SRI International

March 2001

THE ORGANIZATION OF LEARNING IN COMMUNITY TECHNOLOGY CENTERS: Learning with Technology in Six Communities

A paper to be presented at the Annual Meeting of the American Educational Research Association, April 10-14, 2001, Seattle, Washington.

Prepared by:

Bill Penuel, bpenuel@unix.sri.com
Vera Michalchik, vera.michalchik@sri.com
Deborah Y. Kim, debkim@stanford.edu
Linda Shear, linda.shear@sri.com

Report Contributors:

Melanie Daniels
Pamela Jenning
Regie Stites
Louise Yarnall
Joanne Hawkins
Rhandy Pacpaco

This research was sponsored by the U.S. Department of Education as part of a Task Order contract (ED-99-CO-0160) to MPR Associates develop an evaluation framework for the Community Technology Centers grant program within the Office of Vocational and Adult Education. The authors are responsible for all opinions expressed herein.

333 Ravenswood Avenue • Menlo Park, CA 94025-3493 • (650) 859-2000 • Fax: (650) 859-2861

EXECUTIVE SUMMARY

The growing gap in achievement between low- and middle-income students in the past decade and a widening opportunity gap in the workforce have coincided with the broad social and economic changes resulting from the development of new information technologies. In response to these changes, there has been a growing movement to establish community technology centers, community-based initiatives that work to enhance learning opportunities for low-income Americans through the use of computers and other technological tools.

The U.S. Department of Education's Community Technology Centers (CTC) program aims to promote the development of model programs that demonstrate the educational effectiveness of technology in urban and rural areas and economically distressed communities. Community technology centers funded through the program provide access to information technology and related learning services to children and adults. The CTC program supports these centers through 3-year grants awarded on a competitive basis to state educational agencies (SEAs), local educational agencies (LEAs), institutions of higher education, and other public and private nonprofit or for-profit agencies and organizations.

As part of developing an evaluation framework for the Community Technology Centers program, SRI conducted extended site visits in December 2000 and January 2001 to six CTC grantees across the United States. This report presents and synthesizes findings from these site visits. Each case describes the community served by the grantee's centers, the organization of educational programs, staffing and professional development patterns, partnerships that centers have developed with other organizations in their communities, and challenges faced by centers in start-up and program implementation. The final section of the report presents an analysis of program results and challenges common to the community technology centers that SRI visited.

Results of the cross-case analysis suggest that community technology centers provide important educational benefits to their communities. From preparing a community's citizens with skills they need for finding jobs to extending the time spent involved in learning activities for young children, community technology centers address educational needs across the lifespan. Specifically, the centers we visited showed evidence that they were making progress toward one or more of the following outcomes:

- The partnerships that community technology centers have developed increase family and community involvement in public schools.
- Center programs increase participants' self-efficacy with computers.
- Center activities prepare people for the workforce.

- After-school programs at centers extend the time that school-age children spend reading, writing, and solving mathematics problems.
- Activities for youth provide an engaging alternative to the traditional school learning environment.

At the same time, many of the centers face challenges related to start-up, program implementation, and sustainability. The challenges faced by many of the centers we visited include:

- Start-up takes longer than many programs expect.
- Centers have had trouble finding and developing local content and curriculum.
- Centers have struggled to keep up with the demand to stay open on weekends and holidays.
- Centers have not developed strategies for staff development.
- Centers are concerned about long-term sustainability.

The America Connects Consortium, funded by the U.S. Department of Education, is well positioned to provide technical assistance to community technology centers in the program and has already developed strategies to address many of these challenges. In addition, centers have a strong commitment to continuous improvement, and each of the centers SRI visited has undergone periodic review of programming and made adjustments to improve learning outcomes.

The research SRI has conducted to date suggests that the promise of community technology centers for expanding technology-supported learning opportunities is great. Centers we visited are extending learning beyond the school day for young people, providing critical job training to adults, and providing seniors with new ways to connect to family members and enrich their lives. At the same time, it is critical to continue to develop a comprehensive framework for evaluation that takes into account the diverse range of services provided and likely outcomes for youth and adults alike, so that the program can report to policy-makers on measurable results.

CONTENTS

1. Introduction

The gap in educational outcomes between low-income and middle-income students and between white and nonwhite students in America is receiving renewed attention among our nation's educators and policy-makers. There have been numerous calls from policy-makers across party lines for educational reforms aimed at boosting academic achievement for all students in K-12 education and at providing lifelong educational opportunities to increase the literacy and job skills of adults. In the past, we have looked primarily to classroom teachers and schools to effect reforms, but responsibility for improving educational opportunity for the least advantaged sectors of our population extends, in the minds of many, beyond the classroom. Families, faith-based groups, charities, and community organizations each have an important role to play in addressing educational inequalities in our country and in reshaping educational institutions for the future.

The growing gap in achievement between low- and middle-income students in the past decade and a widening opportunity gap in the workforce have coincided with the broad social and economic changes resulting from the development of new information technologies (see Castells, 2000). In response to these changes, there has been a growing movement to establish community technology centers, community-based organizations that work to enhance learning opportunities for low-income Americans through the use of computers and other technological tools. Depending on their focus, community technology centers help participants build any of a number of important academic and life skills. Table 1 shows the range of educational program goals that are typical of community technology centers across the United States.

Table 1. Types of Program Goals for Community Technology Centers

Access Goals: Provide computers and Internet access to a community that lacks these resources, or expand hours of public access to computers.
English Language Literacy Goals: Improve language skills to an immigrant community or a community with historically low English reading and writing skills.
Educational Goals: Improve academic achievement among school-age children or provide GED courses to adults.
Basic Computer Literacy Goals: Provide essential skills of computer usage, such as how to turn on the computer and how to use simple desktop tools and the Internet.
Advanced Technical Skills/Career Readiness Goals: Teach programming or use of specialized software tools that will offer new career opportunities, or provide a suite of programs to assist in job searches and business development.
Community Building/Empowerment Goals: Strengthen a community through improved communication and/or promoting involvement in local issues.

For young people, program offerings typically build on and extend the basic skills of reading, writing, and mathematics. Participants in community technology centers learn how to use and produce text, images, and other modes of representation made available through technological innovations. Participants at these centers also learn to operate, explore, and often even repair computers and other digital technologies in ways that they would have few opportunities for otherwise. For many low-income Americans, programs such as those provided by community technology centers are their primary means of accessing, learning from, and learning about digital technologies (U.S. Department of Commerce, 1999).

For adults and older youth, the learning opportunities provided by community technology centers are generally designed to prepare participants for the demands of the

workplace in the new economy. These programs typically provide both an introduction to advanced technical skills, often leading to special certification, and job readiness training and career counseling. Jobs in today's economy require understanding of information technologies and fluency with the productivity tools made available by computers. Community technology centers often provide programs designed to prepare workers to be thinkers, problem solvers, and decision-makers, skills that educational researchers and workplace ethnographers see as critical in contemporary workplaces (see Barley & Orr, 1997; Gee, 1997).

The U.S. Department of Education's Community Technology Centers (CTC) program is an initiative that supports a strategy for building bridges across income and ethnic divides to provide access to technology for the first time to thousands of Americans. Housed within the Office of Vocational and Adult Education, the program aims to promote the development of model programs that demonstrate the educational effectiveness of technology in urban and rural areas and economically distressed communities. Community technology centers funded through the program provide access to information technology and related learning services to children and adults. The U.S. Department of Education CTC program supports these centers through 3-year grants awarded on a competitive basis to state educational agencies (SEAs), local educational agencies (LEAs), institutions of higher education, and other public and private nonprofit or for-profit agencies and organizations.

Though the Community Technology Centers program is relatively new, first-year grantees (FY 1999) have already opened a number of new community technology access points and expanded access at existing centers with the support of grant funds in places where there are few opportunities for residents to use computers or access the Internet. Centers are extending opportunities to learn by providing children opportunities to engage in activities using various software that supports reading and math skill development during and after school. Centers are also providing adults with software and classes to learn the technical and professional skills necessary to acquire higher-paying jobs demanding technical fluency. Likewise, a number of grantees have developed successful partnerships with different types of agencies and organizations in the public

and private sectors, which tap into local innovation on how best to provide instruction that best fits their communities' needs. Many of these partners have provided educational programs to help community residents learn how to use technologies to increase their fluency with information technology, augment learning, or advance their careers, providing early evidence of the value of community technology centers for expanding educational opportunities to low-income Americans.

This study of six technology centers funded by the CTC program shows that, although no two centers are alike, they all are share two fundamental features. First, because they are rooted in their local communities, these centers are quick to respond to the diverse community needs and values their participants represent. Second, because there are few preexisting models of how they should operate, these centers are inventing new kinds of programming that are closely aligned with local needs and values but also distinct from the learning opportunities provided by traditional educational institutions. In this respect, community technology centers serve a unique function in the American educational system. The possibility that community technology centers can fill a gap in providing educational services to low-income Americans means that these centers can potentially help decrease the achievement gap the nation is working hard to confront. The close examination of community technology centers across America that is presented here provides insights into the promise of this new educational institution.

2. Approach to the Case Studies

Starting with the goal of maximizing geographic diversity, the researchers interviewed directors of approximately 40 centers located in 5 regions of the United States. Sites were screened to provide broad representation of the different types of programs offered, target populations, locations, and budget size. In November 2000, SRI presented a list of 12 candidate sites to the U.S. Department of Education. On the basis of feedback from CTC program administrators, six grantees were selected for study, all of which were funded in the 1999 grant cycle.

Table 2 below summarizes the ways the six sites differ with respect to four dimensions of SRI's taxonomy of community technology center programs: program goals, location or population type, target clients, and number of centers opened. Brief descriptions of each of the grantees appear below the table.

Table 2. Characteristics of Case Study Grantees

Grantee	Program Goals	Population Type	Target Clients	Number of Centers
United Way of the Midlands	Basic Computer Literacy Advanced Technical/ Career Skills	Small Urban Suburban	All ages	1 new
Armory Foundation	Basic Computer Literacy Academic Goals	Large Urban	School-age Adults (25-55) Seniors	1 expanded
East Bay Neighborhood Links	Academic Goals Advanced Technical/ Career Skills	Large Urban Suburban	School-age Adults (25-55)	3 new 2 expanded
Blackfoot School District 55	Basic Computer Literacy Academic Goals	Town Rural	School-age Adults (25-55)	3 new
Mott Community College	Basic Computer Literacy Access Advanced Technical/ Career Skills	Small Urban	School-age Adults (25-55)	3 new
Desert Sands USD	Basic Computer Literacy Academic Goals English Language Literacy	Town	School-age Adults (25-55) Families	2 new 4 expanded

Technology Learning Center @ the Armory (Armory Foundation), New York, NY. This community technology center serves the Dominican neighborhood of Washington Heights. A strong component of this program is its project-based approach to teaching basic technology skills to adults and youth.

Coronado and M. Robinson Baker YMCA, Street Tech, Urban Voice, and the Crescent Park Multi-Cultural Family Resource Center (East Bay Neighborhood Links), Oakland, CA. A collaborative sponsored by the YMCA of the East Bay, this program focuses on both adults and youth and has strong vocational education, job training, and placement components. The program serves primarily the African-American communities of West Oakland and South Richmond.

Family Technology Centers in Blackfoot (ID) and Fort Hall (ID) (Blackfoot School District 55), Blackfoot, ID. This center serves low-income community members living on the Fort Hall Reservation and in a farming community in Idaho. The program aims to provide academic supports to students to help them succeed in school, including a strong parent component. There are adult classes focused on basic computer skills and applications.

Fast Forward (United Way of the Midlands), Columbia, SC. This center, located in a local middle school, aims to increase technology literacy, improve job skills, and increase both personal self-sufficiency and sense of community for participants. The Fast Forward community technology center provides a range of programs for preschoolers, middle school students and their parents, and seniors in the community.

The Great Lakes Baptist District Center, the Disability Network Center, and the Hispanic Community Center (Mott Community College), Flint, MI. Mott Community College is establishing three technology centers designed to serve the African-American, disabled, and Hispanic communities in Flint. These three centers feed into a Regional Technology Center planned to prepare former manufacturing sector

workers for jobs in information technology. A Disability Network center is planned to have a regional effect on services for the disabled.

Digital Family Project (Desert Sands Unified School District), Indio, CA. This school-linked program leverages funds from the 21st Century Learning Center program. Its focus is on serving a largely Hispanic agricultural and hospitality industry community. Adult education and computer classes are offered, with a primary focus on literacy, improving home-school connections, and parent involvement.

Seven researchers, individually or in pairs, visited community technology centers operated by each of these six grantees for 3 days during December 2000 and January 2001. The research team prepared for the site visits by reviewing grantee applications and performance reports, obtaining additional information about the centers from center staff, and preparing in-depth interview protocols for use with center directors, program staff, stakeholders, and participants (see Appendix for sample of protocols used). Information gathered during site visits was entered into a comprehensive debriefing form to allow for a ready comparison and synthesis of issues across centers. The descriptions of centers in this case study report are not intended to reiterate or confirm information about the centers that is available through annual performance reports and other documentation. Rather, the descriptions are meant to highlight the centers' successes and challenges, to portray the types of learning and other experiences made possible by the centers, and to bring to life the distinctive characteristics of each center.

Each of the following cases describes the community served by the grantees' centers, the organization of educational programs, staffing and professional development patterns, partnerships that centers have developed with other organizations in their communities, and challenges faced by centers in start-up and program implementation. The final section of the report presents an analysis of program results and challenges common to the community technology centers SRI visited.

3. Fast Forward: A Diverse Community Moves from Access to Learning

The city of Columbia, South Carolina, is the area served by the Fast Forward community technology center at the Hand Middle School. Columbia used to be a center for textiles and manufacturing, but the last vestiges of the historic textile industry vanished from the city in the late 1990s, when the only remaining company moved its production facilities overseas. Today, the state government, an Army base, and a local state university are the three largest employers in this city of 100,000.

The city is a patchwork of neighborhoods that reflect different social and economic backgrounds of the city and its history. Just over half the population is white, and over 40% are African American. Although the largest employers offer positions for many professionals, just 10% of Columbia residents have white-collar jobs, and nearly half live in poverty. Many of the more affluent professionals live in the Shandon and Hampton neighborhoods, tree-lined areas with many stately brick homes. Until recently, the neighborhood was somewhat affordable by local standards; in the past few years, young professionals who work for the state government, university, and other programs have settled in the area and driven up real estate costs. Just a few miles away are Bluff Estates and Arthurtown, low-income neighborhoods that only recently have benefited from redevelopment efforts initiated by Habitat for Humanity, which has built some 30 homes in the area.

Hand Middle School, home to the Fast Forward community technology center, draws students from each of these neighborhoods. It is located in the Shandon neighborhood, but students also come from former mill worker villages, trailer parks, and historically African-American tracts that, in one case, only recently obtained running water. The challenges of meeting the educational needs of the diversity of children in the school are often framed in terms of access: access to basic needs of safety and security at home, access to transportation to and from school, and access to opportunity to learn and earn enough to achieve one's goals in life. Increasingly, however, at Hand and at the Fast Forward community technology center, educational leaders are recognizing the

importance of focusing on learning outcomes as they prepare children and adults for the world of the 21st century.

Encouraging the Intelligent Use of Computers

Dee Albritton, director of the Fast Forward community technology center, tells a story that illustrates the growing recognition of school leaders that access, especially to technology, is not enough. A few years ago, Albritton had developed a computer bank for low-income residents as part of another program. The program obtained donations of broken and outdated computer equipment from businesses, trained homeless people to make the repairs, and then donated the computers to low-income families. They set up learning centers at police substations that catered to youth and adults. Albritton noticed that as soon as she provided technology access, more training was needed to help residents learn how to use computers. "We've got lots of access," she said; "what you need is 'How do I use it?'"

