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Crossing digital divide--literacy as by-product of knowledge building

A challenge for a knowledge society is to increase the ability of individuals and groups in all sectors of society to create and work with knowledge. That the Internet is increasing rather than diminishing inequalities of opportunity and privilege is now a common concern. It is also generally recognized that there is more to the so-called "digital divide" than differences in Internet access and use. Neither is it simply a matter of differences in the knowledge and skills required for use of ICT. The best definition of the digital divide that we have seen is by Warschauer (2001, p. 1):

"The digital divide refers to social stratification due to unequal ability to access, adapt, and create knowledge via use of information and communication technologies."

The fundamental issue, then, is social stratification. Social stratification has existed throughout history and can have many sources. The new source is ICT, which can multiply people's knowledge and knowledge processing capabilities. Multipliers inexorably increase inequality, especially when there are cut-off points or thresholds, below which the new technology has no empowering capabilities. Multiplier inexorably increase inequality, especially when there are cut-off points or thresholds.

In the early days of the "War on Poverty" in the United States what we might now call an "analog divide" was discovered. Many poor people were not taking advantage of the public services already available. Providing them with telephones was thought to be a solution, allowing them to access government offices without having to leave home. However, when this proved to have little

effect, it was realized that extensive knowledge of governmental processes and structures was needed in order to know where to call and what to say. Today's "digital divide" involves the same kinds of knowledge of institutions and processes but much, much more. For example, while it is fairly easy to find information about a topic on the Internet, finding an answer to a specific question is often difficult--and finding an answer to an important question is usually extremely difficult. And so, empowerment through the Internet should really mean being able to seek out information that really matters. It also involves, as Warschauer indicates, the ability to adapt and create knowledge as well as find it. Very little attention is being given to these additional requirements; yet they are becoming the basis for increasing social stratification separating knowledge workers, or "symbolic analysts" (Reich, 2001), and the masses of people who may be able to use ICT but who cannot use it for knowledge building. The challenge for learning technology innovation, accordingly, is not merely to equip people with computer and media skills but to help them develop the wide-ranging capabilities that will enable them to gain full membership in the Knowledge Society.

Literacy has risen to prominence both as a human resource issue and as an equity issue—limited literacy has been identified as perhaps the most formidable barrier to crossing the so-called "digital divide." The literacy challenge is generally treated as one of bringing citizens up to an acceptable level of employability. This remains a challenge, even in countries like Canada that are doing relatively well by international standards. However, there is also the challenge of moving people whose reading is already functionally adequate up to levels that permit them to excel in knowledge work. The performance of even well-performing readers can be improved (Scardamalia, Bereiter, & Lamon, 1994; Bereiter & Bird, 1985; Rauenbusch & Bereiter, 1991). During the preceding quarter-century, impressive progress has been made in ways to improve reading comprehension—for instance, Reciprocal Teaching (Brown & Palinczar, 1989), Questioning the Author (Beck, et al., 1977), and cognitive strategy development (Pressley, 1999). Software for reading comprehension, however, has continued in

the traditional mode of teaching through testing: Learners read a text passage and answer questions about it.

Successful approaches all turn high-level control of the comprehension process over to the learner, whereas current practices keep students in a reactive mode while the teacher or software does the questioning and the comprehension monitoring (Bereiter & Scardamalia, 1987). A potential breakthrough exists, however, through software that supports the collaborative building of explanations (Scardamalia, Bereiter, Hewitt, & Webb, 1996) and through software that enables learners to monitor their own understanding (Kintsch, et al., in press). Reading comprehension is approached as the problem of constructing a coherent explanation of a text's content and implications relative to some authentic purpose. Text comprehension in this context is not an end in itself (which is the tacit and unrealistic assumption of conventional approaches) but serves purposes such as knowledge building, enhanced literary experience, and practical application. This approach is applicable to schooling at all levels and also to workplace literacy—where, for instance, the focus may be on understanding complex written instructions—and to overcoming the “digital divide”—where the focus may be on literacy to support social action and empowerment.

Students using Knowledge Forum have shown significant gains in literacy even without any special attention to it (Scardamalia, et al., 1992). Pilot studies, however, have indicated there is promise in using Knowledge Forum in a way that focuses on comprehending difficult texts. Texts are uploaded into Knowledge Forum and different groups of students engage in collaborative interpretation and analysis of text. Then the task becomes to craft “rise-above” notes and views that tie together meanings into more complete constructions. New work that is being undertaken in collaboration with scholars at the University of Colorado and Tamkang University in Taiwan will bring automatic text analysis tools into play that provide feedback to this process.

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