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## **Bridging the Second Digital Divide: What Can Sociologists of Education Contribute?**

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## INTRODUCTION

Poor and minority families and their children have less access to a range of resources in society. Thus it is not surprising to discover that the same pattern applies in the case of the emerging digital infrastructure represented in home, school, and workplace computers connected to the Internet. Although the Internet has become the fastest-growing technology in human history (Lebo 2000), as indicated by Attewell in this issue, poor and minority children are less likely to have access to computers and the Internet at home and at school (National Center for Education Statistics 2000), and their parents are less likely to have access to them at home and at work (U.S. Department of Commerce, 2000).

Although the basic disparities in access are not surprising, what is surprising, as Attewell noted, is the rapid response of the corporate and governmental sectors in calling attention to the problem and attempting to address it. Indeed, there has been sustained attention to the digital divide in terms of basic access to the Internet, and the attention shows no signs of diminishing. Attewell has used the growing interest in the disparities in access to computers and the Internet associated with social and economic conditions, the first digital divide, to call attention to the more important disparities in computer and Internet use, which he labeled "the second digital divide."

Here I want to consider two related issues and raise two challenges for sociologists of education. First, I argue that the way in which the disparities in access are addressed will have important implications for the evolving disparities in use. Second, I consider the difficulties of addressing the disparities in computer and Internet use in education. Third, I argue that sociologists of education have an important contribution to make in examining the disparities in use. Fourth, I call attention to the opportunity afforded by the emerging digital educational sector for those sociologists of education with an interest in solving educational problems instead of just bringing them to the attention of others.

## ADDRESSING THE ACCESS DIVIDE

There is ample reason to be concerned about the first digital divide. Not only have the disparities within major segments of the U.S. population been sustained and even widened as the Internet has spread, but there is also a wide gulf in access internationally that shows no signs of diminishing in the near term (Organization for Economic Cooperation and Development 2000). Perhaps more important, the efforts to address this divide carry with them the possibility of exacerbating the already visible disparities in use.

Understanding how and why efforts to improve access may create greater disparities in use requires that we consider the reasons the governmental and corporate sectors have been mobilized to address the problem. Both governmental and corporate proponents of improved access have mixed motives for doing so. Although both governmental and corporate leaders have voiced support for digital initiatives to improve education, they

have often cast these initiatives in limited economic terms. For example, in an address in East Palo Alto, California, in April 2000, former President Bill Clinton, after noting that there are people and places that have not fully participated in the new economy, spoke of visiting such places on his "New Markets Tours." Such speeches by governmental and business leaders often combine the call for opportunity with the need to create new workers and consumers. Clearly, leaders in all sectors have an interest in bringing those left behind by the digital revolution into the fold to allow not only for greater participation and individual opportunity, but for greater administrative efficiency (as when the Internal Revenue Service seeks to encourage more taxpayers to file electronically) or greater market penetration (as when businesses offer free computers and Internet connections in exchange for placing advertising on their screens) (Thierer 2000).

The rush to create more compliant citizens and more willing consumers by connecting them to the digital economy may lead to patterns of digital development that exacerbate disparities by both shaping what kind of computing students engage in and by disproportionately consuming resources that would be better put to other purposes. Each of these processes could make it more difficult to address the use divide even after we solve the access divide.

First, by targeting certain kinds of software and certain kinds of Internet connectivity toward less advantaged segments of the population, the push to solve the use divide may lead to the different patterns of use summarized by Attewell, whereby less advantaged children end up engaging in drill-and-practice at school and noneducational games at home, while their more affluent counterparts spend computer time in both venues involved in more creative and educationally stimulating activities. These patterns could be difficult to alter once they are established.

Second, attempts to extend technology to less affluent populations may displace other important activities by causing the reallocation of scarce resources to purchase technology. Purchasing computers and software in disadvantaged school districts consumes resources that are in short supply and that could be used to strengthen the overall school program. The relative cost of a computer is different in a district with a \$20,000 per-pupil budget than in a district with a \$4,000 per-pupil budget. Moreover, when less affluent school districts purchase computers to appear current but lack the basic staff training, facilities, and operating budgets to support appropriate computer use, the overall educational effort may be diminished. Gates (2000) raised a similar concern in the international arena in an address to the Digital Dividends Conference when he argued that investments in basic health care and literacy should take precedence over investments in technology in poorer countries.