One of the board members of Fast Forward, Scott Derks of Bank of America, sees the focus of Fast Forward as promoting the "intelligent use of computers." He had worked with Albritton on the earlier project and also suggested that an approach focused just on providing technology access failed to foster broader computer use. In a needs assessment conducted for the school before writing the grant, both teachers and parents highlighted the importance of integrating technology into instruction and the need to provide homework help in after-school programs for students. Fast Forward's goals are to increase technology literacy, improve job skills, and increase both personal self-sufficiency and the sense of community. By Albritton's desk in the center hangs a sign, "What is a neighborhood technology center?" It lays out the spirit of Fast Forward in a few short lines:

Offers you a way to learn about technology

The way you want to learn

When you want to learn

Offers you a way to have access to

Technology without owning a computer

Provides the community with a

Way to improve the lives of its

Citizens through the use of technology

To meet this mission, the Fast Forward community technology center provides a range of programs to preschoolers, middle school students and their parents, and seniors in the community. Most of the programs provide a basic introduction to the use of technology, but some teach more advanced skills, such as Web design and robotics. The center itself occupies the space of a former detention hall within the school. It has its own outside entrance, and the space outside has been landscaped and equipped with picnic tables to make the center more inviting to community members. Consistent with its focus on learning, the center provides not only a set of desktop computers but also hardware that is designed specifically to support learning activities: a set of AlphaSmarts that can be borrowed by students for word processing, LEGO MINDSTORMS sets, and robotics equipment designed to provide engaging ways to teach students programming.

Building on a Rich Tradition of Faith-Based Volunteerism

Fast Forward got started when a group of churches in the Shandon section of Columbia decided that they wanted to do something new and substantive for the community, after years of sponsoring a Thanksgiving Day religious service together for the community. They contacted United Way, and administrators there suggested that schools needed tutors. Around this same time, Dee Albritton of Columbia's Cooperative Ministry and community activist Elaine Delk separately learned about the Department of

Education's Request for Proposals for Community Technology Centers. They each contacted an administrator for community services in the city of Columbia, who suggested they contact each other. The two activists assembled a team of six partners and, within 2 weeks, drafted the proposal that led to Fast Forward.

These and other churches form an important part of Columbia's community, and they have contributed to a rich tradition of faith-based volunteerism from which Fast Forward has benefited. Fast Forward relies heavily on volunteers to staff its programs: 8 regularly scheduled adult volunteers and 15 youth volunteers, plus up to 30 drop-in volunteers. Many of these volunteers come from area churches. The local churches provide child care for parents learning computer skills during weekends. The churches also provide transportation to preschoolers coming in from five different area preschools.

The Hand Middle School is in fact a nexus of services provided by not only church volunteer groups but also community-based organizations and school groups. Fast Forward is funded through the local United Way of the Midlands, which has a deep commitment to preschool education in the city through its Success By 6 early childhood development initiative. Next door to Fast Forward is a Community in School center, funded by the city. The center offers social services, mentoring, and clothing to needy students. There is also an after-school Connections program, funded through the 21st Century Learning Centers program, which provides enriched academic services to middle school students.

The Two Dees of Fast Forward

Just as it is difficult to imagine Fast Forward without its strong network of volunteers, it is difficult to imagine how the center would be successful without the "two Dees"—center director Dee Albritton and her assistant, parent Dee Sanders. Fast Forward's program evaluator, Lynn Bailey, suggests that they are like a pair of professional athletes who perform so well together that they are making a very difficult and complex task look effortless.

Dee Albritton, the director of the community center, is a former teacher who also ran her own consulting business. In her words and deeds, she is the "prime mover" behind Fast Forward. A disciplined, take-charge person, Albritton confesses that she is a compulsive organizer and alphabetizer, often taking Dee Sanders' loose piles of material and shaking them into order. The students call her "Dee 1," and Dee Sanders is "Dee 2."

Albritton is a former entrepreneur in computer training, whose work involved long hours of travel and public speaking. After the birth of her daughter (now a sixth-grader at Hand and a member of the Fast Forward robotics team), Albritton took leave from her business and devoted herself to community organizing and outreach to the homeless in Columbia. Albritton is committed to helping others and, from all appearances, lets very little get in her way: she has the saying "People who say it cannot be done should not interrupt those who are doing it" framed on the windowsill near her desk.

Albritton's chief responsibilities are to coordinate and manage the center, with support from Sanders. The Fast Forward team has a four-person management committee that meets at least monthly, headed up by Albritton. Hand Principal Jeanne Stiglbauer, United Way Vice President for Resource Development, Mike Gray, and social service worker Elaine Delk are also on the committee. In addition, there are quarterly meetings of a 25-member advisory board, composed of representatives of institutions who are partnering with the program, such as United Way and local churches, parents of youth participants, and some participants. There are three subcommittees that meet every six weeks to focus on specific issues: program sustainability, publicity, and technology.

Outside evaluators, Lynn Bailey and two assistants, periodically compile information about program use, the demographics of the participants, and client satisfaction. They have conducted four focus groups with class participants (one youth group and three adult groups) and plan to conduct these periodically. The evaluators report that their feedback is used to make program improvements. They are very impressed with Albritton's willingness to adapt the program to their suggestions.

Although the original grant requested a full-time administrative assistant and full-time outreach coordinator, they found the demand for the center so great that a full-time outreach coordinator was not required. They therefore combined the administrative assistant and outreach coordinator positions into one. A parent volunteer from Hand filled the position temporarily; then, in the fall of 2000, Dee Sanders, another parent, filled the position permanently. From her desk by the door of the center, Sanders fields numerous requests, demands, and questions from all directions with equal care and attention. Sanders is new to the technology field and is taking courses in computer use to broaden her skills in supporting the center's activities and Albritton's leadership.

Teaching and Learning at Fast Forward: Everyone Helps Out

The selection of parents to help staff the Fast Forward community technology center reveals a core belief of the leadership team that is instantiated in many ways throughout the programming: that community members are not to be seen just as recipients of services but rather as active contributors to the life of the center. The expectation, met by Dee Sanders, is that parents and community members will care enough about Fast Forward to make it successful in building children's and adults' basic skill level with technology. The same belief is reflected in the way that teaching and learning opportunities are designed at Fast Forward.

In the summer of 2000, when Fast Forward was just getting started, Dee Albritton recruited nine students, ages 9 to 13, to serve as youth volunteers to staff a summer camp program. The program included a special transition course for elementary school students moving to middle school that used the center's new technology. There were sessions on keyboarding, Internet searching, PowerPoint, and robotics. The youth volunteers were assistant teachers in the program, helping to keep the program on track, even as many of them were making the transition to middle school themselves.

Principal Jeanne Stiglbauer described the transition program as "very powerful." She cited the benefits experienced by a fifth-grader who had been experiencing difficulty in school. He enjoyed participating in the program, and at the end the summer, his

mother came to Fast Forward with tears of joy in her eyes, hugging the staff members, crediting them with "bringing out" her son and building his confidence.

Youth volunteers themselves have learned a lot along the way and gained in self-confidence, according to Albritton. Youth volunteers who participate in the "Helpline Helper," in which center participants can call in questions and get technical assistance from volunteers, have received training in basic troubleshooting to help them do their jobs effectively. Others have grown more confident from having the opportunity to teach what they've learned in class and even to external audiences. One boy, for example, recently presented what he'd learned from studying robotics at the center to the governor. Albritton observed:

> [He] always walked around with his head down, never looked up at anybody, and a week ago he was presenting robotics in front of the governor and shaking hands and big smile on his face and all the confidence in the world.

The way Albritton runs her classes may help explain how these transformations occur. She encourages students to explore new technology tools and allows students to discover the complexities of new technologies without dampening their excitement about them. One day in the 2000-01 winter, Dee put before the students a new LEGO moviemaking kit. There was a round of yelping as the kids jumped up from their spots and raced to a spot on the carpet in the front of the room. At that point, Dee stepped back and let the students take charge. The students started working in a group, some consulting the directions, some just grabbing the LEGO blocks and starting to explore them. After several minutes, students' initial excitement was replaced with a sober realization that the kit was rather complicated, and it would take some time—probably several after-school sessions—before they would be making movies.

During this same session, these same students were able to explain with ease some of the skills they had already mastered with technology in earlier sessions. The students in the after-school program had been working with LEGO MINDSTORMS, a toy kit that allows students to program LEGO creations to perform certain actions or

move along a specified path. The program requires students to master the basics of programming and to understand computer programming as a logical sequence of steps. Showing off her creation in action, one student explained that her robot was a kind of dinosaur that kept following black lines in a kind of serpentine circle. Another had programmed his LEGO creation to perform a special arm-lifting trick.

Inviting students to explore new technologies that allow students to create, program, and design multimedia productions has been motivating for this particular group of students. Their skill in explaining their creations, moreover, is an important gain from participating in Fast Forward's after-school program. It is a short step from explaining to a researcher how one's LEGO MINDSTORMS creation works to helping out other center participants as a helpline volunteer or even designing a Web page for a local business, as some youth volunteers have done. Fast Forward's principle of encouraging everyone to help out, even as they are learning, turns out to be a potentially powerful tool in supporting learning, much in the way peer teaching can support a deeper understanding of content being taught (Wood, Bruner, & Ross, 1976; Brown & Palincsar, 1989).

Making Learning Accessible: Fast Forward's Challenge

Although Fast Forward has made a strong effort to ensure that more than just access is provided at the community technology center, there remain problems related to access. Because the area served by Hand Middle School is so large, the center's mission to serve the entire area is quite ambitious. It is difficult for some of the low-income community members to reach; and teenagers, for whatever reason, do not attend the programs at the middle school in large numbers. Fast Forward administrators have arranged for buses, and they are seeking to offer satellite programs in community centers in poor neighborhoods. Despite these efforts, it is still difficult for many residents from neighborhoods that are farther away to make it to the center.

As the center begins to think about how to sustain itself beyond the life of the grant, another set of issues related to access has emerged. The center is considering

having participants pay a fee for classes after the grant funds are no longer available to pay for staff salaries and extended school hours. The leaders of Fast Forward are considering exactly what that fee should be: all are agreed that it should be lower than the price participants would have to pay at a local community college. As long as the price is lower, more low-income families will be able to afford classes. At the same time, the center will be faced with the challenge of offering classes at a rate that continues to support center activities and staff. As the program continues, Fast Forward will have to take up this challenge to its intent to make the school a "real community," as Dee Albritton puts it, for the people of Columbia.

4. TLC @ the Armory: A New York Institution Opens Its Doors to Technology

When many native New Yorkers hear the name "The Armory," they think of sports. A large complex taking up two city blocks in the Washington Heights neighborhood of Manhattan, the Armory Foundation building was for much of the 20th century the place where high school students from across the city and state came to compete in track and field. The Armory's large indoor track was home to high school track meets from the 1930s through the 1970s. But in the 1980s, when New York City's homeless population grew rapidly, then-Mayor Dinkins decided to convert the city-owned building into an emergency homeless shelter. Gone were the track meets, but in place of the city's youth were housed some of New York's most indigent residents.

Before its conversion to a homeless shelter, there was a perception among some neighborhood residents that the Armory contributed too little to this rapidly changing neighborhood. In the 1960s, the neighborhood consisted largely of Irish, Greek, and Jewish families, whose parents or grandparents had moved to New York in the late 19th and early 20th centuries. Many of those residents moved out in the 1970s and were replaced by immigrants from the Dominican Republic; Spanish replaced English as the primary language spoken in shops and on the streets and sidewalks of the neighborhood. The Armory, meanwhile, remained the center of track and field activity for the city, but few of the newer residents ever went inside the huge building. To community activists, the Armory was valuable real estate held closely by the city and private interests whose mission of serving the city's high schools was not closely aligned with some of the immediate neighborhood's most pressing needs. The building's conversion to a homeless shelter eased some of the strain, but it created other problems: New York City no longer had a central location to hold its track meets.

The Transformation of the Armory

In 1994, the Armory building underwent another transformation. The Armory Foundation was created with the vision of reestablishing the Armory as a site for training New York youth in track and field, while at the same time providing needed social services on-site. Today, the Armory building is the home of a number of nonprofit organizations, most recently, the new Technology Learning Center at the Armory (TLC @ the Armory), funded through the U.S. Department of Education's Community Technology Centers program. Today, neighborhood residents come to the Armory for GED classes, adult basic education classes, youth programs, and social services, and to learn basic technology skills. Some of the community activists who once were most critical of the role of the Armory in the neighborhood now sit on its board.

The TLC @ the Armory is an important part of the success of the transformation of the Armory. Designed to provide technology access to neighborhood residents who otherwise would not have access to computers or the Internet, the TLC @ the Armory provides a welcoming environment for youth who attend local district schools and are learning to write and design Web pages, adults seeking to find jobs or to improve their word processing and resume writing skills, and seniors learning how to use computers for the first time. According to the partners who developed the TLC @ the Armory, more community residents are coming to the Armory than ever before to use the services provided there and are creating a new chapter in this building's and the neighborhood's history.

An Active Partnership of Three Organizations

The TLC @ the Armory is a partnership among the Armory Foundation; the New Heights Neighborhood Center, a community education referral service; and MOUSE (Making Opportunities for Upgrading Schools & Education), a nonprofit organization dedicated to supporting technology integration in schools and community centers. These three organizations have all been active from the beginning in conceptualizing the goals and program offerings at the center and providing parts of the center's programming.

It was enthusiastic staff members at MOUSE who suggested to the Armory Foundation that it apply for federal funds to build a community technology center. MOUSE had been working with New York City schools, providing volunteers to help wire schools and train teachers in the integration of technology. They saw in the community technology centers program an opportunity to work with smaller, nimble organizations like the Armory Foundation to make technology accessible to more young people and community residents. They brought together the Armory Foundation, which had already begun to think about upgrading its dilapidated computer lab, with the New Heights Neighborhood Center, to develop a proposal. At the same time, AltaVista was planning a large East Coast launch of its Web site and planned to give 550 new computers for kids to use in schools and community centers. AltaVista chose MOUSE as the conduit, and the first "matching" funds requirement for the CTC grant was met: some 50 of these computers were earmarked for a new Technology Learning Center at the Armory.

Each of the major organizational partners has had from the beginning a strong commitment to seeing the TLC @ the Armory succeed. "On paper it sounded great," noted Stephanie Penceal, Executive Director of the TLC @ the Armory, who was hired after the grant was awarded. "I was pleasantly surprised to see that, in fact, the partnership was a strong one," she added. The partnership works in part because the organizations mutually benefit from their participation. Until 2000, the New Heights Neighborhood Center was housed a few blocks north of the Armory, in a much smaller space. They could only refer their students to ESL or GED classes that were offered by other community-based organizations. The grant called for New Heights to provide these classes at the new community technology center, in exchange for space in the building, donated by the Armory Foundation. New Heights and the TLC @ the Armory are therefore neighbors on the second floor of the Armory, and both bring in new youth and adult participants to other programs of the Armory. MOUSE, for its part, found a way to leverage a substantial donation from a national business, AltaVista, to help meet its own goal of improving technology access in low-income neighborhoods of New York. MOUSE staff are paid for curriculum development and for the creation of a management information system (MIS) to help track participation in the TLC's programs.

Leadership and Structure of the TLC @ the Armory

The community technology center is run by an experienced technology educator, Stephanie Penceal, who continues to develop and clarify relationships among the partner organizations, as well as draw on her own connections in the educational technology community in New York. She has recently coordinated the development of memoranda of understanding with each of the partners to clarify roles, responsibilities, and financial relationships among the partners. In developing programs, she has called on former colleagues in education to provide programs and sought the counsel of various literacy organizations to help with the design of the Reading Readiness program that MOUSE has agreed to implement. Penceal's studies at Bank Street College of Education and her experience with new media and with designing curricula for informal learning centers make her a likely candidate for a community technology center like the one at the TLC @ the Armory.

