Native American technology access: the Gates Foundation in Four Corners

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Abstract

The Bill & Melinda Gates Foundation's Native American Access to Technology Program (NAATP) was designed to provide computer and Internet access to Native peoples in the Four Corners area of the USA. Through this multi-year effort, complex packages of hardware, software, installation and training have been made available to 43 tribes in 161 settings. An intensive, collaborative process resulted in a package carefully designed to fit tribal interests, circumstances and political arrangements, including multimedia (graphics-intensive) equipment, language preservation software, and satellite connections to the Internet as necessary. This interim assessment concludes that the program has substantially increased tribal access to computing and information and has often fostered creative use of the technologies. Deeply embedded economic and political realities and their legacies remain, however, with substantial immediate and long-term consequences.

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Introduction

As the world we all share becomes increasingly dependent on technology, certain stories about Native Americans and their circumstances are so telling that they become iconic: take Myra Jodie, for example, a Navajo teenager, selected randomly from 25,000 contest entrants to receive an Apple iMac computer in 2000. The San Jose-based contest sponsors expected that this gift would enable the winner to connect to the Internet, but, when they finally were able to contact Myra, calling her at school to tell her what she had won, because her entry did not include a home telephone number, they found out that she did not know anything about iMacs, or about Apple computers. More than that, Myra had no phone at home – and lived ten miles from the nearest pay phone. An expensive, extended line would be needed for Myra's family to have a phone, and even then they might be unable to afford it (Reid, 2000).

Similarly, on a visit to Arizona in 2002, we came upon a woman who was delighted that a "Lifeline" phone service now reduced the cost of phone service sufficiently for her to be able to afford to have a cell phone in her hogan, a traditional Navajo dwelling. But we learned that, when the battery runs out, she has to walk several miles to recharge the phone, because she has neither electricity nor transportation available to her.

It was in the context of this impoverished-environment, lacking the fundamental infrastructure to support technology access, that the Bill & Melinda Gates Foundation[1] chose to adapt their US Library program so that it could provide access to technology to the many Native American tribes in the Four Corners region of the USA.

Beginning in 1997, the Gates Foundation's largest technology initiative, the US Library Program[2], has sought to increase access to technology throughout the USA by equipping more than 10,000 public libraries with computing "packages" consisting of a rich assortment of hardware, software, installation, training and ongoing technical assistance. "Packages" rather than "computers" is an important distinction in describing the US Library Program, because our assessments have demonstrated repeatedly that facets other than computers themselves, including detailed preparatory activity before the equipment arrives, an array

of software, in-person visits by the Gates staff, training, and ongoing technical support were often critical in the success of the program. This program has reached into communities, large and small – providing free access to computer technologies and the Internet for poor citizens through public libraries, and enhancing the visibility and viability of libraries throughout the country (Gordon et al., 2003)[3].

The US Library Program developed a strategy that involved their installing computer packages in public libraries in about one additional state each month over four years, with the intention of providing computer access to people in communities throughout each state. But it was apparent from the beginning that relying on public libraries was an insufficient response to the technology needs of Native American communities, especially those living in the south-west USA with large reservations and few public libraries. Moreover, the opportunities for digital resources required packages of computers and connectivity solutions especially crafted for the environment in which Native Americans live – a challenge which the Foundation decided to accept by designing and implementing a special Native American access to technology program (NAATP)[4]. The NAATP required a considerable departure from the US Library Program in substance and style, and a protracted educational opportunity on all sides.

Access to technology

The need among Native Americans in the south-west USA is enormous, and the levels of disconnection dramatic even when compared with other isolated parts of the USA. For example, while the telephone penetration rate was 94.6 per cent in US households in 2000 (up from 93.3 per cent in 1990), it was only 37.4 per cent in Navajo Nation households (up from 22 per cent in 1990)[5]. According to a report from New Mexico State University in 1999, 15 per cent of Native American homes in areas with 2,500 people or more have computer access (14 per cent in more rural areas), and only 10 per cent have Internet access (8 per cent rural) (Riley et al., 1999)[6]. Per capita Native American

income lagged others in the USA dramatically by many measures in 1990, while unemployment was more than double the US average (Casey et al., 1999). (see Table I).

