Information Literacy as a Liberal Art

Enlightenment proposals for a new curriculum

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What does a person need to know today to be a full-fledged, competent and literate member of the information society? As we witness not only the saturation of our daily lives with information organized and transmitted via information technology, but the way in which public issues and social life increasingly are affected by information-technology issues - from intellectual property to privacy and the structure of work to entertainment, art and fantasy life - the issue of what it means to be information-literate becomes more acute for our whole society. Should everyone take a course in creating a Web page, computer programming, TCP/IP protocols or multimedia authoring? Or are we looking at a broader and deeper challenge - to rethink our entire educational curriculum in terms of information?

In responding to these questions, it is useful to return to the 18th-century Enlightenment, when thinkers began to confront the relationship between scientific progress and the emergence of a free society. It is exactly 200 years since the publication of Condorcet's Sketch for a Historical Picture of the Progress of the Human Mind, the Enlightenment's greatest philosophy of history manifesto, written while Condorcet - mathematician, scientist, philosopher, educational reformer, and journalist - was in hiding from the Jacobin terror of the French Revolution. In his Sketch, Condorcet told the story of humanity as a story of progress, in which "nature has joined together indissolubly the progress of knowledge and that of liberty, virtue, and respect for the natural rights of man," leading inevitably to humanity's "perfection" and "happiness." Condorcet is relevant to us today because he was attempting to project and plan for the future at a historical turning point.

According to Condorcet, the spread of knowledge through the improvement and democratization of education would contribute directly to political freedom and human happiness. The Enlightenment's conception of the link between knowledge, liberty and happiness - a conception that is reflected in the Declaration of Independence and the U.S. Constitution but is now widely under attack by postmodernists, technocrats and political conservatives - raises profound questions for those of us involved and concerned with not only the implementation and uses of information technology but with providing for knowledge and literacy about this technology.

Literacy Compared to What?

What sort of "information literacy" - an often-used but dangerously ambiguous concept - should we be promoting, and what should it accomplish? Is it merely something that will reduce the number of tech support calls that we have to deal with? Something that will grease the wheels of the information highway? Something that, as defined by representatives of the library community, enables people to be "effective information consumers"?

Or is it, should it be, something broader, something that enables individuals not only to use information and information technology effectively and adapt to their constant changes but also to think critically about the entire information enterprise and information society? Something more akin to a "liberal art" - knowledge that is part of what it means to be a free person in the present historical context of the dawn of the information age?

In his projection of the human future - of history "after the revolution" - Condorcet articulated the Enlightenment view that human progress would continue and lead to the "abolition of inequality between nations, the progress of equality within each nation, and the true perfection of mankind." Essential preconditions were, according to Condorcet, the abolition of inequality in education and the spread of science and knowledge to the general population. Providing suitable education to each citizen would produce not only enlightenment but liberty.

Educated citizens would not only be able to manage their lives properly: "They will be able to govern themselves according to their own knowledge; they will no longer be limited to a mechanical knowledge of the procedures of the arts or of professional routine; they will no longer depend for every trivial piece of business, every insignificant matter of instruction on clever men who rule over them in virtue of their necessary superiority." Condorcet believed that this would be made possible not only by improving and democratizing education but by simplifying conceptual schemes through the integration and unification of science, and the development of graphical representations of logical and scientific ideas and theories. Thus the average citizen would be able to master the science of her day (Condorcet was also a firm advocate of complete equality between the sexes, so the feminine pronoun is in order here).

Two centuries later - ironically at a time when between 40 to 50 percent of the U.S. population is functionally illiterate in the Gutenberg galaxy of text-based literacy - information, its technologies (hard and soft), and its concepts and structures are transforming the production, distribution and consumption of knowledge, from network co-authored texts through databases and data-analysis software to multimedia network-distributed hypertext. Some, such as the French father of postmodernism Jean-Francois Lyotard, argue that this both alters the status of knowledge itself as well as the legitimizing principles of our entire society.

This set of circumstances forces us to ask, what do citizens need to know about information and these technologies to "no longer be limited to a mechanical knowledge of the procedures of the arts or of professional routine," so that "they will no longer depend for every trivial piece of business, every insignificant matter of instruction on clever men who rule over them in virtue of their necessary superiority?" - clever men who are likely nowadays to be programmers, systems analysts, network service providers, Webmasters, information industry moguls and directors of academic computing rather than kings and noblemen.