Penceal is assisted at the center by Christian Mariano, a native Spanish speaker with a similar background in educational technology to hers. Mariano not only maintains the network that links two computer labs but also teaches a number of classes at the center. He is skilled in all aspects of system administration, and according to a number of participants, is an incredibly patient teacher.

The TLC's space is brightly lit, inviting, and clean. There are two separate labs, the larger containing 19 workstations and the smaller containing 16. All are networked to the Internet with a T1 connection donated by Globix Corporation. One lab includes a reading nook, where young children can sit and read children's books that are part of the TLC's literacy program. New Heights' office space and classroom are just across the hall.

Classes are offered at the center Monday through Friday during the day and evenings. Most of the classes offered during the day focus on basic introductory computer skills and are attended by adults, many of whom are retired. In the early afternoon, youth who participate in other programs at the Armory and in programs at the TLC attend. Open access is provided on Mondays and Fridays from 10:30 a.m. to 5:30

p.m. to anyone who has participated in center programs. During these hours, nearly two-thirds of the workstations are used, and Penceal and Mariano both provide individual assistance and tutoring to participants. This one-on-one attention is much appreciated by a number of participants, who cite the help as one of the key reasons why they keep coming to the center.

Using Technology for the First Time: Seniors at the TLC

The TLC @ the Armory benefits from relationships with existing networks of people in the neighborhood, especially networks of seniors. Ina, a participant and volunteer at the center, heard about the center through a walking program she was part of at the Isabella Geriatric Center. She took part in an early class and enjoyed it so much that she took another class. She brought in more than 10 people from other social groups she's a part of, including some friends. "I've taken every course they've offered," says Ina, "and I've been singing their praises to everybody I meet, friends and strangers alike."

For Ina, the center has become an important part of her social life. Her husband died in January 2000, but she's found a sense of community at the TLC since then through taking classes and becoming a volunteer at the center. She started with Introduction to Computers and then took the workshops on e-mail and the Internet. She's taken a class on PowerPoint, as well, and plans to take classes on Excel and Web design. She says she liked the classes on the Internet and using e-mail best:

> We actually learned what "www" is, about Web pages, Web sites, and how to do a search. In the e-mail class, we actually got e-mail addresses, so we could then use those addresses and send e-mail to friends and receive e-mail responses. But I hope to do more than that. I'm in the process of buying a computer….And I hope to, among other things, surf the Web….I'd like to do genealogy research on the computer.

When she started coming to the TLC @ the Armory, though, Ina was a novice who had very little experience with computers. When she first started out, she was afraid of computers:

> I was afraid I was going to break it if I did the wrong thing, if I pushed the wrong key. But now, I'm feeling somewhat comfortable with it, comfortable enough so that I do come in and coach some of the beginning classes, such as Introduction to Computers, or How to Buy a Computer. I coach the e-mail and the Internet classes.

She helps out in Open Access hours as well. On a day in January 2001, Ina could be found helping a German man look up his hometown (Hamburg) newspaper on the Internet. He was having trouble spelling the newspaper name and was not turning up any results. Ina patiently worked with him until together they found the site, and the man began to read. Helping out in this way, says Ina, "is good because it reinforces what I learn. Each time, I learn new things." When asked what she likes about the TLC, she says "that I can be here, continuing to learn, I can help out, and feel good about myself."

Ina is not alone in her belief that the TLC has made a difference in her life. Rose, another retired senior who takes classes at the center, says that the classes she's taken there have transformed her willingness to stick with learning the complexities of computers, even though she gets frustrated by what she can't do. Other courses in computers she's taken, Rose notes, are too expensive, and there are few opportunities to really learn what's being taught. She says that the supporting materials at the TLC and the patient and effective instruction there have made it a much better experience for her. She still gets frustrated when she can't do something, but she's willing to stick to it because she feels that she's learning.

Arthur, a participant in the MS Word class, has already learned a lot about the Internet that's helped him with his church's prison ministry but that also has helped him think about the (local) societal impact of information and information technology. He's found information about 20 of the prisoners with which his church has been corresponding. And he's discovered some of the potential dangers of information

available on the Internet: before, no one in his church group knew anything about the individual records of prisoners. But on the Web, this information is publicly available. Arthur is unsure of whether this is a good thing, since their ministry is focused exclusively on reaching out to prisoners, regardless of the prisoners' past histories. Still, he is excited about his newfound skills and the possibility of applying what he has learned to service at his church.

Across the board, adult participants at the center all cited the benefits of the center and felt it was a personally important place for them in their lives. They cited technology access as an important opportunity for them, not only to advance in their job skills but also to help them communicate with others and participate in the life of their communities. In an increasingly digital age, participants saw the community technology center as their connection to the new worlds of media and communication.

Young Children at the TLC: Learning to Write Book Reviews

Executive Director Stephanie Penceal is most proud of a program the TLC offers to young children who are just learning how to read and write. The Spaghetti Book Club is an early literacy project that targets primarily first-graders who are just learning to read and write. The project lasts eight sessions over 4 weeks, and in it students read and review a children's book that is published online. Each session includes a group "read aloud," a mini-lesson that addresses one of four different aspects of a book review. Students also have time to practice writing their book reviews and have them read and critiqued by peers. Ongoing revision and public review are integral to the cycle of learning. When complete, students submit their reviews with an illustration they've scanned in to be published on the Spaghetti Book Club Web site (http://www.spaghettibookclub.org).

The project is an initiative developed by Julie Rosemarin, a Bank Street College graduate and former colleague of TLC Executive Director Stephanie Penceal. Rosemarin originally designed the project as a classroom teacher who wanted to get students excited about writing about literature. She found that the project was extremely

successful in her own class, and after working for a couple of years in a commercial education company, she decided to try to scale up her program and formalize the curriculum.

Originally, having students publish their reviews was an afterthought for Rosemarin, even though she was someone who used technology frequently in the classroom. But it proved to be an important part of the program and a significant motivator for student participation. "It helps them focus on their audience," says Rosemarin. "Their piece is published in cyberspace" for all to see, and not just in their classrooms.

The curriculum presents students with contrasting cases of more and less effective reviews, and introduces students to the genre of review writing. What is unusual about the project is that students really engage excitedly in the process of writing and revision. Even in the after-school hours, nearly all the participants observed were actively engaged in revising and improving reviews they'd already begun. The project takes students through a single book and, through iteration, students develop a more coherent and polished review.

The examples from students who've participated in the program at the TLC @ the Armory illustrate the power of the program. The reviews of students are coherent and show the students' understanding of the plot of the stories. Their opinions and recommendations show an attention to audience and an ability to reflect on meaningful texts. Their illustrations show their skill in linking visual and print modes of literacy, while at the same time providing the students with an opportunity to express themselves creatively. (See, e.g., http://www.spaghettibookclub.org/review.php3?review_id=355.)

Part of the success of the Spaghetti Book Club owes to how much it draws from what we know about how young children learn how to read and write. In this early literacy program, students get to pick their own children's book to review. The students' book reviews call for them not just to summarize their book as in a book report but also to provide their own opinion of the book and make recommendations to others about the book. The facilitator or teacher provides assistance both with phonemic awareness and

with textual understanding, focusing on all aspects of learning how to read and write. Students create their own illustrations to accompany reviews, as well as a self-portrait that is published on the Web. At different stages during the review process, students review each other's work and provide suggestions for improvement. Each of these strategies—peer review, connecting to personal experience, and studying a book of one's own choosing—is important in a learner-centered approach.

Challenges and Next Steps for the TLC @ the Armory

With all its success in attracting youth and adults from the neighborhood to the Armory to learn how to use technology or to use technology to improve academic, language, and job skills, the TLC is not without its challenges. A key challenge for the center has been to find meaningful content for its ESL programs. Even though Penceal has searched for information on the Internet and consulted with others in the educational technology community, she has found little in the way of technology resources to help the many native Spanish speakers who might attend ESL classes at the TLC to learn English. Her difficulty in finding relevant content and tools parallels what the Children's Partnership (Lazarus & Mora, 2000) found in its study of content on the Web: that there is little content useful for underserved Americans, especially English Language Learners.

Another concern within the partnership pertains to funding. The vast majority of funding for the center comes from the CTC grant. The initial capital expenditures for computers and for creating the local area network were drastically reduced by donations from two companies, AltaVista and Globix. Most of the in-kind donations have come from the partner organizations themselves, especially the Armory and MOUSE. Both these organizations waived indirect costs to help overcome a difference between expected and actual costs of renovating space for the lab and for New Heights Neighborhood Center. In addition, the local councilman's office contributed funding for the center in the first year. Where funding might come from to upgrade aging equipment or meet indirect costs when federal funding ends is uncertain. Who will provide ESL and GED classes, if New Heights funding ends and new funding is not found, is similarly unknown.

For now, Executive Director Stephanie Penceal is optimistic about the center's funding in the last year of the grant. The center has attracted attention from corporations, foundations, local and national media, and local politicians and community residents. In recent months, for example, Verizon and Sun Microsystems have made contributions to the center. At present, the center is expected to meet its matching requirement for Years 2 and 3. Moreover, the partners continue to make significant contributions to the center. In addition to covering the cost of GED/ESL instruction, the New Heights Neighborhood Center is covering the cost of certified curriculum implementation for MS Office and for TLC staff to be trained and certified. It is also covering the cost for a certain number of students to take certification exams, totaling nearly $30,000. New Heights is also donating $20,000 to the TLC and the Armory for more direct services and for the Armory to complete renovation of New Heights offices.

At the same time, funding beyond the life of the grant is by no means guaranteed. Penceal is concerned that the Armory's selection as the site for a new Track and Field Hall of Fame will take away resources that otherwise might go to the TLC, at a time when sustainability is an important concern of stakeholders in the TLC. The New Heights Neighborhood Center's federal funding is also expected to end in the next year, putting potentially more stress on the partnership that makes up the TLC. Still, Penceal notes that the Armory Foundation has a strong development staff person who is committed to helping the TLC raise funds and is part of the planning team thinking about long-term sustainability. In 2001, the TLC @ the Armory will spend much time and effort to ensure that the services it now provides to this neighborhood can be sustained, so that others might benefit from the technology access and educational services the center now provides.

5. Inside the EBNL Collaborative: New Models of Achievement and Community

When Michael graduated from the Street Tech Academy in December 2000 after nine rigorous months of classes, he did not know what to expect. He and his fellow classmates were part of a pilot program, the first to sign up and go through the 20-hour-a-week course that trained them in, among other things, the basics of network management. As a group, the students reflected the ethnic diversity of the region: African Americans, Latinos, Mien, and other South East Asian refugees. They also represented the economic realities of the region. Michael had been chronically underemployed, moving from one temporary job to another and earning just above minimum wage. His fellow students had been similarly underemployed or unemployed. Several of them had been juvenile or adult offenders. Still, despite his past difficulties, a week or so after graduation, Michael came to the orientation meeting for the next class to share his good news: that very day he had received an offer for a $43,000-a-year job from a local high-tech company.

Michael's fellow graduates have found similar success. Of the 18 students in the group, 15 are working in full-time positions that average salaries of $18/hour. One of the remaining three students is taking classes at a community college, and another continued with her existing job for personal reasons. Only one graduate out of the 18 has failed to stay involved with the program and meet the expectations of its graduates.

The kind of change in economic status experienced by Street Tech's graduates is dramatic for residents of western Contra Costa County and Alameda County in the San Francisco Bay Area. In a geographic region where Internet millionaires are commonplace, half the people in many communities live well below the poverty level. In the city of Richmond, near Street Tech's San Pablo facility, high percentages of teen births, low test scores, and low rates of high school completion are the norm. In West Oakland, home to Street Tech's partner center Urban Voice, thousands of manufacturing, military, and direct and indirect civilian jobs have been lost in recent years. Despite the strong need, both regionally and nationally, for suitably trained technicians and

information technology professionals, few in these communities find themselves able to capitalize on such opportunities.

The changes Michael and his Street Tech cohort have experienced in their lives are the direct product of a distinctive partnership among several community technology centers and support organizations in the Bay Area: East Bay Neighborhood Links. The EBNL collaborative includes five technology centers, which among them serve children in after-school programs (Coronado and M. Robinson Baker YMCAs), young adults in high-quality professional training programs (Street Tech and Urban Voice), and community members at large through an on-site open access and basic education program (Crescent Park Multi-Cultural Family Resource Center). The YMCA of the East Bay serves as lead agency for the collaborative, which also includes UC Links, a network of university-school-community partnerships providing guided technology-based activities in after-school settings, and WestEd, an outside evaluator focused on strengthening programs to better meet their objectives. PowerUP has, since the founding of the collaboration, committed to installing additional computers in three of the EBNL centers. Other organizations—such as CompuTrain and LEAP, a local literacy program—have partnered with individual EBNL centers to improve programming.

For all the EBNL technology centers, the EBNL collaborative was the right thing at the right time. Funding from the Department of Education's Community Technology Centers program allowed Street Tech to launch its center, Urban Voice to begin job training, the after-school programs to acquire equipment and hire staff, and EBNL overall to begin access-focused programming at four of the five sites. The collaborative was able to hire a full-time director in December 1999, who immediately began coordinating funding and other efforts across all five centers. Since that time, each center, as well as the collaborative as a whole, has enjoyed successes and faced challenges, and each offers a distinct perspective on the role and mission of community technology centers serving metropolitan areas. The job training and after-school programs offer especially interesting insights into how CTCs serve their local communities.

Fundamental Commitments: Street Tech and Urban Voice

Effecting fundamental change in people's lives is an immense undertaking, yet the directors of Street Tech and Urban Voice have deliberately taken on this challenge. Paul Lamb, Street Tech's founder and co-director, and Boku Kodama, technology training pioneer and executive director of Urban Voice, are kindred spirits who bring sophistication and passion to their work. Both have been successful at running businesses and nonprofits, both know the world of inner-city violence and crime, and both are fundamentally committed to transforming the lives of the people they serve. The concept they developed for their programs is simple: to direct network training at the "non-traditional work force." The means to this end seems simple, too: to provide an intensive job-skills program (e.g., leading to A+, MOUS, I-Net+, Network+, MCSE, or MSCS certification) linked with explicit and embedded instruction in life skills. In practice, of course, the approach requires a great deal more.

Van Souk Lianemany is one of the advisors who helped Paul Lamb and his partner, Doug Stein, plan Street Tech in its early conceptual phases. Lianemany is now a QA manager with the Learning Company and often helps with Street Tech work, advising the directors, giving guest lectures, and doing "little things" like staying up all night to make fliers for programs and events. He is an unofficial member of the Street Tech staff. When he and Lamb first met, he was a gang member in a great deal of trouble. Lianemany describes an essential quality that people like Lamb and Kodama need to display if programs such as theirs are to work:

> When I was in juvenile hall, my momma didn't visit me. Paul [Lamb] and [his colleague] Warrick, they visited me. And I said, "There's no need for them to do all this stuff," but they never turned their back on me. Now I'm giving back what they gave me.

Lianemany attributes his life turnaround to the personal commitment he felt from people like Lamb.

If the center staff give deeply of themselves to the participants in Street Tech and Urban Voice, they expect deep commitment from the participating students in return. Each of the young adults interested in taking classes at these centers goes through an intensive screening process that can include interviews, written essays, and pencil-and-paper testing. Students are expected to be at class, on time, for four or five sessions each week, typically totaling 20 hours per week. During the first orientation meeting for a new group of Street Tech participants, two young people who had previously been accepted into the program were turned away and told to resubmit their applications later because they were 7 minutes late to a 3-hour class. Street Tech has a dress code requirement (business casual), which was instituted to habituate students to presenting themselves appropriately in professional settings. Students coming to class in jeans or mini-skirts are not allowed to attend that session.