While public libraries provide excellent opportunities to increase access in most states, even in very rural areas (Heuertz et al., 2003), they are wholly inadequate in Indian country. The Navajo Nation, with a population of 180,462 encompassing 26,867 square miles and crossing state boundaries, has only one tribally run public library, the Navajo Nation Library in Window Rock, Arizona. One branch library, of the Farmington Public Library system, is located in Shiprock, New Mexico; another, a branch of the Coconino County Library System, is in Tuba City, Arizona. For all the 49 tribes in the Four Corners states, there are 36 tribal libraries recognized by their state library system (Table II).

Implementation of NAATP

In preparation for initial installations in the Four Corners area, Gates Library Program leadership and staff held initial conversations with tribal representatives and with administrators from state-run public libraries in the region. Issues which distinguished these settings from those in the US Library Program needed to be considered in detail. From the beginning, for example, tribal representatives' desire for native children to have ready access to the latest technologies was coupled with the fear that technology would only further distance the children from their native roots and culture. Foundation staff decided to begin with five weeks of summer camps held in the Navajo Nation and in New Mexico Pueblos utilizing a mobile lab both to demonstrate the capability of the technology, and to learn what program design would best serve the diverse needs of tribal groups. The summer program was designed to appeal both to tribal elders and to Native children, with a special emphasis on the arts and project-based learning. The Gates staff had anticipated that they were not sufficiently aware of the requirements and opportunities afforded by the Native American settings, and soon learned how right they were. The mutual learning and joint planning sessions that first

Table I Economic profile of Native Americans

	Native American	USA
Per capita income ($)	8,234	14,420
Per capita income of American Indians on reservations or trust lands ($)	4,478	
Unemployment rate (%)	14.4	6.3
Poverty rate (%)	31.0	13.0
Median family income ($)	21,750	35,225
Median married-couple family income ($)	28,287	39,584
Median income for families maintained by a female householder with no husband present ($)	10,724	17,414

Note: 1990 Census statistics excerpted from Casey et al. (1999)

Table II Distribution of tribes and tribal libraries in Four Corners, 2001

State	Number of tribes	Number of tribes with state-recognized tribal libraries	Number of state-recognized tribal libraries
New Mexico	21	9	10
Arizona	21	15	21
Colorado	2	1	1
Utah	5	1	1

summer led to the development of an appropriate computer model and training strategy, and it was through these experiences that the Gates staff began to understand how best to work within these communities.

As a result of what they learned, the Foundation decided to focus on the Four Corners region of the USA (in Arizona, Utah, Colorado, and New Mexico), and crafted a program which they hoped would honor Native wishes and respect existing institutional arrangements, while providing widespread public access for Native Americans in the region. (Additional access for other Native peoples is available through other Gates Foundation activities – for example, to the First Nations people through the Canadian Library Program (Erickson, 2002), and to indigenous communities in Chile and Mexico through their International Library Initiatives.) The Foundation decided to offer non-competitive grants to every tribal entity in the Four Corners area, engaging in a collaborative process which enabled the tribes to propose how best to serve public access needs while respecting tribal integrity, and enabling the Foundation to respond with an appropriate array of equipment and resources (Sirois et al., 2001).

The package was designed to enhance the opportunities for technology training and to provide access to computers and to the Internet (Dorr and Akeroyd, 2001). As in the US Library Program, the "package" is far more than equipment, and includes detailed preparatory work, installation, training, and technical support[3]. Tribes have received workstations and servers, laser printers, digital cameras, and whatever has been required for Internet connectivity – designed to fit local circumstances. The array of software has varied over time as more is learned about appropriate materials, but has included:

- publication and office productivity titles (Microsoft FrontPage, Publisher, Word, PowerPoint, Excel, Access);
- reference material (dictionaries and atlases, encyclopedias, including *Encarta Africana*); and
- children's games and educational software (the Magic Bus series, the Arthur series, Algebra and Geometry tutors).

For computers granted to the Navajo Nation, two Navajo language programs were included. In response to the requests and emphases from the tribes, the package also includes multimedia tools (Adobe Photoshop and Illustrator, GIF Animator, Real Networks RealPlayer and RealProducer) and a year's subscription to ProQuest's Ethnic NewsWatch – an online database that includes Native publications.