These questions are even more important now that some of the most vital questions about the emerging phase of our society - some of its most important economic, social and political issues - are turning out to be about both information itself and about the information infrastructure:
Who owns information? What's the difference between a piece of information and a copy of it? Who should have access to it? Is the Internet a public good or a private one? Should anyone regulate Internet content, and if so who? What are the responsibilities of an institution toward one of its telecommuters in another country?

What should the property regime of the information economy be? How can we reconcile the international character of the Internet and the emerging global information society with the laws of individual nations and the moral standards of individual communities? What are the bounds of privacy in information? Could the government fiscal crises be alleviated by a "bit tax"? Is the vision of a wired, networked cyberspace perhaps nothing more than (in the words of some recent social critics) a "cryptoreligious ideal of our society," an ideological front for a new social class, the "virtual class" that is constructing a world of "data trash"?

At this very moment, such questions - whose answers affect not only information consumers but the economic, social and cultural life of society as a whole - are being discussed and decided in terms and venues of which many citizens have little if any knowledge. Can an "effective information consumer" or computer-literate office worker think critically about them, let alone answer them? And, if not, is not information literacy a much broader concept? Isn't there a direct connection between that browser on my screen, the Internet and these policy questions?

Information Literacy as a New Liberal Art

Information and computer literacy, in the conventional sense, are functionally valuable technical skills. But information literacy should in fact be conceived more broadly as a new liberal art that extends from knowing how to use computers and access information to critical reflection on the nature of information itself, its technical infrastructure, and its social, cultural and even philosophical context and impact - as essential to the mental framework of the educated information-age citizen as the trivium of basic liberal arts (grammar, logic and rhetoric) was to the educated person in medieval society.

Indeed, such an extended notion of information literacy is essential to the future of democracy, if citizens are to be intelligent shapers of the information society rather than its pawns, and to humanistic culture, if information is to be part of a meaningful existence rather than a routine of production and consumption. If organizations, in computer-scientist Abbe Mowshowitz's analysis, are becoming virtual, should not an employee understand something about virtual memory in order to negotiate organizational life? And if virtual reality is, in philosopher Michael Heim's words, a "metaphysics," may we perhaps need some "metaphysical literacy" in order to cope with it?

Some will reply that living in a society based on the automobile doesn't require the population to learn either auto mechanics or the philosophy of the automobile. But the automobile is only a component of transportation; information is a component of knowledge, the human mind and human communication. That is why it should be part of the expanded trivium for the same reason that grammar, logic and rhetoric were part of it originally: it is something fundamental to our humanness.

Some will assert that it is elitist to worry about information literacy when so much of the population, according to the new study Literacy, Economy and Society published by the Organization for Economic Co-operation and Development (OECD), is still non-functional in the areas of "pre-informational" prose literacy, document literacy and quantitative literacy - and when, as professors know, many college students cannot even write a passable term paper. But it is equally problematic - and elitist - to consign textual illiterates to the educational backwaters and reserve information literacy for those already in the know. As more and more information is in

computerized form, even elementary general literacy will be partially defined by an information-technology component.

Clearly, defining information literacy broadly, so as to constitute both a liberal as well as a technical art, and turning that definition into a curriculum are major challenges both intellectually and practically, and deserve extended discussion and collaboration among both educators and information-systems professionals, humanists, and computer and information scientists.

An Information Literacy Curriculum

Perhaps a brief sketch of such a curriculum, with emphasis on what is needed in higher education, will stimulate such discussion. This prototype curriculum attempts to encompass the old concept of "computer literacy" (remember "everyone should learn to program in BASIC"?), the librarians' notion of information literacy and a broader, critical conception of a more humanistic sort. Seven dimensions of literacy can be identified:

Tool literacy, or the ability to understand and use the practical and conceptual tools of current information technology, including software, hardware and multimedia, that are relevant to education and the areas of work and professional life that the individual expects to inhabit. This can be taken to include the basics of computer and network applications as well as fundamental concepts of algorithms, data structures, and network topologies and protocols.

Resource literacy, or the ability to understand the form, format, location and access methods of information resources, especially daily expanding networked information resources. This is practically identical with librarians' conceptions of information literacy, and includes concepts of the classification and organization of such resources.