Whether the approach is strict or more flexible, as is the case at Urban Voice, both centers seek to instill new sets of values in students. Central among these values are those pertaining to adjusting to new situations. Both Street Tech and Urban Voice try to bring this point home in, literally, a visceral way. By offering cooking classes, they not only teach participants to eat more healthily and to save money on food, they also challenge participants' long-standing habits of body, as well as mind. Urban Voice's Boku Kodama takes a broad, multisensory, and aesthetic approach to expanding students' sense of possibility. In December, he and his life-skills instructor, Carmen Reyes-Edstrom, took 14 students from their morning and evening classes to see the Nutcracker ballet.

An artist herself, Reyes-Edstrom takes an aesthetic approach to challenging students' habitual notions and behaviors in Urban Voice's life-skills classes. During a session built around Michael Gelb's How to Think Like Leonardo Da Vinci, Reyes-Edstrom took the students on an observational tour of the old and ornate Victorian building Urban Voice shares with a number of West Oakland's other important community-based organizations. Reyes-Edstrom linked students' experiences with the kinds of efforts they will have to make to adapt to new jobs and new life roles. In

conclusion, she emphasized the responsibility each student must take in assimilating the new:

> Let's say you're going to work in a bank, you're going to work on some computers, and you're so sure that the system's going to be a certain way. And you get there and you go, "Oh my God! This is not at all what I expected!" What are going to do, cry? Stand firm and say, "Well this is not what I expected"? No, you're going to adjust. You're going to find out how you can salvage that problem, you're going to ask the right questions.

As learning environments, the most fundamental and distinctive feature of Street Tech and Urban Voice is the responsibility students take for one another's successes and failures. At Street Tech, the essential maxim is "The more you know, the more you owe." At Urban Voice, signs around the computer room list variants of its essential maxim: "Each one teach one." Lamb, Kodama, and the other staff at each center exemplify this ideal in a number of ways, each showing that knowledge can and should be about service to others. Peer-to-peer learning, collaboration, and a spirit of cooperation with fellow students are new experiences for many of the participants. Asked what makes centers like Urban Voice and Street Tech different from school, the most frequent response from participants was, "the teamwork." Lianemany, the advisor to Street Tech, expressed it in broader sociocultural terms:

> The great thing is that [at these centers] you see a lot of cultures combined helping each other out. You got the blacks, Asians, Mexicans studying with each other, working with each other. You barely see that, you know. Each race usually sticks with its own….Where I grew up, it was all about dedication to friends, dedication to friends and to themselves. That's how all these little gangs got started, through dedication to friends and themselves. If we could establish that they dedicated themselves to something useful, something good, then later on, after they get their first job and learn, they'll come back and say, "I didn't get

> all this for free; somebody gave me a helping hand, so now it's time for me to give back."

Giving back is an institutionalized aspect of giving to others at Street Tech and Urban Voice. Within just a few months of completing the program, graduates are expected to contribute a specified number of hours of service, for each hour they spend in training themselves, helping the center and subsequent generations of students. This system is about more than reciprocity, and even about more than sustainability for each of the centers. Giving back is about transformation of one's identity. The programs at Street Tech and Urban Voice work powerfully on such transformations, which are multifold. First, students are transformed from technology "outsiders" to technology "insiders." Again and again, participants said that new opportunities and greater earning potential were important to them, but even more important were issues of "not being left out" of the digital revolution, indicating their resistance to being marginalized along yet another dimension in American society. Second, students are transformed from "have-nots" to "haves." As more and more graduates get well-paying jobs, they experience new roles based on their economic status. Third, and perhaps most importantly, students are transformed from being recipients to being people in the position to give.

Van Souk Lianemany exemplifies this final form of transformation. He explained that of the 30 or so gang members he grew up with, 3 people were able to escape the cycle of violence and poverty they were living in. Now that they have made successes of their lives, Lianemany went on, "It's time to give back." He and his friends examine themselves in relation to others who are stuck in difficult lives:

> Let's give these people what wasn't given to us. All the stuff we've done was through our own hard work. But these other people, they might not be as strong as we were. So we've just gotta give them a helping hand.

Street Tech and Urban Voice are building on passions like these to create a new kind of learning and, as well, a new kind of community in each of their centers.

Laying the Foundation: After-School Programs at Coronado and M. Robinson Baker

At the Coronado and M. Robinson Baker YMCAs, the next generation is getting a hand up. Each of the after-school programs at these YMCAs has added a computer activity component for participating children, in conjunction with UC Links. UC Links adapts the 5th Dimension after-school club model, developed in the late 1980s at UC San Diego by Michael Cole and his colleagues (Nicolopoulou & Cole, 1993). This model uses discrete educational software (mostly CD-ROMs like those in the Math Blaster and Reader Rabbit series), as the basis for learning activities in which students interact with peers, university undergraduates, and other adults in a partnership that brings academic research and undergraduate service efforts to the after-school site.

The predominantly African-American neighborhoods served by the Coronado and M. Robinson Baker after-school centers are characterized by rows of flat-roofed bungalows on treeless, busy streets with arguably too few stop lights and too many liquor stores. For children who otherwise would go unsupervised in the after-school hours, the YMCAs provide safe and supportive environments for exploring a number of activities. Jessica Payne, CTC and After-School Program Director for the M. Robinson Baker YMCA grew up in the local neighborhood. She returned here after recently finishing an undergraduate degree at UC Berkeley. During her time at Berkeley, she worked with the UC Links program, learning about life in underserved communities from a different perspective than the one she knew growing up.

Payne had to set up the M. Robinson Baker computer lab with nothing but a bare room to start. After getting the computers and basic software in place, she created the "task cards" for the software. In the UC Links model, task cards act as an additional scaffold to guide students to successful completion of the CD-ROM games, and are a basic component of the program. Once this was accomplished, Payne began to localize the program somewhat, changing the names of its elements from English to Portuguese,

for example, to fit with the Capoeira (a Brazilian art form combining dance, martial arts, music, and rituals) program being run in the recreation room at the center. She also added geographic components to the UC Links program, naming each computer after a country, each set of software programs after a planet, etc. Payne's intent was to give a broader perspective to the students at the center, who have little experience outside their own neighborhood.

By and large, for both Payne and her counterpart, Megan Micco, at the Coronado facility, replicating and sustaining the UC Links model is fairly straightforward. Less straightforward for them is finding time to develop additional programming or to implement new ideas. Nonetheless, Payne has taken the initiative to purchase desktop publishing and other graphics software to expand the kinds of activities that kids engage in at the center. She involved the children in the production of a digital history of the center for presentation in an exchange with students from Brazil (arranged through the main offices of the UC Links program, which is directed by Charles Underwood).

The average-sized room and relatively small number of children using the community technology center facility in the M. Robinson Baker after-school program contrasts notably with the situation at the Coronado site. At Coronado, everything about the facility—from the lobby to the staff office space to the gymnasium—is spacious and accommodating, except the area that functions as the community technology center. When the CTC was being planned, the only unused space in the building was an old utility closet: this became the Coronado community technology center. The neat, white-washed walls and mounted instructional posters (e.g., "Parts of a Computer") give the room a clean but sterile feel. There is little to engage the students in this space other than the computers. (By contrast, in the large room just outside, kids play board and table games in noisy, chatting groups. A trio of boys standing under a teenager's careful charcoal drawings of Thurgood Marshall and Michael Johnson swear and laugh out loud, good-naturedly apologizing when they take note that the researchers have heard them.)

Despite all the distractions outside and detractions inside the room, the community technology center is the most popular place in the Coronado YMCA. Because the CTC has only eight computers squeezed into a minimal space, the children

submit themselves to an unforgiving signup and rotation schedule to gain access. The children do so gladly for a chance to work through Arthur's Teacher Trouble, to see whether they can make it on the Oregon Trail II, or to compose an original letter to the "Spider." (The role of the Spider, a mysterious electronic wizard who answers children's written questions, is usually filled by the center director Megan or any of the UC Links undergraduates who have a free moment to respond.) One participant wrote the following message for the Spider just before her school's winter break:

> Dear Spider,
>
> How are you fine I hope. my name is Shakita I'm ten years old how old are you? Do you like drawing or writing I like drawing and writing they are very interesting to me have you ever met Kitty she's my favorite step cousin sometimes she can get on my last nerves but she's really nice to me her favorite think to do is talk she love talking that her favorite thing to do. How old are you I Already told you my age What grade are you in ? I'm in the 5th grade well I got to go now see you later bye
>
> See you soon hope I here from you Shakita

The enthusiasm for communication and literacy that Shakita shows in this letter reflects a general positive attitude toward the academic skills students learn and practice in the after-school programs. The WestEd evaluator working with EBNL, Jerome Hipps, completed a report on the after-school component of EBNL after 1 year of program funding (Hipps, 2000). On the basis of interviews with teachers, parents, and students, WestEd concluded that all three groups were pleased with the effect of the program. Participating children showed that "they recognized the similarities between problems they worked out on the computer and those that they had in class or on tests" (Hipps, 2000, p. 10). They also had a great deal of fun while they learned, Hipps noted.

As programs aimed at providing academic support, basic computer skills , and some open access, the after-school programs at the Coronado and M. Robinson Baker

YMCAs are meeting their objectives. The children participating in these programs have already crossed some of the most difficult terrain leading to technological competence and self-efficacy.

Challenges

Although the EBNL centers all face long-term funding challenges that they are working to meet in a variety of ways, the centers' short-term successes depend on the interrelated issues of staffing and curricula. Directors at Street Tech, Urban Voice, and both YMCA sites spoke about difficulties finding enough time to prepare and develop materials for programs. Staffing problems are particularly acute for Street Tech and Urban Voice. Instructors who are technologically well trained enough to teach the courses are also well trained enough to earn a substantial income elsewhere. Very few technologically knowledgeable instructors interested in conducting training have sufficient pedagogical skills and understanding to teach well. Even fewer have experience working with young adults who have been living in underserved communities.

Both of EBNL's job training programs lost trainers during their first sessions because, as Christine Karim, EBNL Director, explained, the instructors underestimated the amount of time it would take for them to develop and adapt curricula. In a short amount of time, they became overwhelmed.

Glenn Price, who oversees the collaborative for the YMCA of the East Bay, likens technology trainers to classroom teachers, clergy-persons, and others whose life work is "a calling." They do what they do out of conviction. This may be the only way to describe someone like Duke Le. Le, who considers himself fortunate to have found his way into an entry-level technician's job a few years ago, has steadily worked his way into a $104,000-a-year position with a corporation in San Francisco. Four nights a week, immediately after work, Lee fights traffic for an hour across the Bay Bridge and into downtown San Pablo to teach the Street Tech course. Three hours and dozens of technical questions later, he is finished with his intensely paced 13-hour workday.

Although corporate time-sharing models and mentoring programs—including the ones implemented by Street Tech and Urban Voice— eventually might produce a cadre of qualified people to staff technology training programs, in the meantime, finding suitable trainers seems to be almost a matter of luck.

Paul Lamb, Boku Kodama, and others in the EBNL collaborative emphasize that a sound curriculum could sustain technology-training programs beyond the longevity of individual instructors. In a fundamental way, appropriate, accessible, adaptable curricula could work to sustain technology-training efforts anywhere in the United States or elsewhere. Even though they are members of community technology center networks and exchange ideas with colleagues in the field, EBNL leaders have yet to locate the kind of curricula they think could make the difference in staffing technology training centers. Any efforts to scale up their programs, which Lamb, Kodama, and others running similar centers see as essential in retooling the American workforce, will depend on the existence of suitable curricula.

In time, "calling," personal sacrifice, and abiding commitment may not be necessary for all, or even many, of the instructors at centers like Street Tech and Urban Voice. Yet, in the current state of the community technology center movement, where all territory is uncharted and every practitioner is a pioneer, dedication to helping others is one focus everyone shares.

6. Blackfoot District 55's Family Technology Centers: Serving Communities in Rural America

The two community technology centers operated by Blackfoot District 55 are located in Bingham County, in the southeastern section of Idaho. The broad valleys and tall mountains of the county are home to potato farmers and owners of large potato-processing plants in the largest potato-growing region in the world, low-wage farm workers and plant line staff of white and Hispanic origin making a living in small towns, and Shoshone-Bannock Native Americans seeking to preserve their culture on the vast L-shaped Fort Hall Reservation that cuts across the county. This is a county where residents are constantly coming to terms with different cultural life ways and the uncertainties of farming, and living in tight-knit communities where families come first.

The town of Blackfoot and the Fort Hall Reservation are a study in contrasts. The town is home to the world's largest potato-processing plants and more than 10,000 residents, many of whom work in agriculture or agricultural services. A few commute to jobs in Pocatello, some 20 miles to the south. The population is mostly white, but there is a growing population of migrant Hispanic farmworkers. Increasingly, these farmworkers are settling permanently in Idaho and becoming U.S. citizens, according to Lew Rodriguez of the Migrant Council. Through the winter and spring, when they are not planting, maintaining fields, or harvesting, they take jobs in the potato-processing plants, which operate year-round. The children of these immigrants attend Blackfoot's public schools, which are becoming increasingly diverse as the town's demographic composition changes. New social networks and activities, centered about family and religious events, such as first communion, and sports have emerged as new forms of social life in Blackfoot.

Just 10 miles south, the Shoshone-Bannock peoples, who have lived in the area of the Fort Hall Reservation for hundreds of years, are confronted less with the challenge of adapting to newcomers than with the task of preserving their cultural identity and autonomy. There are few Native Americans working in the potato fields or processing

plants of Bingham County; the tribe leases out its land to farm owners and agribusinesses. Some 80% of residents of the reservation are unemployed; most of the tribal members with jobs hold tribal social service positions operated by the Bureau of Indian Affairs and the Shoshone-Bannock Nation. These are esteemed positions in the community, because they embody the traditional value of contributing to one's community out of gratitude for what one's elders and parents have given before. The Shoshone-Bannock at Fort Hall are perhaps most proud of their annual pow-wow, held each August and featuring dancers from Native American nations across the southwest. Rodeo and basketball are popular sports on the reservation, and are seen as points of connection with the world beyond the reservation's boundaries.

Staffing to Reflect Community Differences

The Family Technology Centers funded through Blackfoot School District 55's Community Technology Centers grant share a common mission to enhance technology access to the communities of Blackfoot and Fort Hall, and their decisions for staffing were made to ensure that the centers enjoyed high levels of support from these different communities. Both center directors are certified teachers, a decision made when writing the grant to ensure high-quality instruction. And although both directors have been certified in technology, according to Idaho's new technology proficiency standards for teachers, their strengths are more in an understanding of teaching and learning than in technology per se. Their particular skills and backgrounds, in some respects quite different from one another, nonetheless make them well suited to serve their communities.

Ryan Wilson is a former teacher at Stalker Elementary School in Blackfoot, where one of the Family Technology Centers is housed. He will become principal at the elementary school in Fort Hall in the fall of 2001. His skill in building bridges between school and community are well recognized and no doubt contributed to his being selected for the principal's job on the reservation. He was the district ESL Coordinator and speaks fluent Spanish, and is therefore able to communicate with the Hispanic students and older adult participants in their native language. All his adult students at the Family

Technology Center at Stalker describe him as extremely patient, and his way of answering questions on a recent evening while teaching seniors about digital cameras demonstrated a willingness to build on student interest and address student concerns, wherever they might take the class.

Two Hispanic VISTA volunteers assist Wilson in his role as FTC director at Blackfoot. They are both VISTA volunteers funded through the Americorps program, which pays them a fixed stipend of $660 a month. They provide individualized attention to the school-age children and youth and the adults who attend programs at the center, as well as translation for native Spanish speakers when they are a small minority in a class. Once these two volunteers have completed their year of service at the end of April 2001, they will be given the option of receiving $1,200 in cash for completing their year of service or $4,700 tuition credit.

