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Of Digital Divides and Social Multipliers:

Combining Language and Technology for Human Development

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Combining Language and Technology for Human Development

The purpose of language teaching goes beyond memorization of grammar rules and vocabulary, or even the development of individual communication skills. Rather, the purpose is foreign language teaching, and indeed of any educational process, is to enhance the human and social development of students and their broader community (Warschauer, 2000, 2002).

This broader function of language education is one of the reasons why the use of technology in instruction can be so important. Through introduction of technology, language students can master the kinds of information and communications media that will allow them to use their new language in potentially powerful ways, such as for national and international communication, investigation and research knowledge production and dissemination, and publication of texts and multimedia documents (Shetzer & Warschauer, 2000).

This, then, begs the question of how technology is best introduced into language education, especially in contexts of socioeconomic disadvantage. Educators have long been concerned about an international *digital divide* between those individuals, communities, and nations with greater access to technology and those with lesser access (Bolt & Crawford, 2000; Warschauer, 2003b). What strategies are useful to overcome such divides and assist language learning with technology, for purposes of broader human and social development, in diverse socioeconomic contexts?

A common metaphor for approaching this question is the notion of a *bridge*—so as to *bridge the digital divide*. While this metaphor has some merit, it also is

problematic, because it suggests that we must reach across a chasm. However, those with lesser access to technology are not on the other side of a chasm, but rather of a continuum, and they have many individual and social resources that can be drawn up in their educational endeavors. I thus prefer the metaphor of *multiply*, especially since that is another way of contrasting with the term *divide*. I believe that educators should ask how we can use new technologies to draw and amplify the existing linguistic, educational, and other resources of individuals and their communities to foster greater development and social inclusion.

For the past decade, I have been conducting international research and project development related to the use of new technologies in language education projects, especially among marginalized or disadvantaged groups (for an overview, see Warschauer, 2003b). Some of this work has been in cooperation with other colleagues who have written for this book, and the chapters by Mounira Soliman and Fang Xu, both of whom I have collaborated with, reflect the multiplicative perspective that I emphasize. In this chapter, as the sole US contributor to this volume, I will focus in particular on three examples initiated in the US, with one example from an elementary school and two from universities.

Project *Fresa*¹

US primary and secondary education are badly divided, with relatively small number of students achieving well in school and the larger number suffering scholastic problems (Kozol, 1991; Noguera, 2001). These divisions in education are greatly impacted by language, with Spanish-speaking students near the bottom of most educational and social indicators (Cheng, 2001). For this reason, language instruction

among Spanish-speaking students is a high priority. This takes place through both English-as-a-Second-Language (ESL) programs and bilingual education programs.

For the most part, technology is poorly used in elementary and secondary ESL or bilingual education programs (Warschauer, 2003a). Students in these programs, as in other programs that are considered remedial, most frequently use computers for isolated drill-and-practice exercises, with little opportunity to use technology in more empowering ways (see discussion in Becker, 2000). Many believe that ESL students do not have requisite language skills to undertake authentic research, communication, or publishing tasks with computers.

Two teachers at Mar Vista Elementary School, in Oxnard, California. They have organized a curricular project for their bilingual education students called Project *Fresa*, or Strawberry Project, which integrates high levels of authentic communication and knowledge production with mastery of new technologies.

The project takes as its main focus the local strawberry (*fresa*, in Spanish) industry. The students in the two classes are almost all children of Spanish-speaking migrant workers in the strawberry farms that surround the school. The children begin the project by formulating their own research questions about the conditions of strawberry workers. They then use these research questions to generate interview and survey questions, enrolling their family members, relatives, and neighbors as respondents. They usually conduct the interviews in Spanish and then translate responses into English. Afterwards, the students learn to record in spreadsheets and to produce graphs in various formats of the data they have gathered (analyzing, for example, which types of graphs

best display what types of information). The graphs are incorporated into PowerPoint presentations together with photos and quotations from the people they have interviewed.

With the guidance of the teachers, they then search for further information about the conditions of strawberry workers on the Internet. They also invite guest speakers into their classroom from environmental and workers' rights groups. Based on the information obtained from the Internet and guest speakers, students write letters via e-mail to the strawberry growers expressing any concerns they might have about strawberry workers' rights. In past years they have also sent e-mails to elected officials, such as the state governor, with real and informed inquiries about agricultural laborers' rights. After engaging in this kind of work, they then begin an e-mail exchange with children in Puerto Rico who live in a coffee growing area to compare notes about the two industries and the condition of workers. At the end of the year, the students at Mar Vista hold a public presentation, to which their parents and other community members are invited to view the multimedia products they have created.