Foundation staff also faced many obstacles in connecting all granted computers to the Internet. They worked individually with each tribe to determine how connectivity could most effectively be achieved and sustained, and granted funding for the installation of dedicated connections, from T-1 and frame relay to wireless and satellite, as appropriate. Some sites (typically because of their proximity to major cities) had solid telecommunications infrastructures on which the foundation could build. Many sites, in isolated rural areas, did not even have land-lines that could be used for dial-up connections.

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The isolation from appropriate telecommunications infrastructure meant that many of these settings could only be connected to the Internet via satellite. The choice among satellite vendors was left to the Navajo Nation, who ultimately chose OnSat Network Communications[7]. OnSat then worked closely with the Gates Foundation telecommunications staff to design and deploy the best available satellite technology for these purposes.

Now 43 tribes in the Arizona, New Mexico, Colorado and Utah area are participating in the Gates NAATP program (see Appendix for a complete list of participating tribes). Equipment has been installed in all the 161 settings (111 in the Navajo Nation alone), only 21 of which are libraries. More than 100 of these sites required satellite equipment in order to be connected to the Internet. To date, the Gates Foundation has spent about $6.9 million on this program.

Preliminary assessment of NAATP

The evaluation of the NAATP program is still under way, and final conclusions must await additional data, including another series of surveys, visits and interviews. Based on the information we have gathered thus far, we can offer the following tentative conclusions about the scope and impact of this program:

- The Gates Foundation's Native American Access to Technology program has dramatically increased the amount of computer and Internet access available to Native Americans in the Four Corners area. Many other organizations (e.g. non-governmental organizations, educational institutions) have also worked to provide technology access to tribes in the Four Corners – often building on long-standing tribal relations which result in finely tuned, sensitively deployed technology. But the sheer size of the Gates NAATP effort with its range of available materials – including educational and productivity software, as well as language preservation materials, and substantial multimedia enhancements (e.g. Adobe Photoshop and other graphics and sound packages, together with digital cameras, scanners and related equipment) – has meant that equipment that was otherwise unaffordable is now in the hands of many people for whom it would otherwise be unavailable.
- The extended collaboration process, involving several tribes and Gates Foundation representatives, proved invaluable in designing an appropriate program. Through the planning meetings, trial computers, summer camps and continually revised resources, benefits have accrued to all parties: tribes, particularly those with little previous experience with computing, increased their awareness of the potential of these technologies. Foundation gained a much greater understanding of how most effectively to respond to the issues faced by rural, tribal communities whose vision is remarkable, but whose resources are severely limited.
- In many settings, the technology is very heavily utilized, especially by children. Waiting lines are often encountered, especially now that reliable satellite connections have been established throughout the program sites.
- Young Native males are frequent users of these technologies, and often help others learn and improve their skills as well.

Since young males are often regarded (and regard themselves) as marginalized in contemporary tribal settings, this is an accomplishment worth noting and building on.

- Collaborations and partnerships have frequently allowed the tribes to leverage the resources provided through the Gates Foundation. Some examples: the Jemez Pueblo Community Library has partnered with the Department of Labor Employment Services to add job search information to the Gates computers, and utilizes a wireless network to connect to a land-line at the Jemez Day School. The Pueblo of Santo Domingo received a grant from the Department of Housing and Urban Development to supplement their Gates computers. Many OnSat satellite connections also enable wireless Internet access for neighboring Head Start centers, which would not be possible, were it not for the initial connections provided through the Gates program.

- As in the US Library program, the largest numbers of people utilize the computers for "traditional" computer purposes, such as e-mail, word processing and children's programs.

- The array of hardware and software supplied in response to the vision of tribal members clearly distinguishes the NAATP program. Some of this equipment has had widespread impact, but some has had very little. The multimedia programs, for example, (Adobe Photoshop, etc.) have been used by a small but dedicated number of people in several sites. The language and cultural preservation tools that were eagerly anticipated and lobbied for by tribal representatives from the inception of this program have been used only occasionally. Our observation is that they are more frequently used by outsiders (e.g. missionaries attempting to learn the Navajo language) except in a few settings (e.g. cultural centers with strong language programs) where previous experience prepared them to take advantage of this complex software.

- Formal training classes have been provided less frequently than anticipated, and far less frequently than in public libraries. One-on-one tutoring appears to be the preferred method for teaching and for learning.