Brenda Honena, director of the Fort Hall Family Technology Center, is one of two certified teachers at the elementary school in Fort Hall who are tribal members. She comes from a family of educators: both her mother and sister teach at the tribally run high school on the reservation. Her sister is known in the community for her technology skill: she has been part of an effort to preserve the Shoshone language through a storytelling project that brings together elders in the community with young children learning multimedia design skills. Honena is also the daughter of a tribal elder. At the opening of the community technology center, her father offered a traditional blessing for the center, an important act in providing community validation for its presence and mission.

Honena is deeply committed to high expectations for her students. She encourages children on the reservation to think about their futures and to plan for college. At the center, she treats the children much as an aunt might: she knows something of the life of each child, the children's parents, and how they get to and from the center each day. She knows brothers and sisters, and can guess where they might be reached if they don't show up to pick up a younger sibling. She helps with specific assignments and monitors each student's computer use in the small room where the center is housed. Honena admits that she doesn't always know how to fix the computers when they break

down, but she has gotten skilled at solving basic problems and calling in the district's technicians when she needs them.

A Focus on Extending the School Day

One challenge that Blackfoot and Fort Hall have in common is literacy development. Reading scores at both Stalker Elementary and Fort Hall Elementary are below national norms, and high levels of poverty among students' families make it more challenging for teachers to help meet students' basic needs while holding high expectations for achievement. Both schools receive federal financial aid from both Title I and Title XII block grants to support programming, but the community technology centers have allowed the schools to extend learning beyond the school day in ways that were not imagined before the grant.

In both communities, there are few after-school alternatives for elementary-age students. Many students come from families where two parents work; they may go to day care after school or be picked up by a family member who is on a constantly changing shift in a potato-processing plant. Recently, youth activists in Blackfoot were successful in helping to build a skate park, but the park cannot be used during the snowy Idaho winters. Many students in Fort Hall stay outside after school, even in the winter, not engaged in any organized social activity at all. The after-school programs at both Family Technology Centers provide a safe, academically focused alternative for youth in both communities.

When they come to the center, elementary-age children are most likely to use Lightspan's Achieve Now software. This program includes CD-ROMs and Internet-based activities to help students practice reading, math, and science skills in grades K-6. Through animated games, the students can work on basic skills selected by their teachers as their areas of greatest need. Students can also check out Sony PlayStations and cartridges with the same activities for use with their parents at home. On a given afternoon, both centers may be filled after the last bell rings with students working individually at workstations, each on different academic games that comprise the

program. To participate, children must simply submit permission slips from their parent and/or teacher to use the center.

Both Ryan Wilson and Brenda Honena, as well as the two VISTA volunteers at Stalker, have been trained in the use of this software to supplement instruction. In addition, teachers in the lower grades at Stalker have all received training in its use and are encouraged to sign up for slots during the school day to bring their classes in to use the Lightspan software, which is popular with students and teachers alike. Sandra Rainey, a first-grade teacher at Fort Hall Elementary states, "The program gives me flexibility in the areas of classroom management and instruction, and helps to meet the individual academic needs of the students. Not only do the children enjoy the programs, but I do too!"

Despite the strong buy-in from teachers and students, the centers' strong focus on providing activities at school-based technology centers has posed some challenges along the way. The Stalker Family Technology Center's night-time programs for adults in basic software use (e.g., word processing, spreadsheets) are filled to capacity. The easy accessibility of these popular courses owes to a decision made in the early phases of the grant to locate the center near the school's entrance, to ensure that community members did not get lost trying to find the center in the school. Before it was the Family Technology Center, however, this room was the school's only teacher's lounge. It took negotiation and advocacy from the overall project director, Dr. Betsy Goeltz, and the support of the principal to push through the decision to locate the center near the entrance.

In Fort Hall, the center is not near the entrance to the school, which is surrounded by a fence. There is a side entrance, but the fence may be a reminder for some that Fort Hall Elementary School is one of the few properties on the reservation not under tribal governance. The school is run by the Blackfoot school district, and students and families must abide by public school rules and customs, rather than tribal traditions. In the past, this fact has been a source of friction between the district and the Shoshone-Bannock tribe, because the tribe does not have autonomy within the school setting. Students must abide by school rules, which often conflict with Native culture. For example, many

students come to school late—as both tribal members and Anglos put it, on "Indian time." The school is required by law to send home tardy slips, and parents have little say over these laws or the consequences for their children. Because of its location in the school, the technology center at Fort Hall remains something of a place apart from the main community life of the tribe.

Partnerships That Ensure Strong Community Support

Many community organizations from different sectors are involved in the Family Technology Center project, both advising project co-directors Betsy Goeltz and Mark Kartchner on programming and providing referrals and links to and from community services. Representatives from the school district's technology and vocational offices, employment and job training centers, local businesses, advocacy groups for migrant farmworkers, and the Shoshone-Bannock tribal council all gave input to a needs assessment, which was initiated by Goeltz to explore the need for a community technology center.

Together, these different stakeholder groups identified literacy, job training and placement, and basic technical training as the greatest needs in the community. Since the centers began operation in 2000, these stakeholders have remained involved in helping to set direction for programming, suggesting modifications to meet the needs of a particular segment of the community better or to reflect more accurately the technical skills required by employers. Sonia Martinez at Job Service, an agency contracted by the state to administer Idaho's strict welfare-to-work program, regularly sends adults looking for work to the Family Technology Center, especially if she discovers that they have limited keyboarding skills or lack basic computer proficiency. Because she discovered that a number of adults coming to Job Service were slow typers, she recommended that the Family Technology Center at Stalker install typing tutor software for these adults to improve their skills.

One project undertaken by the Family Technology Center at Stalker illustrates the potential of such strong community partnerships for garnering support from influential

sectors in a community. Center director Ryan Wilson led a workshop for local farmers on the use of Global Positioning Systems (GPS) and satellite imagery for monitoring crops. The farmers learned to use specialized software to learn about soils, canopy cover, and the signatures of disease and the impact of insects embedded in digital images of the land. A group of 15 potato growers from the area participated in the workshop, sponsored by Jim Percy of Conquest Insurance in Blackfoot. Percy sponsored the project for his farm-owning clients in the area to make up for gaps in access to state-of-the-art technology that farmers in other regions already use to improve crop yields and test the results of different approaches to crop management.

Relationships with such involved and committed partners as Jim Percy and Sonia Martinez were actively cultivated by Betsy Goeltz and Mark Kartchner, the two people responsible for writing the grant and the visionary leaders of the Family Technology Centers. Goeltz directs not only the community technology centers project but also a federally funded Technology Innovation Challenge Grant program for the state of Idaho and two Technology Literacy Challenge Fund projects. She has an extensive background in educational technology and has been working with the Blackfoot School District for 11 years. Mark Kartchner is not only the co-director of the FTC project but also the principal of the Independence Alternative High School, a small school with 120 students. He has played a significant role as a champion of building and bringing community partners to sit on the board of the Family Technology Centers, including Brett Nelson, the Professional Technical Training Director (vocational education); Jeff Mosbrucker, the Community Police Youth Coordinator; and Lew Rodriguez, an advocate for farmworkers representing the Migrant Council.

Both Goeltz and Kartchner spend time with each of these partners, both on-site at their workplaces and at board meetings, where they review programming decisions and set direction together for the center. They accompanied SRI's case study researchers to all of our interviews with program partners and used the opportunity to learn more about how partners perceived programs and to gather ideas about how to improve the programs. They also meet regularly with their program evaluation team, which includes Ruthmary Cradler from San Mateo, California. Cradler travels to Blackfoot frequently as the

evaluator on the Challenge Grants and the Family Technology Centers grant. She has helped to build the district's and programs' capacity as a data-driven organization. The district has been recognized for its exemplary efforts in assessment and evaluation for its work on the federal Challenge Grants. Goeltz and Cradler have helped to transfer what they have learned from the Challenge Grants to the new community technology centers grant. For example, at meetings of the Family Technology Centers board, the group has discussed the results of needs assessments, surveys of program participants, and records of attendance as part of their program planning.

Challenge: Drawing on Cultural Heritages to Improve Access and Learning

Despite the careful attention paid to ensuring a diverse representation on the Family Technology Centers board and matching staff at the centers to the needs of the communities they serve, Blackfoot's District 55 community technology centers face a problem that many centers serving low-income Americans often encounter in developing technology programs: finding curriculum and content that are accessible and useful to participants (Lazarus & Mora, 2000). For example, the center at Fort Hall relies mostly on off-the-shelf software packages to teach language and literacy skills; there also are few opportunities for Native American children at the center to learn literacy skills in both English and the Shoshone language through storytelling projects with elders, as older students in the high school do. Students there do not have access to multimedia design tools, even though the teachers suggest that their learners are primarily visual and have a keen interest in design.

In Blackfoot, many of the native Spanish-speaking population's existing social networks have not been tapped to encourage participation in the center's activities. The church and weekly soccer league are important social groups in the community, and activities such as first communions and Quenceneras (a rite of passage for girls) celebrations are occasions for large groups of families to gather together. These activities compete with center teaching activities for community members' attention and time, despite the opportunity to learn in one's native language how to use technology.

Other access barriers are also significant. In Fort Hall, no transportation is available to take children home after school. They must walk home or be picked up by parents. In both Blackfoot and Fort Hall, it is difficult to attract teenagers to the Family Technology Center; other after-school activities like basketball, work, or just hanging out compete for their attention and involvement. Finally, the isolation of the Blackfoot and Fort Hall communities from one another—politically, socially, and economically—reduces the likelihood that young people and adults from one community will take advantage of services offered in the other community.

The challenge ahead for the Family Technology Centers in Blackfoot and Fort Hall may be to draw more fully from the funds of knowledge (Moll, 1992) that the Hispanic and Native American communities share in their current social networks. In addition, to maintain the high levels of support for the centers beyond the life of the grant, the programming will have to match the needs of employers seeking workers with specific kinds of technical skills. Charlie Hopkins, owner of the largest potato-processing plant in the area, noted that the central need for his workers is in the specialized technology for assessing the quality of potatoes. He would prefer to hold mandatory training at the Family Technology Center for his employees, if the software were installed on the PCs at the Stalker center. But he also notes that unless these centers can match more closely the needs of local businesses, he is unsure whether they could help sustain the centers financially. Center co-directors Betsy Goeltz and Mark Kartchner recognize this gap as an important opportunity for 2001, and are eager to adjust their programming to better serve the people and the businesses of their communities.

7. Mott Community College Technology Centers: Strategically Situated to Address Needs

The logo of the horseless carriage found on billboards welcoming visitors to "Flint, the Carriage City" is a reminder that much of Flint's history is closely tied to the automotive industry. With the advent of the internal combustion engine in the late 19th century, Flint's world-class carriage makers began to design motorcars, spawning several major automobile companies, including Buick, Chevrolet, and their eventual parent, General Motors. Through most of the past century, area residents enjoyed a growing economy fueled by the abundance of jobs at General Motors. Flint—about an hour's drive northwest of Detroit—was a city that provided not only jobs, but well-paying jobs, to community members of varying skills and education. With enough experience, for example, maintenance workers could earn more than $50,000 per year. The ready availability of jobs for unskilled and semiskilled workers meant that relatively few residents felt the need to pursue higher education to earn a good wage. In reflecting on those years, Flint residents today will often let a visitor know that "times were good."

In the 1970s, the fortunes of GM—and the city of Flint—began to change. Flint is still recovering from the loss of thousands of automotive-industry jobs (from a high of 86,000 in the 1960s to approximately 25,000 today). Although overall rates of employment in southeast Michigan have rebounded recently to approach the national average, high unemployment still exists among young people (16-24 years) and African Americans (male and female). African Americans account for more than 41% of the unemployed, even though they constitute less than 16% of the labor force in the two-county area surrounding Flint. Within Flint's city limits, African Americans make up more than half the population of 136,000. For significant sectors of the city's population, the GM plant closings and other forms of fallout from the economic downturn have left many without jobs, without academic credentials, and without a suitable support system for gaining new skills, particularly for the information age.

Seeds of Renewal

Despite the city's difficulties, the quality of life in Flint is slowly improving. Although community activities and programs directly supported by GM or the Charles Stuart Mott Foundation have become fewer in number in recent years, grassroots resident groups are organizing community gardens, neighborhood beautification efforts, and lawn-lighting projects. The city has sponsored several successful Community Pride Day celebrations over the past few years and notes a high demand for T-shirts that say "I am taking a step for Flint and Genesee County." The Mott Foundation commissioned the Harwood Institute for Public Innovation to create a tool called Take A Step to facilitate community networking; the tool has been widely distributed through churches, housing organization-sponsored classes, and block clubs. To reduce intergroup tensions, community leaders are coming together to work through their long-held differences at The Place for Public Ideas, a network of leaders and organizations committed to Flint's future. Another organization, the Flint Community Coalition, has sponsored workshops for hundreds of area citizens called "Undoing Racism," a beginning effort to heal racial conflicts in and around the city.

In addition to the growing civic engagement in community life by its citizens, Flint is benefiting from regional changes. A rapid economic expansion in southeast Michigan's "Automation Alley" is turning Genesee County—of which Flint is the seat—into a bedroom community for the new workforce. Many leaders feel that opportunities for economic growth will also develop from the area's strategic location on I-69, a major thoroughfare between the United States and Canada. Others in the community express the view that Flint's Kettering University and other local colleges will attract talented students from around the country and the world, whose abilities will further transform the regional economy.

Technology Education as a Resource for Community Growth

In light of the past quarter century of changes, one of Flint's most pressing needs is retooling its workforce to take advantage of the growing information economy. Career

opportunities have shifted dramatically from the automotive industry to the computer and technological fields. With growth in other areas across the occupational spectrum, assembly-line manufacturing is the only employment sector still showing a decline. GM's former dominance in the area has resulted in a workforce that is trained primarily in skills needed for manufacturing, not for the current growth fields. Projections are that over the next few years the fastest-growing and the highest-paying occupations in the region will be in information technologies: computer engineers and system analysts.

Developed as a response to the need for computer-related training, Mott Community College's Community Technology Center program serves residents of Flint as well as the surrounding townships in Genesee and Shiawassee counties (a metropolitan population of 470,000). The college itself is an important partner in many local networks and initiatives, leveraging its relationships to provide high-quality service to the people of the area. This strategy has helped build the Community Technology Center program.

One of the most significant partnering efforts currently under way at the college involves the creation of a $40 million, 180,000 square foot Regional Technology Center designed to retool Flint's workforce for the information economy. This regional center will become operational in 2002 at the earliest. In developing plans for the center, leaders at the college, including Dr. Allen Arnold (immediate past president) and Scott Jenkins (vice president), looked for intermediate measures the college could take to improve the regional center's usefulness and success. Arnold, Jenkins, and others decided it was important to provide potential users with basic training in computers and the Internet before the opening of the regional center. This basic training would accomplish two primary goals: (1) to better allow participants to take advantage of the more extensive training that would be offered through the new regional center, and (2) to encourage community members to develop an interest in computer careers by reducing fears and helping individuals realize their own capabilities in learning to work with technology. Given these goals, in 1999, the leadership at Mott Community College (MCC) decided to apply for a Community Technology Center grant through the Department of Education's new initiative.

Arnold and Jenkins knew that to reach Flint residents they would need to bring the idea of computer access and skill-building to them through trusted community leaders and organizations. Taking this approach to the field, they contacted the Great Lakes Baptist District Association (GLBD), the Disability Network, and the American GI Forum (AGIF). The GLBD was the logical link to the African-American community in the city's North Point area; if the association's pastors supported the idea of a technology center, then members of their congregations would support it, as well. To give them a concrete sense of the possibilities, Jenkins arranged for a group of pastors to visit technology centers in La Puente, California. MCC sought to involve the Disability Network as a means both for reaching the disabled population and for using the Disability Network's expertise to ensure that any community center funded by the grant would have the assistive technology needed to serve anyone, regardless of their physical challenges. To reach Flint's Hispanic community, MCC's leadership pursued a partnership with the AGIF, a Hispanic veterans' organization.