Committing resources to address the access divide, whether from governmental or private sources, may lead to a speedier solution to the more visible divide, the problem of disparities in access, at the cost of intensifying the less visible problem of disparities in use.

## ADDRESSING BOTH DIVIDES

In thinking about the issues of access and use, it may seem logical to address the access divide before the use divide is considered. However, if we do not wish to heighten the disparities in the use of technology, we will need to address both access and use simultaneously. Doing so will require a more complex analysis of how investments in improving access can be balanced against investments to promote the most appropriate use to enhance students' learning. Achieving this balance presents a challenge for policy makers who may have to forgo highly visible access initiatives, typically based on physical infrastructure improvements, for less visible and more demanding efforts to encourage appropriate use by teachers and students, typically rooted in shaping complex social and educational structures and processes.

Determining when to expand computer and Internet access, and how, in different venues will not be easy. Moreover, it is both more important and more politically difficult to answer such questions in less affluent settings. It is more important because the margin for error, both financially and educationally, is smaller. A misallocation of resources in poor schools and districts can have an immediate negative impact on the educational opportunities for students, effects that in such settings cannot be easily compensated for by other school, family, and community resources. A truckload of computers delivered to a district without the resources to install, maintain, or prepare teachers to use them can weaken the overall school program by draining resources from other parts of the school program

It is more politically difficult to answer such questions in less affluent settings because the most appropriate educational decision may not be the most politically feasible one. Deciding to forgo the implementation of new technology in a poor school until more basic issues of staff development and curricular reform are addressed may be impossible if the lack of computers, a highly visible sign of progress, exposes the school to charges of inadequacy. When Gates (2000) told those assembled for the Digital Dividends Conference that such issues as health and literacy should take precedence over the introduction of personal computers in many areas of the world, he was quickly criticized. Educational leaders in poor schools and districts who attempt to defer the introduction of new technologies can surely expect the same response and more.

## SOCIOLOGICAL ANALYSES OF THE TWO DIVIDES

Sociologists of education have much to contribute to analyses of the emerging pattern of disparities in the use of technology in education. Digital technology is but the latest in a series of dimensions of the educational system that play a role in creating inequities in students' schooling experiences and learning outcomes. The well-developed theoretical and empirical approaches we have used to reveal earlier problems in schools and school systems serve well to orient a careful sociological analysis of the emerging role of technology in education. I suggest only a few potentially fruitful approaches here.

We know that examining issues of access is complex because questions of access are always multifaceted. Whether it is delivering a student or a computer to the schoolhouse door, we know that it is what happens after that point in institutional settings (e.g., Gamoran 1987) and in interpersonal ones (e.g., Rowan and Miracle 1983) that determines genuine access to knowledge.

We also know that the characteristics that students bring with them to school and to encounters with technology can play a significant role in their access to both. Differences in gender, race, ethnicity, language skills, culture, and economic background shape students' opportunities to benefit educationally. Moreover, we have found that students interacting with each other and technology in the classroom or on-line shape each other's experiences by extending or constraining chances for active learning (e.g., Cohen 1982; Schofield 1995).

We also know that the content, form, and structure of the curriculum have an impact on how individual students engage with it and their ultimate success in learning (e.g., Bernstein 1975; Eggleston 1977; Goodson 1992). We have learned that these same elements play a role in students' use of technology-mediated learning and that the form of the technology itself conveys lessons, lessons that only some will learn more easily than others. We know that the conditions under which students enter learning groups (e.g., Nault 1977), the internal structure of such groups (e.g., Simpson 1981), and the relationship of such groups to their external environments (e.g., Meyer 1970) can have an impact on students' attachment to the groups and their commitment to the learning goals. Students in technology-mediated groups are likely to be subject to the same effects (Smith and Kollock 1998). We have found that unless the multiple dimensions of educational settings and organizations are configured to support learning for all students, learning will not be equitably distributed (e.g., Cohen, Kepner, and Swanson 1995; Lee and Smith 1993). Technological initiatives that ignore the complexity of educational institutions will contribute to inequity just as other elements in schools have done.