- The few public libraries that were available to Native Americans in the Four Corners area are among the most successful installations in providing public access. Their computers were more likely to be visible, operational, and placed in "welcoming" locations. Classes were more likely to be taught, and patron questions answered, by eager staff. Potential Native public access users in several non-library locations have reported feeling less than welcome, as if they were not part of the "in-crowd". In non-library locations, the physical location of the building housing the computers, and the dedication of staff and tribal leadership to the idea of public access computing, also proved to be key to successful implementations.

- From our perspective, reliance on satellites for Internet connections is best regarded as an interim step rather than an ultimate solution. The deployment of satellite connectivity was an admirable but expensive vehicle for providing access when no land-line infrastructure was available, but speed limitations, unreliable connections, high maintenance and continuous costs loom as hurdles still to be overcome.

- Through this process, many tribes have become excited about the potential of information technologies and digital resources for providing opportunities for their members. Tribes still struggle with the legacy of poverty, neglect and abuse, which sometimes overshadows technology planning and development. But tribal leaders often bring a careful and balanced perspective to their adoption of technology and, as the advantages of new information tools for education and economic development become apparent, we expect that the resources and support for technology planning and use will continue to grow.

Conclusions

Recall the woman described earlier who is unable to recharge her cell phone, and

Myra Jodie, who had no phone line for the computer she won. There is no doubt that increasing numbers of Native Americans now have dramatically improved access due to these NAATP facilities. There are many new success stories like the woman in Nageezi, New Mexico, for example, who no longer has to drive 50 miles on a round-trip to check her e-mail or to do class homework. Though her house still lacks electricity, public computers at Chapter houses now give her local access.

> **'... One of the most important consequences of the Myra Jodie story is that it became an occasion to focus national attention on the persistent issues in Native American country...'**

But it would be naïve to conclude that installations even of this magnitude change the fundamental economic plight of Native Americans in this country. Underlying economic, social, and political realities that led to the lack of infrastructure also hobbled better solutions to the problems of technology access for Native Americans, and those realities are still with us.

One of the most important consequences of the Myra Jodie story is that it became an occasion to focus national attention on the persistent issues in Native American country. Similarly, the Gates Foundation work has led to some immediate improvement, but the effort may be more important to the extent that it illustrates once again the strengths of Native American communities, maintained over years of hardship, disarray, and abuse, and the problems that still need to be solved.

Notes

1 Available at: www.gatesfoundation.org
2 Available at: www.gatesfoundation.org/Libraries/USLibraryProgram/
3 Available at: www.pacp.net/2003summary.html
4 Available at: www.gatesfoundation.org/Libraries/NativeAmericanAccessTechnology/
5 Available at: www.fcc.gov/Bureaus/Common_Caarrier/reports/FCC-State_Link/IAD/
6 Available at: http://12.39.209.165/Imagecache/EDAPublic/documents/pdfdocs/1g3_5f13_5fatinc_2epdf/v1/1g3_5f13_5fatinc.pdf
7 Available at: www.onsatnet.com/

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Appendix. Tribes participating in the Gates Foundation NAATP program

Arizona tribes
Ak-Chin Indian Community
Colorado River Indian Tribes
Fort McDowell Mohave-Apache Community
Gila River Indian Community
Hopi Tribe
Hualapai Indian Tribe
Kaibab Band of Paiute Indians
Navajo Nation
Pascua Yaqui Tribe
Quechan Tribe
Salt River Pima-Maricopa Indian Community
San Carlos Tribe
San Juan Southern Paiute Tribe
Tohono O'Odham Nation
Tonto Apache Tribe
Yavapai-Apache Nation
Yavapai-Prescott Tribe

New Mexico tribes
Pueblo of Acoma
Pueblo of Cochiti
Pueblo of Isleta

Pueblo of Jemez
Pueblo of Laguna
Pueblo of Nambe
Pueblo of Picuris
Pueblo of Pojoaque
Pueblo of San Felipe
Pueblo of San Ildefonso
Pueblo of San Juan
Pueblo of Sandia
Pueblo of Santa Ana
Pueblo of Santa Clara
Pueblo of Santo Domingo
Pueblo of Taos
Pueblo of Tesuque

Pueblo of Zia
Pueblo of Zuni
Jicarilla Apache Tribe
Mescalero Apache Tribe

Colorado tribes
Southern Ute Tribe
Ute Mountain Ute Tribe

Utah tribes
Northwestern Band of Shoshone
Paiute Indian Tribe of Utah
Ute Indian Tribe

Biography

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