Interest from all three community organizations—the GLBD, the Disability Network, and the AGIF—created the basis for the establishment of three distinct centers serving the needs of diverse populations. Additional support for the centers came from Mark Hope, the college's Director of Information Services, who planned the technology infrastructure, opened the college's network for the centers' access and use, and committed the resources for ongoing technical support for each center. Other key personnel at the college, such as Judith Cawhorn, Executive Director of Grant Development, emphasize that the college is "supporting the effort of this program 100%." In addition to obtaining funding through the Department of Education's Community Technology Centers program, the college issued bonds to generate funding locally and is ready to pursue a millage issue to provide additional funds.

One of the most important resources the college has committed to the community technology centers is Project Director Robert Matthews, who was transferred to the project from the college's student advising staff. An energetic man, proud to be a lifelong resident of Flint (except for a brief foray at law school), Matthews has a deep knowledge of the community, along with the humor and sensitivity to move seamlessly

between the partner organizations in the project. Both in word and in deed, Matthews reflects the college's position, that although the MCC is actively involved in establishing and maintaining the three community technology centers under its purview, the college sees each of the three community organizations as the "real owners" of the technology centers. Matthews and several of the MCC's administrative staff reiterated the idea that the college's role is to provide support and technical assistance for the three centers.

When the Department of Education funding came through in October 1999, the three partner organizations were in different stages of development. The Great Lakes Baptist District Association owned a building and had strong organizational and community networks in place. The Disability Network had its own building, a stable staff, and a history of foot traffic to its offices. The American GI Forum had a volunteer organization with strong ties to the Hispanic community and a successful history of raising funds for scholarships, but no building and little formal organizational structure. Leaders at the college decided to begin with the GLBD by creating an office, computer lab, and conference room within the shell of the organization's existing building. Construction was completed and a site coordinator was hired in May 2000. The center opened its doors soon thereafter.

As of February 2001, only the GLBD center has opened its doors for participant use. Both the Disability Network and AGIF centers are still in preparatory stages. Although according to MCC leadership, the overall planning and management of the community technology center program have gone smoothly, the delays the college has experienced in opening two of its three planned centers indicates the complexity of working with diverse partners to build programs from the ground up. Also affecting the situation is the college's expectation that each center will become self-sustaining. Toward this end, MCC has invested a considerable amount of time in supporting general organizational development for each of its partners. Although this strategy seems appropriate to everyone involved, it has changed the timeline for opening the centers. An additional factor influencing the progress of the community technology centers is the Regional Technology Center the college is planning in collaboration with other workforce development organizations in southeastern Michigan. While MCC is trying to

get the local community technology centers up and running, it is also committing staff and planning resources to the regional center.

Two major factors have influenced the planning and preparations for the Disability Network center. First, the Network was not able to use the space it had originally planned to house the center and was consequently required to build an addition to its existing facility. Second, to accommodate the President's visit in September 2000, the center's focus shifted for a time from programming and staffing to constructing and equipping the center. The completion of the physical site has allowed program developers to again focus on staffing and programming issues, which are considerable, given the complex skill sets and training involved for such a center. Nonetheless, the Disability Network center is likely to open by the spring of 2001. The AGIF is experiencing more significant delays. The Forum is still in the process of refurbishing the building it will use to house its technology center, which will probably begin operations in the fall of 2001.

Once all centers are open, the aim of Mott Community College is to offer Flint area residents the opportunity to build computer skills, with the ultimate aim of transforming the regional economy through transforming its workforce. Located in the heart of the communities they seek to serve, the centers also plan to offer access to MCC classes, administrative offices, and student advising personnel through Internet and videoconferencing options for those not able to make the long bus ride across town to the college. The centers are especially gearing themselves to serve single parents by providing children's programs simultaneously with the adult programs. Another benefit of the development of the centers already being realized is the strengthening of the local communities. For the AGIF, for example, planning for the technology center has spurred the development of a full-service center for the Hispanic community, with a variety of educational, cultural, and health programming planned for the site.

The full impact of the centers will not be known until all the centers are established and in operation for a period of time. Many of the project's most important goals, such as attracting new businesses to Flint, will be able to be assessed only in conjunction with the assessment of the Regional Technology Center, which is still in its

planning stages. Despite the long-term view required, the project stakeholders, both at the college and in the community, share a commitment to MCC's community technology centers and agree that the centers are one of the best hopes for effecting vitally needed economic solutions in the community.

Reaching the Diversity of the Population

Each of the planned centers is poised to reach its targeted communities in particularly appropriate ways, combining the project partners' deep knowledge of local constituencies with technical and organizational expertise from the college. Robert Matthews notes:

> Although they [the three centers] have the commonality of addressing digital divide issues, they each have been allowed to take on their own shape and have their own flavor.…A lot of what is happening and what has happened is really capacity building for the organizations, identifying the unique needs that their constituents have.

Although the process of equipping people with technological tools and skills has begun, each of the centers faces challenges in reaching its goals.

The Great Lakes Baptist District Center Program

In 1998, representatives of congregations affiliated with the Great Lakes Baptist District Association began meeting with representatives of the college to discuss the possibility of developing enrichment programs that would benefit not only their congregations, but members of the community at large. Computer technology was the primary focus. To address the new direction of the association more effectively, a new nonprofit organization named the Faith Based Development Corporation is currently being formed. The Articles of Incorporation of this new organization state the following

aim: “The development of computer training and enhancement of computer literacy; and to otherwise, develop job skills for members of the community.”

The GLBD has come a long way toward achieving this aim. It has successfully transformed part of a building it owns in Flint’s largely African-American North Point community into the community technology center. Although previously this building was rarely used and had little to attract members of the community, this situation is now changing. The dedication of the technology center in May 2000 attracted approximately 200 people. The center’s interior walls are lined with the names and photographs of 20 neighborhood ministers whose congregations have donated $2,000 each to the overall center project. The GLBD has also hired an enthusiastic and trusted community member, Darwin Hamilton, as site coordinator, and an intern from the college as a program assistant. Additionally, a computer youth camp the GLBD held in the summer of 2000 proved the organization capable of implementing attractive programming for community members. With these essential components in place, slowly but steadily more and more participants are using the center, finding ways in which its resources and services can be of value to their lives. Still, the GLBD center has a long way to go.

Community members involved in the project identify a key obstacle to greater center use and community participation: fear. Robert Matthews expresses it as follows:

> [We are] working to overcome some of the initial fears that people have about this technology thing. What does this really mean to me? Well, I know everyone uses computers, but what does that really mean? And to be quite honest, particularly in our community, I think there are some—there are some fears of just the whole notion of technology being intrusive and everyone knowing your business and that sort of thing, people feeling like can I really—can I make a mistake? That sort of thing is there. Can I mess something up?

Matthews specifies three types of fear discouraging use of the GLBD center: community members’ fear of the unknown, their fear that information technology could

be used against them, and their fear of their own inadequacies in learning to use computers.

The leadership of the Great Lakes Baptist Center has developed a strategy to confront this problem. To build on the trust the congregations of the associated churches place in their own ministers, the GLBD leadership plans to align closely with these ministers. As a first step, the GLBD has organized a workshop to be held in February 2001. Along with one volunteer from each of their congregations, ministers from each congregation will receive basic training in computer skills and simple Web page development. The goal will be for each of them to build a Web site for their congregation. It is hoped that the outcomes of the workshop will motivate others in the congregation to make greater use of the technology center. As Matthews notes, "We still are working to really make the neighborhood and the neighbors really feel a strong sense of ownership in the center."

Despite the time it is taking to engage significant numbers of participants in using the center, many in the community continue to see the center as the community's best hope. Reverend Threlkeld, a local minister serving with the GLBD Association, speaks with excitement about the center, recounting the "fall" of the city of Flint and how the center project is an important step toward helping the African-American community get back on its economic feet again. Reflecting on his own congregation's participation, he looks forward to raising the funds needed to see his photograph on the wall along with those of the other ministers who have contributed substantial funds. Reverend Threlkeld knows, though, that this is just a beginning.

The Disability Network Center Program

The Disability Network's center builds on another goal rooted in community strengths and needs: the inclusion of individuals with disabilities in the region's workforce development. Many who address this issue view technology as a key component in helping individuals with disabilities to make a living wage. The director of Flint's Disability Network, Michael Zelley, serves on local, state, and national workforce

development boards, and also chairs a national blue ribbon task force on digital divide issues and the disabled population. Zelley's nationally recognized expertise may have been a factor leading to the President's visit to the Disability Network's technology center in September 2000, during which he previewed the variety of assistive technologies that will be available at the center once it is operational. Robert Matthews and other college staff believe that Flint's high visibility in this arena can enable the Disability Network center to make a broad impact on the delivery of technology access and workforce development to the disabled population.

The Disability Network center plans to operate on the "one-stop-shop" model. Individuals will come to the center to receive a range of services under one roof: unemployment services, substance abuse help, transportation assistance, clothing for job interviews, and information on job training opportunities. With the addition of the technology center, individuals will also be able to gain access to a wide array of assistive technology that they would not be able to afford themselves. In addition to computers, networked printers, and adjustable-height tables, participants will be able to use an array of highly specialized equipment, such as a hands-free pointing device, on-screen keyboard software, adaptive keyboards, screen magnifiers, a hands-free input system that uses biofeedback, and many other innovative technologies. There is also videoconferencing equipment at the site.

The Disability Network's motto, "Independence Beyond Disability," aptly sums up its vision for all of its services, including those provided through the community technology center. John Burt, Support Services Manager at the Disability Network, sees the community technology center functioning as both a computer training center and a testing ground for individuals with disabilities and employers in the region to discover which assistive technology works best for them. Burt and others place strong emphasis on practical assistive technology that can be used with any software, so that disabled individuals can participate in the workforce independently of specialized software or costly devices that are prohibitive for many businesses. Supporters also envision the center as a community meeting place—a "melting pot," as Burt puts it—enhancing life experience for disabled participants and others through dialogue and exchange.

Concomitant with the development of the Disability Network's technology center, Michael Zelley, John Burt, and leaders at MCC are planning ways of building regional capacity in assistive technology expertise. One facet of these plans is the creation of an assistive technology certification program led by Burt, who is himself one of the few in the country certified in training people to identify and use assistive technology. The college's plans also include developing assistive-technology capacity at its other technology centers, creating information dissemination networks for community-based organizations in the region, and providing assistive-technology consulting services regionwide.

These plans fit with the Disability Network technology center's larger vision. As it showcases practical applications of assistive technology for observers on local, state, and national levels, the center will effectively be advocating for greater inclusion of disabled individuals in the workforce. Closer to home, by bringing together a mixture of individuals with and without disabilities seeking to enhance their technology skills, the center is positioned to increase community awareness of what individuals with disabilities can do.

The Hispanic Community Center Program

Planning for the community technology center is serving to strengthen a promising partnership the college has had for some time with the American GI Forum, a grassroots service organization founded by Hispanic veterans. Through a bit of serendipity, as the college was in the process of both developing its technology center plans and seeking to increase its ties with Flint's Hispanic community, the AGIF became the recipient of a bank building that had been closed for several years. The college is now in the position of being able to help the AGIF establish a physical center for a wide range of programs and service. In partnership with Flint's Resource Center, a local agency that aids nonprofit organizations, the college is also helping the AGIF create the

more formal organizational structure necessary to seek foundation and government funding by obtaining 501(c)(3) status and creating an advisory board.

Establishing both its community center and its status as nonprofit means dramatic changes for the AGIF. This "very, very grassroots organization," as one college official described it, is highly enthusiastic about its transitions and the future benefits of its work. Sarita Mora, Pablo Lopez, Domingo Berlanga, and others of the Forum's most active members speak excitedly of the technology center's promise in supporting education in their community, confirming their view that technology skills are a critical component of contemporary education. Education is at the heart of the AGIF's work; the organization raises scholarship funds and has as its motto "Education is our Freedom and Freedom Should Be Everybody's Business." The Forum also seeks to serve whole families with the educational, health, cultural, and civic-oriented programs it is planning to provide in its new center. Given its plans and aspirations, both AGIF members and technology center supporters at the college see a good fit between the two organizations.

Challenges

Through the fall of 2001, the MCC Community Technology Center program will be focusing its attention on two basic efforts: (1) opening the doors of the Disability Network and AGIF centers, and (2) developing compelling programming that meets the needs of local communities by drawing them into each center and its activities. The technology center program has tremendous assets to build on, and it is working to do so. Making its program offerings relevant and accessible enough to attract large numbers of community members to the center is the clear next step for the GLBD site. The other sites may face the same challenges when they are fully operational.

The GLBD, Disability Network, and AGIF centers have a broad and high-level goal to reach. Reflecting both satisfaction with their efforts to date and the long-term confidence the MCC leadership places in the technology center program, Judith Cawhorn restates the program's aims with regard to the Regional Technology Center:

> We recognize that the folks that are going to access these high-tech jobs will come to the doors of the RTC with all kinds of different levels. Some will come fresh out of high school, out of these tech prep programs that we're engaged in to help students understand working in manufacturing technology and information technology is not just dirty-fingernail jobs, but it's really good professional jobs. But many more will come from a group of folks who have limited skills. They've been production workers. So we want to make sure when those doors open that we really make a dent in the folks that are at the lowest economic rung of the ladder in the community, and that they are able to leapfrog into those higher-tech jobs.

The Mott Community College program is aiming high, like other community technology center programs in the nation, to fundamentally transform the local workforce to meet the needs of a new era.

8. Digital Family Project in Desert Sands: Leveraging Resources and Cultivating Sustainability to Change Local Culture

The Desert Sands Unified School District sits in the heart of California's Coachella Valley, an important agricultural region and also home to the Bob Hope Chrysler Classic. The six community technology centers supported by Desert Sands' Community Technology Center grant are all in the town of Indio, at the district's easternmost end. Many of the adults in these neighborhoods, mostly first-generation immigrants from Mexico, spend their days climbing to the tops of date palms or bending over irrigated rows of leafy vegetables and other crops to hand pick the produce that is one of the bases for the local economy.

For many people in the neighborhoods served by the technology centers, there is an alternative to earning a living spending long days in the desert sun. West of Indio, toward Palm Springs along Highway 111, the desert sands give way to the lush green of fairways, extending acre after acre between expensive hotels, full-service resorts, and exclusive retirement communities. Maids, cooks, porters, and a wide range of other service laborers are essential to the hospitality industry of the region. English is not a prerequisite for most of these jobs. Despite their availability, however, these jobs do not typically pay a living wage, and it is common for service sector workers—mostly women—to hold two or three jobs to supply their families with adequate income.

In light of these conditions, the Desert Sands Unified School District considers its community technology centers program central to its technology master plan. Under the name The Digital Family Project, the six centers serve several purposes. First, they provide basic access to technology for low-income students and their families through specialized programs and open-use hours. Second, they are key in providing academic support to lower-achieving students in reading, writing, and math through skill-building programs. Students also receive academic support by making use of resources at the centers for help with homework and special projects. Third, the centers house ESL and other adult education classes, providing participants with valuable skills that can help

improve their lives. Fourth, the centers increasingly serve as a key link between school and home for families who otherwise have little connection to the content of their children's educational experiences.

The Digital Family Project, directed by J. Matt Blansett, is built on two fundamental strategies: (1) leveraging the community's existing resources and (2) working for program sustainability through judicious partnering and through encouraging local control of each community technology center site. The project is ultimately envisioned as a means of creating new modes of learning and participation in civic life, and although the stakeholders recognize that such change comes slowly, Blansett and his colleagues actively do whatever possible on a daily basis to effect the change. Working within the Technology Department of the unified school district has given them an advantage.