We understand that the external forces that shape educational decisions have an impact on the ways in which technology will be configured in schools and which students will have access for which purposes (e.g., Aronowitz 2001; Mickelson 1999). We recognize that these external forces can overwhelm even the most well-configured internal arrangements for teaching and learning.

Although the introduction of digital technologies into educational settings represents a new era in education, it does not fundamentally change the social processes that substantially determine the impact of educational efforts. The analytic approaches that have been typically used by sociologists of education will do much to reveal the limitations and possibilities of the new technologies.

#### A ROLE FOR SOCIOLOGISTS OF EDUCATION

Finally, I want to suggest that the emerging digital revolution in society and education may demand new kinds of efforts by sociologists of education. In recent years, at least

some sociologists of education have become involved in the design of educational institutions and programs. Nevertheless, most sociologists of education have focused their energies on studying educational issues while leaving the task of creating and shaping educational institutions to policy makers and educators. Thus, most of us would not object to Attewell's statement that, "We must wait to see whether 'Let them have Pentiums' proves more practical than 'Let them eat cake.'"

The emergence of the new digital educational sector challenges all of us to use our considerable tools of analysis to design the new digital educational infrastructure. Perhaps not since the formation of systems of mass public education at the beginning of the industrial period has there been such an open field for those who would design and develop new arrangements for education (Murphy 2000). The rush to build new educational forms has been joined by a wide range of players, from entrepreneurs who are seeking returns on new investments, to policy makers who are seeking less costly and more effective ways to extend educational services, to educators who are captured by the thought of escaping the current educational bureaucracy, to parents who are seeking any means of obtaining a high-quality education for their children in a society in which education will play an ever-increasing role in determining well-being (Burbules and Callister 2000).

Sociologists of education are uniquely positioned to contribute designs for a range of new educational formations in the digital infrastructure. What will these new formations be? Undoubtedly, they will take many shapes, only some of which can be anticipated today.

There will be new digital libraries in which materials for scholarship and learning are assembled and made accessible for varied uses. The design of these libraries may determine the shape of knowledge in the future, as well as the patterns of its collection and distribution (Committee on an Information Technology Strategy 2000). Sociologists could inform designers of such libraries of the unintended barriers to access that certain designs may engender.

There will be on-line cooperatives among those pursuing knowledge and those wishing to share it. Distinctions between those at the forefront of inquiry and those who are entering study may be reduced as new channels of communication reduce physical barriers to the exchange of information. Sociologists could ensure that social barriers in new digital environments do not operate as effectively to limit knowledge sharing as have traditional physical barriers.

There will be extended forms of community of those brought together over great distances to work together to learn and to teach (Kim, 2000; Palloff and Pratt 1999; Rheingold 2000) There will be new versions of schools dedicated to extending knowledge to those who could otherwise acquire it only through more individual and less organized means (Illich 1971). Sociologists could map the structures of these communities and offer suggestions for improving opportunities for learning.

There will be work groups and associations devoted to building the digital infrastructure itself to facilitate certain kinds of education. Some of these groups will exist in corporations with distinct borders and hierarchical relationships that connect resources to human effort. Others will exist outside established corporate entities and rely on networking relationships with limited resources and voluntary association (Raymond 1999; Shapiro 1999). Sociologists could help such groups understand the alternatives and the trade-offs among them.

Together, these and other educational formations will constitute the new knowledge space (Levy 1999). The shape of that space, and the degree to which different groups in society have access not only to use it but to influence its growth and development, will be determined by the educational institutions that develop. Sociologists of education can play a significant role in designing the educational institutions of the digital age. Failure to engage at this defining juncture may appropriately lead to forfeiture of the right to criticize in the future. If we "Let them have Pentiums" without examining the likely consequences and acting to shape the changing educational sector of the information age to ensure truly equal access and use, we may be consigned to reprising the role of critic we have played so long in the industrial age.

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