COMMENTARY

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Electronic media are coming into more widespread use in education, and movements for indigenous language revitalization are simultaneously gaining momentum. So it is not surprising that integrating technology into revitalization efforts is growing in many places, and descriptions of such integrations are gaining visibility as well. The annual conferences on indigenous language co-sponsored by Northern Arizona University (and subsequently published in widely used volumes) highlighted the contributions of technology in 2001 (http://jan.ucc.nau.edu/~jar/TIL.html). The splendid new book, *The Green Book of Language Revitalization in Practice,* edited by Leanne Hinton and the since deceased and deeply mourned Kenneth Hale (2001), includes an 80-page section on technology in its 400+ pages. And now we have this theme issue of a specialized journal in the field. It is an expression of, and tribute to, the sharing of experiences among indigenous communities across tribal and national boundaries that all three of these sources are international in scope.

One can categorize the potential uses of technology for language learning in many ways. One simple cut focuses on what the technology creates: language *materials,* or *contexts* for language use, or both. In the *materials* category, Villa reports how a native speaker of Navajo gained sufficient computer skills to create CD-ROMs of "authentic" intergenerational interaction, and Edwards and colleagues describe shareware that can be used for creating bilingual books in many languages. In the *contexts* category, Auld describes an unusual communal setting in a remote Aboriginal community in Australia where up to four generations gather around a touch screen displaying a "talking book." As in projects described in other articles, Aboriginal speakers participate in the creation (with digital cameras) of these books-on-screen as well as their use.

Auld suggests a more fine-grained differentiation between computer as *tutor* and as *tool* and then among three kinds of *tools.* Historically, tutoring was the first role, with the computer substituting for a teacher in the now-classic three-part instructional sequence: presenting a task, accepting the student's response, and evaluating it. As computer capabilities have increased, and instructional philosophies have shifted from just transmitting a pre-set curriculum to also supporting learners' purposes, the role of computer as *tool* has become more prominent. Auld further distinguishes three kinds of tool use: a *conjectural* role stimulating critical evaluation, an *emancipatory* role empowering the user, and a *collaborative* role among users in a computer-mediated environment.

All these articles assume, explicitly or implicitly, that decisions about computer use -- like educational decisions more generally -- are made, or should be made, within the indigenous community. But that said, wide variations and tough issues remain. Jancewicz and MacKenzie compare the use of resources in Naskapi and East Cree communities, similar in many ways including the special problem of syllabic orthographies, that led one to emphasize use in the workplace, the other in schools. Haag and Coston relate shifts in computer use over time in a Choctaw community to shifts in its governance and leadership. Several of the articles argue for incorporating computers into indigenous language programs for the symbolic value of demonstrating, especially to young people, that learning their heritage language is for more than preserving the past, but there may well be opinions within a community against, as well as for, that value.

For material developers, this is a fundamental issue. I have put Villa's use of the adjective "authentic" in quotation marks not at all to question the authenticity of his materials but to call attention to issues embodied in that loaded word. Villa defines "authentic materials" as "original texts, films, and recordings

of language usage … that accurately reflect how a language community employs its heritage tongue," and a CD-ROM of naturally-flowing intergenerational conversation fits that definition. But the language games accompanying the Yupik bilingual CD-ROM, "How the Crane got Blue Eyes," produced by the school district in southwest Alaska discussed by McHenry, do not fit that definition. And neither would materials created for, say, math lessons in some other partial or full immersion program. Materials embodying and supporting both authentic and non-authentic language use can have significant educational value. It all depends on the program's governing purpose and values.

The special defining conditions of language revitalization programs may make the exclusive use of authentic materials impossible. In one oft-cited metaphor, the collective language resources of any community will be a leaky bucket in need of endless refilling unless or until the community's youngest members are learning that language in the home. Realistically, many young parents are themselves not fluent speakers, and so some non-authentic ("non-natural") forms of support, electronic or not, are needed. Maori researcher Margie Hohepa (1998) documents the benefits when young children carry little indigenous language books from school to home. Non-authentic in the sense that Maori elders speak of theirs as an "oral" culture (despite widespread Maori literacy in the 19th Century), the books contain mature language models for parents to read aloud and converse about with their child.

Two non-indigenous scholars who have devoted their professional careers to the revitalization movement, Michael Krauss and Joshua Fishman, stress the crucial importance of such inter-generational transmission. Several of the authors echo that concern, and Villa explicitly states, "Computers cannot become a surrogate for one generation of minority language speakers passing that tongue to subsequent generations." There is much to be learned from these articles about how computers can contribute *support* for oral face-to-face transmission, as long as there is at least equal attention to preventing them becoming a *substitute* for it.

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