Playing to Strengths

Situated at the district headquarters in impressive new buildings that visually complement the surrounding desert landscape, the district's Technology Department is a hub of activity and enthusiasm. The Director of Educational Technology and Information Systems, Dr. George Araya, can be credited for much of this. In 1993, he set the goal of providing high-speed network connections to every classroom in the 6-city, 24-building, 21,000-student district. Using microwave technology and CD-Net application software, Araya met his goal a full 3 years ahead of schedule. In 2000, the district won the Computerworld Smithsonian award for its innovative design and use of components in the districtwide system. Computer desktops in classrooms and offices throughout the district portray images of the gold medal presented with the award.

The technological infrastructure at the district supports a similarly impressive set of projects. The district's Technology Literacy Challenge Grant, now in its fourth and final year, is providing 150 hours of training during a 2-year period to each of the 285 participating fourth- to eighth-grade teachers. Using a curriculum developed by the district technology staff, these teachers learn to work with a variety of tools and, most

importantly, extensively practice integrating use of computers into their classroom lessons. In return for their participation, the teachers are given four new desktop computers for their classroom, a digital camera, and a laptop computer. A Technology Staff Development Grant from the state funds an additional 194 teachers at the K-12 level to work in teams integrating technology into their classroom practice. This program lasts a full year and includes 120 hours of specialized practice in using technology in the classroom. Two other major grants are funding staff development programs, which Araya, Blansett, and others at the district offices see as critical to improving the quality of education through the use of technological tools.

The Technology Department sponsors a number of other programs. It has established a networking and cabling course for high school students, and will soon be providing nonlinear-video-editing training to teachers who have completed the Technology Challenge Grant training. The department is developing five portable "technology infused classrooms," in which students each work with a laptop computer and have available a variety of peripherals to use in lessons their teachers have specially prepared for this environment. The department also is developing a wireless Palm Pilot program for seven classrooms, and has plans to develop a program in which high school students will design, construct, and operate an Internet Service Provider in the local region.

Although all these projects are shifting the capacity of students and staff in the district to technically and otherwise support the community technology centers, the project that has had the greatest direct impact on Desert Sands' community technology program is funded through the 21st Century Community Learning Center grants. Desert Sands has used 21st Century funds to establish during and after-school academic support in reading, writing, and math at four district elementary and junior high schools using Computer Curriculum Corporation's SuccessMaker software. These same four schools are also sites of four of the six community technology centers, allowing the district to expand services and cover the costs of hardware, software, staff time, and other essentials by sharing expenses between the two programs. The same staff member, for example, helping a first-grader log on to her account in the skill-building software as part of the

21st Century after-school program also helps the middle-schooler who comes to the center in the afternoon to work on a report. The same computers used by children during the day to improve math proficiency are used by adults in the evening to learn basic English.

In developing the community technology centers, Blansett and his colleagues have maintained the goal of allowing for multiple uses of the same facilities for multiple purposes. A case in point is the purchase of the SuccessMaker software. The district's Adult Education program regularly schedules ESL students on center computers to use the English-language learning features of the program. The district has also invested in NETg courseware, a Web-based collection of training programs for different types of network technician certification. These courses have been offered at three community technology sites, and the district is pursuing partnerships with vocationally oriented nonprofit organizations interested in making use of this resource.

Partnerships with a variety of community organizations have been helpful to the community technology program in the Desert Sands district. Importantly, satellite access centers, complete with new computers, have been set up in three different federally supported housing projects (one labor camp and two apartment complexes) near one of the elementary schools. Originally envisioned as extensions of the after-school centers to allow for continued technological access in the evenings, the satellite centers have been able to maintain after-school programs during times when construction work has closed particular school sites. The satellite sites include up-to-date equipment and are open in the mornings as well as after-school and evenings. Kathleen Wanner, a curriculum specialist and former teacher in the district, has volunteered her time to garner support from local faith-based organizations to staff the satellite centers during daytime hours and provide basic computer training to users. Child-care programs in the housing projects are making it possible for the parents of young children to attend these sessions. For the evening classes, the district's Technology Department has arranged with the Adult Education program to use funds from a Parent Involvement Grant to provide classes in Microsoft Office and NETg-based training programs. (The district does not directly fund the satellite centers, but if one includes these sites, the district is providing services in a total of nine facilities.)

Other partners helpful to the community technology program include the Indio Public Library, which has received training and equipment from the district to expand points of access, and Sunline Transit system, which provides free bus passes for persons using the community technology centers. The Retail Studies Center, an economic development organization housed at the College of the Desert, serves on the Digital Family Project advisory board and provides assistance through adult education classes to persons needing help in basic life skills. The City of Indio, the County Public Library System, a number of local housing corporations, representatives from each of the school sites, and additional community partners and stakeholders also serve on the advisory board.

Despite the large and complex nature of the Desert Sands district's technology projects, the Technology Department is committed to evaluating each component of its program. Dr. Joseph Jesusthanadas from the California State University at San Bernardino has worked closely with George Araya and others in providing formative evaluation of the department's staff development programs, especially the Technology Literacy Challenge Grant. For the Digital Family Project, project director Matt Blansett has adapted reporting formats from the 21st Century project to collect data on student achievement, site-level activities, and additional student outcomes from each of the schools. The district has used both SAT-9 test results and the student levels assessed by the SuccessMaker software to demonstrate improvements in basic language and math skills for students participating in the after-school programs. For example, the district reports, for a sample of third-graders, that most were performing below grade level in both math and reading before participating in the after-school program, and nearly all students were performing at grade level or above after one semester of participation (http://www.dsusd.k12.ca.us/schools/digitalfamily/sitereports/CTC2000AprilSummary.htm). SAT-9 test results show substantial gains as well (http://www.ccclearn.com/company/cust_succ/cust_suc13.html, and also http://www.dsusd.k12.ca.us/Schools/digitalfamily/). The Technology Department offers the following summary of its internal evaluation:

> We are using the Stanford 9 Math and Reading scores for spring 1998 as our baseline scores. This data is used to assess the overall academic improvement

> generated through the presence of the Digital Family Project at our schools. It is our belief that students and families participating in the Digital Family Project affect the culture of the entire school and raise hopes and expectations for the surrounding community. (http://www.dsusd.k12.ca.us/schools/digitalfamily/)

As project director and primary evaluator, Matt Blansett keeps a close eye on what is happening at each of the sites. An efficient and well-organized manager with many years of classroom experience, Blansett regularly assesses the challenges and progress toward solutions of problems at each community technology center site. One of the major challenges for several schools during the first year of the grant was lack of facilities and consequent disruption of programming because of renovation of school buildings. Blansett encouraged staff at each school to engineer ways of working around the problems they were facing and, in the end, was able to establish working facilities for all the targeted sites.

One of the greatest local strengths that the Digital Family Project draws on is the commitment of the Technology Department staff. Director George Araya and Technology Project Teachers Matt Blansett, Becky Howery, Susan Cox, and Tanya Carter all actively oversee the development and implementation of the department's teaching and training programs. They are enthusiastic about students, enthusiastic about the Desert Sands community, and also enthusiastic about technology.

Many others in the district, particularly teachers staffing the centers, share their enthusiasm. To be most effective, department staff collaborate regularly with interested classroom teachers in evaluating new technologies. One recent, typical morning, for example, a dozen staff and teachers spent several hours together in a demonstration and evaluation of eInstruction's interactive classroom system. In another characteristic event, Araya called an impromptu meeting of the four technology teachers without disclosing the meeting's agenda. When the teachers arrived, Araya presented them each with a digital camera hardly larger than a fountain pen. After admiring the small-scale design and noting the low price, the staff spontaneously discussed the teachers with whom they would immediately "classroom-test" the camera to see the possibilities it would afford.

Departmental staff see technology as a means to other ends, focusing on the ways in which new technologies can improve the lives of children and people in their community.

Despite their own commitment to positive change, Matt Blansett and others running technology projects out of the district offices know that to achieve sustainability for any new programs or practices, teachers and other stakeholders at individual school sites need to be the primary champions of innovations. This principle underlies many of the decisions made in the district's Technology Department.

Sustainability

When the new principal, Esther Lopez, took over Jefferson Middle School in the fall of 2000, she wanted to start afresh. This meant that she would appoint a new coordinator for the school's technology center, and initially have it operate on a much reduced schedule. Although on the surface this move seemed to be a setback for the Digital Family Project, Blansett and others took it as a sign of the Jefferson center's long-term health. Principal Lopez wanted to build a technology center that fit in with the interests of the school's teaching staff, site council, students, and parents. She wanted it to reflect goals expressly developed by the school community.

Lopez and others in the area have seen what can happen when a technology center has the full and well-coordinated support of the community. Just down the street from Jefferson, at Jackson Elementary School, students queue up to use the 40-computer center. The school is planning to transfer the center from the former classroom it is in now to the multipurpose room, making the new location a full-service multimedia center that would accommodate more equipment and users. Dr. Nancy Hill, principal at Jackson, puts it simply, "We love our computer center. Every seat in it is taken up every day. Even if we had 100 computers, every chair would be full every day."

Dr. Hill recounts some of the factors that make Jackson's after-school program a success: the children are required to spend time each day in free play out of doors; the children receive nutritious snacks every afternoon (project coordinator Blansett secured

funding for this through a USDA program signed into law in late 1998); five teachers rotate duty staffing the centers so that no one will experience "burnout." Hill noted other features of the center's use. For example, junior and senior high school students without computer access elsewhere have the resources they need to desktop-publish their science fair and other projects. Adults use the center Tuesday and Thursday evenings for ESL practice using CCC's SuccessMaker software and for general open access. Hill recounts one parent's search for Web-based information on how to pasteurize sugar cane juice. This man located an 800 number, learned the pasteurization process over the phone, and now sells sugar cane juice at fairs in Mexico on weekends.

Jackson's technology program capitalizes on the knowledge of students as much as on that of teachers. Noting how frequently peers answered one another's questions, and, even more notably, how often children offered technological help to adults, Blansett instituted a special tutorial program called "Technology Scholars." The Technology Scholars are fourth- and fifth-graders at Jackson Elementary, both boys and girls, who have shown particular interest in learning about computers. Blansett runs the program after school on Thursdays, taking the students through topics that, in many cases, the students choose themselves. These topics include painting, drawing, and graphics; the Internet and telecommunications; and multimedia production, among others. The class is structured to be as "hands-on" as possible, and allows the participants ample time for discussion about everything from how to build screen savers to observations about the different kinds of ports the children have seen on computers. One of the primary intents of the Technology Scholars program is to create yet another resource for the community technology centers and for other technology-rich programs in the schools. Blansett and others recognize how much students can contribute to the community—and to their own futures—by developing technical skills in the elementary years.

Although Jackson Elementary represents what in many people's minds is the best technology center model in the district, it is not the only model. At Roosevelt Elementary a couple of miles away, the children also fill every seat to capacity each day. Temporarily set up in portable buildings because of construction on the campus, Roosevelt operates its center from two adjacent classrooms that house a total of 45

computers. From the time school lets out at 3:15 until 6:00 each evening, children busily work away on their individualized SuccessMaker programs, taking breaks to have snacks, to write notes about their academic progress, or to surf the Internet or play educational games once they have completed a certain number of SuccessMaker units. The three teachers staffing the center do so every day (Monday through Thursday). One teacher assists in each of the classrooms, while a third teacher, bilingual in English and Spanish, interacts with families. This point of connection between the schools and families is a vital one. Parents whose children participate in the after-school program see that their children are both making academic progress and enjoying the process. As a result, these parents almost invariably take opportunities to observe what their children are doing, often becoming interested themselves in using the software to improve English communication and writing skills.

If teachers are the gatekeepers to adoption of innovations, children are the ones who hold the keys. This observation applies most, perhaps, to the interest children evince in new learning environments and opportunities. Children in the Desert Sands district have responded overwhelmingly positively to the changes brought by the introduction of technological tools in their schools. These changes are twofold. First, the Digital Family Project has extended students' opportunities by allowing them to spend more time making use of new modes of learning and communication. Students show excitement over the progress they make writing reports, developing presentations, and even practicing basic skills using computer technology. Second, the project has created new forms of interpersonal connection and community for the students. Students regularly turn to one another for assistance in the technology centers, engaging in peer-to-peer learning practices that are atypical of classroom life. Students also experience new kinds of links between their wider communities and their schools. The Digital Family Project has hired Community Technicians, familiar faces from the children's neighborhoods, to assist at each site. Blansett describes the role of the Community Technicians:

> These people are an important part of the program since they help develop a sense of ownership by the local community and serve as daily reminders that the

> community technology centers belong to the community. They make it feel like home.

Visitors to the centers can readily verify Blansett's evaluation. At Eisenhower Elementary School, for example, Carlos Silva, a young man from the local neighborhood, assists with the program. During an entire 3-hour afternoon session, the children raise a continuous chorus of "Mr. Silva! Mr. Silva!" as they vie with one another for his attention to show him their latest creation or share with him their latest success. At Jackson Elementary, teachers describe the Community Technician there as "more of a mother figure than teacher figure," to whom both children and their parents relate.

Another way the centers have enhanced connections within the community is by creating opportunities for students to share new modes of learning and personal successes with their parents. One recent afternoon, a group of 12- and 13-year-olds worked on PowerPoint presentations for their social studies class in the community technology center of Wilson Middle School. One boy was putting the final touches on a graphically rich, musically engaging, and textually accurate account of religious tolerance in India during the reign of the Mughal empire. His teacher gently coached while he worked, confident in his technical as well as his more academic skills. Shortly, his mother would be picking him up, again showing the interest she had been showing in her son's work and again being able to see a day's progress in his project. Eventually, his parents might come to feel that they should spend time learning new skills from their son at a community technology center, or they might decide, depending on their circumstances, that he could help them set up and make use of a computer in their own home. This pattern of children leading adults into new forms of learning has happened many times in the district, and is likely to happen more and more.

Even drill-and-practice activities engage students and their families. In journals that the center staff encourage students to keep at Roosevelt Elementary School, children reflect on their own learning. One child writes:

> I like to do Math because I learn more so that I could pass grades and not flunk. Today, I learned more Math and more Reading. I'm learning more and getting better in Math and Reading.

Another child writes:

> What I learned today is that I am doing better in Reading. I remember I use to do good, but now I am doing better than ever. Now I like Reading more. I love doing CCC [SuccessMaker]. It is good that I am learning.

At most of the district's schools served by community technology centers, teachers involve students in family conferences by having the children present their CCC portfolios to their parents. Students are able to explain their level of accomplishment in reading and math, their goals for the term, and the likely amount of practice they will need to reach their goals. Invariably, their children's awareness of the state of their own progress impresses parents. More importantly, students experience the feelings of support and connection that having their parents involved in their educational process brings. One young girl expressed these sentiments in her journal with these words:

> Today I did Reading Workshop. I am finished with Initial reading. I was so surprised when I got on Reading Workshop. It said I passed. I started to feel happy and I think my mom will be proud of me.

In Desert Sands' community technology centers, parents, teachers, community volunteers, junior staff members, and peers express feelings of pride in what children and families are accomplishing. For the participants, the centers provide a new place for achievement, relationships, and identity-building—new kinds of competence in a new type of community that signifies new possibilities. For all its novelty and complexity, the Digital Family Project provides a great deal and promises even more.

Challenges

The Desert Sands Digital Family Project is positioned to take its next big step. Building on the district's technological infrastructure, its extensive teacher training program, and the basic computer skills and habits of use established in students, the project could begin to do more to further serve parents and other adults from the community. Apart from classes taught through its partnership with the Adult Education program, the Digital Family Project has not found a sustainable way to regularly provide systematic training in basic applications and access to relevant content for adults new to the world of computing. A well-conceived and well-publicized program offering training in a range of basic software applications at Hoover Elementary School, for example, had difficulty maintaining its classes because the adult students attended so irregularly. Part of the problem the project faces is that many adults in Indio's lower-income neighborhoods work more than one job, and taking the time for additional training is enormously difficult for these adults.