Social-structural literacy, or knowing that and how information is socially situated and produced. This means knowing about how information fits into the life of groups; about the institutions and social networks - such as the universities, libraries, researcher communities, corporations, government agencies, community groups - that create and organize information and knowledge; and the social processes through which it is generated - such as the trajectory of publication of scholarly articles (peer review, etc.), the relationship between a Listserv and a shared interest group, or the audience served by a specialized library or Web site.

Research literacy, or the ability to understand and use the IT-based tools relevant to the work of today's researcher and scholar. For those in graduate education, this would include discipline-related computer software for quantitative analysis, qualitative analysis and simulation, as well as an understanding of the conceptual and analytical limitations of such software.

Publishing literacy, or the ability to format and publish research and ideas electronically, in textual and multimedia forms (including via World Wide Web, electronic mail and distribution lists, and CD-ROMs), to introduce them into the electronic public realm and the electronic community of scholars. Writing is always shaped by its tools and its audience. Computer tools and network audiences represent genuine changes in writing itself.

Emerging technology literacy, or the ability to ongoingly adapt to, understand, evaluate and make use of the continually emerging innovations in information technology so as not to be a prisoner of prior tools and resources, and to make intelligent decisions about the adoption of new ones. Clearly this includes understanding of the human, organizational and social context of technologies as well as criteria for their evaluation.

Critical literacy, or the ability to evaluate critically the intellectual, human and social strengths and weaknesses, potentials and limits, benefits and costs of information technologies. This would need to include a historical perspective (e.g. the connection between algorithmic thinking, formalization in mathematics, and the development of Western science and rationality and their limits); a philosophical perspective (current debates in the philosophy of technology, the critique of instrumental reason, the possibility and nature of artificial intelligence); a sociopolitical perspective (e.g. the impact of information technology on work, public policy issues in the development of a global information infrastructure); and a cultural perspective (e.g. current discussions of the virtual body and of the definition of human being as an information-processing machine).

New Goals for a New Society

Once we start to take information literacy seriously in this multi-dimensional sense, we have left far behind us the world of short courses on "Getting Started with Windows," "Surfing the Net" and "Bibliographic Instruction" (although clearly they have a role to play). We are really talking about a new curricular framework: one that equips people not only with a bunch of technical skills but with a broad, integrated and critical perspective on the contemporary world of knowledge and information, including its origins and developmental trends, its redefinitions of experience and social life, its philosophical justification, biases and limits, its potential for human emancipation and human domination, and for growth and destruction.

It used to be that, whatever a college graduate had majored in, she or he was supposed to know some important things about the emergence of modern society, including the scientific revolution of the 17th century and its major scientific, mathematical and philosophical legacies; the rise of capitalist industrial society and its critics; and the democratic revolutions. Also, it was hoped, she or he should know something about its major cultural landmarks: the literary monuments of secular, humanistic culture from Shakespeare through the modern novel, and the development of artistic and literary modernism as a response to the technological and social changes of the late 19th- and early 20th-centuries. This learning - the trivium and quadrivium of 20th-century culture - was supposed to make the individual an educated, autonomous member of contemporary society, with some context and framework for making meaning out of personal life and for participating in an informed and reflective way in public life.

Isn't it time to rethink what this educational goal means at the present juncture of the information society? Shouldn't understanding of network structures and politics be part of civics? Shouldn't people learn computer programming as much to become humanists as to become computer scientists? Shouldn't Turing's machine take its place next to Watt's machine in social science courses? Shouldn't algorithmic simulation be studied as a driving cultural force analogous to that of the scientific method? Shouldn't the dilemmas of existence in cyberspace and the media world be seen as analogues to those earlier generations confronted in Notes from the

Underground, The Wasteland, The Stranger and Endgame? We are reconstructing our lived-in world. What are we creating? And is anyone paying attention?

If the information society is to be a free and humane one - especially if we share the Enlightenment goals of abolishing unnecessary inequality and creating a society of liberty - then let us take up the challenge of Condorcet's vision. Let us contribute to liberty through advancing citizens' knowledge, through democratizing education. Let us design a comprehensive, multi-dimensional and thoughtful information literacy curriculum.

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