leave our care.

CONTEMPORARY LITERACY RESOURCES

Skills Frameworks and Reports

Building a Nation of Learners: the Need for Changes in Teaching and Learning to Meet Global Challenges (2003)

www.acenet.edu/programs/bhef
The Business-Higher Education Forum

enGauge 21st Century Skills: Literacy in the Digital Age (2003)

www.ncrel.org/engauge/skills/skills.htm
North Central Regional Educational Laboratory (NCREL)

Learning for the 21st Century (2003)

www.21stcenturyskills.org/skills.pdf
The Partnership for 21st Century Skills

Digital Transformation: A Framework for ICT Literacy (2002)

www.ets.org/research/icliteracy
Educational Testing Service

Technically Speaking: Why all Americans Need to Know More about Technology (2002)

www.nap.edu/books/0309082625.html
National Academy of Engineering (NAE) and the National Research Council (NRC)

National Educational Technology Standards (2000-2001)

cnets.iste.org
International Society for Technology in Education

e-Learning: Putting a World Class Education at the Fingertips of All Children (2000)

www.ed.gov/about/offices/list/os/technology/reports/e-learning.html
US Department of Education.

Standards for Technological Literacy (2000)

www.iteawww.org/TAA/PDFs/xstnd.pdf
International Technology Education Association (ITEA)

Being Fluent with Information Technology (1999)

books.nap.edu/html/beingfluent
Committee on Information Technology Literacy, National Research Council.

Information Literacy Standards for Student Learning (1998)

www.ala.org/aasl/ip_nine.html
The American Association of School Librarians (AASL) and Association for Educational Communications and Technology (AECT)

What Work Requires of Schools (1991)

wdr.doleta.gov/SCANS/whatwork/whatwork.html
The Secretary's Commission on Achieving Necessary Skills (SCANS)

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