Compared with the using computer for drills and exercises, this kind of project-based teaching has several strengths. Students learn to actively master technology, rather than use it in a passive manner. They engage in their own research, data collection, analysis, and interpretation, and produce quality products such as letters to elected officials and data-based presentations. They also learn to speak out and take action on issues of importance to their community. Through gathering and evaluating information from a variety of sources, including workers, non-governmental organizations, businesses, and politicians, students involved in Project Fresa gain a better understanding of how different players shape the strawberry industry and the conditions of its workers.

Language learning is a central element of the entire process, but language, and technology, are viewed as means to important ends—increasing the students’ and community’s knowledge and power—rather than as ends in themselves. Nevertheless, there is a great deal of focus on language throughout, with teachers providing scaffolding and assistance at the point of need. Whether in helping students formulate research questions, write letters to growers, or understand presentations by guest speakers, the teachers contribute linguistic support throughout the project.

Perhaps most interestingly, this project was carried out with only a single computer in each classroom. The teachers had students work in groups, with one group at the computer and other groups carrying out different tasks. Students at the computer drafted their writing collaboratively, or keyed in work that had been written by hand elsewhere. The project thus demonstrated that *high-touch* (learning that touches students’ lives and motivates) can be more important than *high-tech* (having large amounts of advanced equipment) in integrating technology in the language classroom.

Hawaiian Multimedia²

A second example, drawing on many of the same principles as that above, took place in a Hawaiian language class at the University of Hawai’i. Hawaiian was formerly the national language of the sovereign nation of Hawai’i, but the language and its speakers were badly repressed by the US government after the US overthrew of the Hawaiian monarchy at the end of the 19th century (Wilson, 1998). With almost no native speakers of Hawaiian left in the islands, Hawaiian youth have recently begun a language revitalization movement to protect their heritage and culture. Hawaiian is now taught in schools and universities throughout the state of Hawai’i, and most of the students in the

courses are those with Hawaiian or part-Hawaiian ancestry (a group encompassing some 20% of the state's population.)

Students in this university class, and in Many Hawaiian language programs in the state make extensive use of new technologies (see Warschauer & Donaghy, 1997). The purpose of this is multifold. First, computer-mediated communication provides opportunities for learners of Hawaiian—who are small in number and spread out over several islands—to interact with each other. Students in this class, for example, had an e-mail exchange with community college students on the other side of the island of O'ahu. Second, technology, through, for example, electronic archives of native speaker video, can help preserve the few elderly voices who still speak the language fluently. Third, with Hawaiian groups lacking funding for other media (such as newspapers, radio programs, or television programs), or even for the publication of large numbers of books, online materials serve as an important source of community information and authentic language resources.

It was this last purpose that motivated a major project of the class. Students worked as a group to create a Website that reported on the history, culture, and current affairs of the Hawaiian people. Pages they created covered issues such as Hawaiian sacred chants, the 19th century Hawaiian monarchy, and a sociolinguistic overview of Hawaiian Creole English. All Web pages were written in the Hawaiian language, and students devoted great care to both the language and design of their sites as they recognized they were creating a valuable resource for the broader Hawaiian-speaking community. Work on the Web pages was supplemented with an e-mail exchange with other Hawaiian-language students at a community college across the island.

Sharing Stories³

A third example comes from a French language course at the University of California, Berkeley. Students in the class, almost all of whom were either immigrants themselves or children of immigrants, carried out an online exchange with a group of students in a working-class community in France. The latter group were almost all immigrants or children of immigrants as well. The students discussed and debated a number of themes related to immigration, culture, and identity with their online partners (alternating between French and English, so that both classes could practice their language skills.) Based on information gathered in the discussions, students wrote a series of essays, which they also shared with their exchange partners for further comment. These included a descriptive essay about the lives of their family today, a narrative essay about the historical roots and immigration of their family, and an argumentative essay about what it means to be an immigrant. Students thus had ample opportunity for authentic communication in their target language, while also tackling important cultural issues related to their own identity and to the identities of speakers of their language of study.

Common Themes

What, then, are some common themes that have arisen in these three projects, and others like them (for further examples, see Barson, Frommer, & Schwartz, 1993; Feldman, 1995; Jor, 1995; Richard Kern, 1995; Livesy & Tudoreanu, 1995; Meskill & Rangelova, 1995; Shetzer & Warschauer, 2001; Soh & Soon, 1991; Thalman & Vilmi, 1995; Vilmi, 1995; Warschauer, Shetzer, & Meloni, 2000) and how do they relate to the issues raised in the beginning of this paper?

In these three cases, technology is being used to multiply the opportunities for groups that are often at the margins of US society—recent immigrants and indigenous people. This multiplicative effect took place in several ways. First, students were drawing on their own cultural and social resources, for example, the knowledge that existed in their family and community about their social conditions. This knowledge was multiplied through the technology-enhanced activities of the project—whether they be digital audio-recording and photography of community contexts, uses of technology to analyze community-based data, or sharing of knowledge with others in the community through digital presentations and Websites. This is a key element that is central to effect use of new technologies with marginalized groups and communities throughout the world, both in education and other realms (see discussion in Warschauer, 2003b): technology must be used in ways that can build on and maximize the pre-existing strengths and resources of the community, including their knowledge, values, and community ties.

Technology is also often used to place a group in contact with distant exchange partners. This can help multiply students' opportunities of understanding, even of their own cultural values. As Bakhtin (1986) explained,

In the realm of culture, outsidership is a most powerful factor in understanding. It is only in the eyes of another culture that foreign culture reveals itself fully and profoundly...A meaning only reveals its depths once it has encountered and come into contact with another, foreign meaning: they engage in a kind of dialogue, which surmounts the closedness and one-sidedness of these particular meaning, these cultures. We raise new questions for a foreign culture, ones that it did not

raise itself; we seek answers to our own questions in it; and the foreign culture responds to us by revealing to us its new aspects and new semantic depths (p. 7).

These projects also involved communication and interaction with others.

In addition, the mastery of technology that is built into such projects multiplies the real life skills that students get out of the course. As one of the students in the above-mentioned Hawaiian course explained to me, “It's like a double advantage for us, we're learning how to use new tools, like new technology and new tools, at the same time we're doing it in Hawaiian language, and so we get to learn two things at once.” This principle—active mastery of technology rather than passive use—has been key to progressive education projects going back over the last century, most prominently in Freinet’s Modern School Movement in France (Cummins & Sayers, 1995; Freinet, 1974).

Also, students’ sense of agency, power, and motivation is multiplied as they learn that they can use the Internet not only to surf the Web but also to “make waves (Shneiderman, 1997, p. vii)—that is, to put forth their own individual and community perspective and attempt to make a difference in the world. This is consistent with the perspective on literacy put forth by Freire, who emphasized that students must learn to read and write the world in addition to reading the word (Freire & Macedo, 1987)

Finally, it is important to point out that students’ also achieve specific linguistic benefits from this type of interaction. The research and communication involved puts them in touch with many authentic texts (and, in some cases, native-speaking correspondents), both of which can assist their language development. Kern (1996), for example, in writing about the French-English e-mail exchanged described above,

discusses how students learned for the first time how French people actually distinguish between using the *Tu* and *Vous* forms in authentic interaction.

Students' writing for publication, and interaction with others about their online writing, also helps sharpen their language, as students revise their work in response to feed back, or attend to detail merely in anticipation of publication. As Volosinov (cited in Warschauer, 1997, p. 482) explained "Words, intonations, and inner-word gestures that have undergone the experience of outward expression" acquire "a high social polish and lustre by the effect of reactions and responses, resistance or support, on the part of a social audience."

Also, students participating in online exchanges have opportunities to notice, save, archive, and re-use expressions that others have used, thus facilitating a learning through incorporation of collated words known as lexical phrases. Research has found that in online exchanges students learners acquire chunks of unanalyzed language that they then put to productive use, a process that can lead students to master similar patterns (Bolander, 1989; Wong-Fillmore, 1976). This has led Weinert (1995) to conclude that

"lexical phrases" which exist somewhere between grammar and the lexicon may be given a more central role in language teaching and may provide a suitable compromise between approaches which rely too heavily on either the notion of linguistic competence or communicative competence"(p. 199).

In summary then, students are also provided opportunities to multiply their authentic uses of language and corresponding linguistic knowledge and skill.

Conclusion

In an era of globalization, mastery of international languages—especially English—and of new information and communication technologies is critical for diverse people to have a full voice in social and economic affairs. Fortunately, language and technology can be well integrated to multiply students’ linguistic, educational, and social advantages. The key element in this is not necessarily the number of computers in the classroom but rather how they are best used to amplify students’ own individual and collective resources. These resources include their own sense of identity, their values and history as members of a community, and their desire to cross cultures to make their views known and to learn from others. To achieve this multiplicative effect, students should be viewed not as *behind a screen* but rather *in front of a keyboard* (Pimienta, 2002)—in other words, ready and able to use their linguistic, technological, and social resources, with necessary scaffolding from the teacher and in collaboration with class or distant partners, to assert their voice in the world.

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Notes

¹ I discussed this project previously in Warschauer (2003b).

² My research on this project was presented in Warschauer (1999)

³ This project was discussed in an article by Kern (1996), in my edited book, *Telecollaboration in Foreign Language Teaching*.

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