Blansett and others have considered approaching this problem by taking advantage of the seasonal nature of work in the region. Although many workers in the area need to work more than one shift, the reason is partly that most agricultural and service sector jobs are suspended during the hot summer months. (Families need to save money during the autumn, winter, and spring to meet their financial needs during the summer.) With adequate staffing and a rotating schedule, the technology centers could be put to better summer-time use, but this plan, too, runs into problems. District regulations require that administratively qualified staff be present on-site during all hours of facility use, whether during the school year or the summer. It is difficult for the district to arrange for administrative oversight and to pay for both school administrators and technology center staff during summer months.

Other alternatives potentially exist. The Digital Family Project has successfully established centers at three housing projects in the communities it is most interested in serving. Summer training programs could more readily be run at these sites during summer months, since they are exempt from regulations that apply to the districts'

schools. Taking another approach, the Desert Sands district encourages in-service teachers to acquire their continuing education units by taking courses in technology integration offered locally through extension programs of the California State University at San Bernardino and the University of California at Riverside. Teacher projects that focused on involving parents in their children's learning process could help bridge the intergenerational gap by leveraging students' skills to provide adults some basic familiarity with the function of computers. Blansett is continuously seeking additional partnerships with nonprofit and corporate entities for the purposes of addressing these problems.

For the Digital Family Project to reach its goals, more adults will need technology training, and more will need help with job placement once they are sufficiently trained. Additionally, to attract adults to the center and engage them in the use of tools, the project will need to do more to tap into the interests, backgrounds and needs of the potential participants. In the meanwhile, the project continues to lay the foundation for a robust community technology program by building a culture of technology use in its schools through in-depth training of teachers and a commitment to varied technology-based programs for its students.

9. Cross-Case Analysis: Program Outcomes and Challenges

Although community technology centers funded through the U.S. Department of Education vary with respect to service goals, target population served, location, budget, and phase of development (new versus existing), we observed some common program outcomes and challenges across all six sites we visited. The program outcomes are observable in part because the six new community technology centers we visited have had grant funding for more than a year and a half. But they have also achieved these outcomes by carefully designing educational opportunities and focusing on providing services that meet the academic, vocational, and technical needs of their communities. Similarly, many of the challenges they have faced owe to the centers' status as new organizations in their community. Centers require considerable time to go from planning to opening a facility, and maintaining the long hours required to provide a community access point that is accessible to youth and adults with different schedules is challenging. In this section of our case study report, we explore some of the outcomes and challenges one could expect to observe when visiting a U.S. Department of Education-funded community technology center.

Common Program Outcomes

Community technology centers provide important educational benefits to their communities. From preparing a community's citizens with skills they need for finding jobs to extending the time spent involved in learning activities for young children, community technology centers address educational needs across the lifespan. All six centers have made progress toward many of program outcomes described below. Although not every program within a community technology center could be expected to attain these outcomes, most centers have at least one program that does hope to achieve these goals for its participants.

The partnerships of community technology centers vitalize public schools. In nearly all the community technology centers we visited, one of the key program partners was a public school in the area. In two cases, the grant itself was run by a school district (Desert Sands, California, and Blackfoot, Idaho). Another center was operated by a community-based organization but located in a school (Columbia, South Carolina). Still other centers invited schools to bring students to their facilities to enhance students' literacy skills, as the TLC @ the Armory did in allowing first-graders from District 6 in New York City to attend the Spaghetti Book Club literacy program at the center.

Including a public school as a partner has a vitalizing effect on the school. Participation in the life of the school by parents and community members is broadened. The school becomes recognized as a place of lifelong learning that welcomes input and feedback from participants. For young people, the centers are places where they can do homework. For low-income students with limited access to technology at home, centers enable them to use the Internet to do research for school projects, as we observed in Fort Hall, Idaho, or to complete homework assignments that require them to use word processing programs, spreadsheets, or databases. As teachers assign more work that requires the use of computers, community technology centers may play an important role in ensuring that children without home access to computers are not left behind.

Center programs increase participants' self-efficacy with computers. A second outcome achieved by the centers we visited was an increase in many participants' sense of confidence and competence in using technology. Seniors, who in many cases have never used technology before, often describe a process of transformation in which they begin their first class at a community technology center afraid that they will break the computer and then become excited champions of computer use, encouraging their peers to learn to use e-mail to connect with relatives or use genealogy programs to trace their family's history. Seniors in New York and Blackfoot both shared similar stories; both have been instrumental in bringing new people to the technology center in their community to take classes and explore the world of computers.

Community technology centers achieve these results with participants most frequently by providing classes in basic computer applications, such as Microsoft Word

and Excel. In some cases, participants take classes more than once, so they can master the skills they need to accomplish their individual learning goals. For participants who have attended similar classes offered elsewhere in their community, the classes offered at the community technology centers have two key advantages. First, the classes are free and therefore accessible to low-income residents. In some communities, similar courses might cost up to $300, which would prevent many unemployed adults and seniors from attending. Community technology centers offer a low- or no-cost alternative to learning the basic computer skills that workers need to be considered for jobs in today's economy. A second advantage of community technology centers cited by participants is the patience of instructors. Most centers have selected educators with extensive teaching experience who are committed to helping others learn, no matter how long it takes. These instructors are often also available during open-access hours at centers, and participants in classes show up to benefit from the opportunity for more one-on-one instruction as they become more confident in their ability to use technology.

Center activities prepare people for the workforce. A chief aim of some of the centers we visited was to prepare young adults to enter the workforce. Although teaching basic and advanced technology skills is a part of such programs, these programs do more than teach basic computer literacy. Some programs, like Street Tech Academy in Oakland, seek to transform participants' sense of themselves as professionals ready for demanding jobs in today's workforce. The Oakland community technology center teaches participants the habits of being on time, dressing professionally, setting goals, and working on a team while at the same time preparing students for high-paying jobs in network administration. By all accounts, the program has been a success so far. Of the 18 students in Street Tech's first class, 15 are working in full-time positions with average salaries of $18/hour.

In Oakland, Indio, and other communities, staff at community technology centers have sought in many cases to link their training programs to recognized certification programs. A number of community technology centers offer classes that lead to A+ certification, Cisco certification, or certification in different levels of competence with Microsoft's productivity tools. Still others focus on providing participants with an

opportunity to learn basic technology skills to meet the expectations of prospective employers. Sonia Martinez at Job Service in Blackfoot, for example, refers her clients to the community technology center to practice keyboarding and word processing skills, basic technical skills required for many jobs in the community. The center there, like many others, has software available that scaffolds successful resume development, providing samples that participants can view and design templates that provide a professional look and feel to the resumes.

After-school programs at centers extend the time that school-aged children spend reading, writing, and solving mathematics problems. Researchers have found that making sure young learners have ample time to practice emerging reading and writing skills is critical for literacy development (Committee on the Prevention of Reading Difficulties in Young Children, 1998). Many community technology centers provide time for students to spend reading and writing or composing text on a computer. For example, young participants at the Desert Sands community technology centers, for example, practice reading, and mathematics problem-solving skills using Computer Curriculum Corporation's (CCC) SuccessMaker software. Students in Blackfoot and Fort Hall, Idaho, practice reading with Lightspan's Achieve Now software, supplemented by the use of School Renaissance's Accelerated Reader to assess reading skill. First- and fourth-graders have opportunities to practice writing after school in the Spaghetti Book Club at the TLC @ the Armory.

Many of these software programs are in use in regular classrooms and computer labs across America's elementary schools. The use of these programs in community technology centers extends the time students spend mastering phonemic awareness and sound-letter correspondences, and inferring meaning from texts, some of the specific literacy skills that are targeted by the software programs designed by CCC, Lightspan, and School Renaissance. Many of these vendors have conducted their own research that suggests that the use of such software in schools can improve reading achievement (Gwaltney, 2000; Lightspan Partnership, Inc., 1998). The Digital Family Project in Desert Sands, which provides academic support to lower-achieving students in the areas of reading, writing, and math through skill-building programs, has conducted internal

research on the program showing that the program has a positive impact on reading test scores. In future years of the Community Technology Centers program, it will be useful to examine whether gains in reading or in time spent reading and writing can be found across different programs.

Activities for youth provide an engaging alternative to the traditional school learning environment. Some adults and older youth associate school buildings with past failures and social isolation, and yet they seek out learning opportunities within community organizations where they experience trust, respect, and success (McLaughlin, Irby, & Langman, 1994). For community technology centers that are located within schools, it is important that the space is inviting for these youth and adults and provides ways for them to learn that do not reinforce past negative experiences in school. The directors of the Family Technology Centers in Blackfoot took this fact into consideration in locating one of their centers near the entrance to the school building, ensuring easier access for the community. Dee Albritton ensures that student participants in her program participate in after-school programs in a different way than in their regular academic subjects by engaging them actively in open-ended exploration of technology tools. She allows youth participants and volunteers alike to take on the role of teacher and mentor, providing them with an opportunity to experience learning from a different perspective.

A number of community technology centers' programs we visited had attracted participants who were seeking to advance job skills or learn basic computer skills outside traditional schools. The Street Tech Academy, for example, included a number of young adults who did not have college degrees but who were nonetheless seeking to advance their skills so that they could expect to earn as much as college graduates in the workforce. The program created expectations for a workplace-like setting (rather than a school setting) that helped participants gain an understanding of both the skills they would need to learn and the contexts in which they could expect to find themselves on the job.

The informal and formal peer support and collaboration opportunities in community technology centers also can offer participants expanded opportunities for developing a sense of community and for acquiring a sense of ownership within their

programs. In programs like Urban Voice in Oakland, the Spaghetti Book Club in New York, and the after-school robotics classes in Columbia, program developers have blended their understanding of how people learn with their understanding of how people develop and grow through the opportunities and supports for taking responsibility for learning that can be provided in community-based organizations.

Common Challenges for Community Technology Centers

Although the idea of providing opportunities for people to learn how to use new technologies in community settings is not new, the movement to build a nationwide network of community technology centers is a relatively recent phenomenon. It has been supported by the efforts and research of CTCNet, a national network of community technology centers that, among other things, provides technical assistance to centers. The need for such assistance is clear, given the challenges that the centers we visited as part of this study face in planning and implementing programs.

Start-up takes longer than many programs expect. For staff in community-based organizations, starting up a new program often takes time, but many of the factors that affect how quickly a program can be implemented are familiar to experienced program developers (e.g., availability of persons for meetings, hiring of staff). But opening a community technology center often introduces new variables that are not always well understood by staff from these organizations. Buildings must be wired and sometimes refurbished. Climate control in rooms where computers are located is often an issue; new heating and cooling systems must often be installed. Computers must be purchased and networked, and staff with specialized skills in both teaching and technology must be found.

Most centers we visited took from 6 to 8 months to open their doors for classes from the time they were awarded a community technology center grant. First-year grantees (FY 1999) are therefore just beginning to show positive results from their programming efforts and making their first adjustments to their schedules and program offerings, based on what they've learned. Much is needed to help grantees navigate

through the choices they must make when opening a center. Materials developed by CTCNet, such as its Center Start-Up Manual (http://www.ctcnet.org/toc.htm) are useful; but it is unlikely that the time it takes for a center to move from plan to program can be shortened significantly. Future evaluation plans should take into account the fact that centers need at least a year to develop programs before they can be expected to show significant results and benefits to communities.

Centers have had trouble finding and developing local content and curriculum. A number of centers we visited had struggled to find content and curriculum that matched their goals and their community's needs. One center that had planned to offer a technology-enhanced ESL class has been unable to locate software that could help English Language Learners hone their skills through extended opportunities for computer-based practice. In another center, staff decided to use games designed to teach young children how to read for the ESL class, even though the participants were adults. Centers have been successful in finding educational games for younger students to play, but many of the games and learning activities fail to connect with participants' life experience; they fail to draw on the rich funds of local knowledge (Moll, 1992) that are a part of ethnically diverse communities.

The problem faced by community technology centers in finding relevant content and curriculum is not caused by a lack of imagination or initiative; there are, in fact, few technology resources available for teaching and learning engaging content in low-income communities. Other researchers have found that Americans from low-income communities find that the Internet has little content suited to their particular needs and interests (Lazarus & Mora, 2000). Most of the content on the World Wide Web, according to the researchers, cannot be understood by readers with limited literacy skills and contains very little community-specific information. What adults and youth in low-income and underserved communities want when they use the Internet is easily searchable content that lists opportunities for jobs, housing, and community participation (Lazarus & Lipper, 2000). It is not surprising, then, that many community technology centers struggle to find relevant content and engaging curricula that they can use to attract participants to the centers and build on their existing skills and knowledge.

Centers have struggled to keep up with the demand to stay open on weekends and holidays. Recognizing the need for technology access, many of the centers planned for full classes and computer labs. Many centers in this program currently stay open late at night and are open on Saturdays. At the same time, centers are short-staffed, and not all of them can be open both days on the weekend or on holidays, when demand is sometimes higher. Moreover, most of the centers we visited said that demand for some programs and populations, especially for seniors, was even greater than expected. Participants have asked that the community technology centers be kept open longer hours and offer more classes.

Center staff have struggled to keep up with demand, adding new classes and juggling staff schedules, where possible. Most centers have just one or two staff members available to teach classes, though, so it is difficult for them to offer classes both during the daytime and at night. Very few staff would have the opportunity to take time off if the centers were open 7 days a week; yet the community technology centers we visited with problems of high demand were still trying to come up with ways to meet community demand.

Centers have not developed strategies for staff development. Nearly all of the staff members of community technology centers were energetic and committed to the mission of providing technology access to people in low-income communities. Many were also skilled educators; a number were certified teachers. Still others brought specialized training in youth development or in job training to the centers where they worked. A few had specialized technical skills or even specializations in educational technology, but most were instructors first and technologists second.

Few of the centers we visited had developed plans for professional development for their staff. The one center that had a particularly strong professional development component was run by the school district's technology office, so staff had ready access to a number of experts in integrating technology into teaching practice. Centers were more likely to be focused on getting up and running, with time for professional development viewed as important, but of secondary importance to meeting the goals of the CTC grant in a short period of time. Yet many staff were not experts in new technologies, especially

multimedia tools, and were learning on the job the value of the Internet for learning, where to find curriculum resources, and how to troubleshoot a network. As centers develop, it will be valuable for them to provide time for staff to learn, both formally and informally, how to use and teach with new technologies so that they understand what technologies can and cannot do to meet programs' and participants' learning goals.

Centers are concerned about long-term sustainability. The centers we visited are all planning 2 years ahead, when they will no longer have federal funding. In some cases, school districts and community-based organizations have already promised to share some of the costs of operating the center. In other centers, there is a strategy for raising funds to support center activity through new grants or private donors. At least one center is considering offering courses for a small fee, but no concrete plans have yet been developed that would ensure the financial stability of the center beyond the life of the grant.

The task ahead for the first round of grantees in the Community Technology Centers program is to continue to develop community ownership of the project and identify external funding sources to keep centers open and expand program offerings. The matching requirement and strong community buy-in required as a condition for funding provide centers with a strong base of support, but centers will have to be entrepreneurial if they are to survive beyond the life of the grant. Evaluation efforts in future years should investigate the strategies that centers are developing to sustain themselves beyond Department of Education funding and to create buy-in from community investors.

References

Barley, S. R., & Orr, J. E. (1997*). Between craft and science: Technical work in U.S. settings*. Ithaca, NY: Cornell University Press.

Brown, A. L., & Palincsar, A. S. (1989). Guided, cooperative learning and individual knowledge acquisition. In L. B. Resnick (Ed.), *Knowing, learning, and instruction: Essays in honor of Robert Glaser* (pp. 393-451). Hillsdale, NJ: Erlbaum.

Castells, M. (2000). *The rise of the network society (2nd edition).* New York: Blackwell.

Committee on the Prevention of Reading Difficulties in Young Children. (1998). *Preventing reading difficulties in young children*. Washington: National Academy Press.

Gee, J. P. (1997*). The new work order: Behind the language of the new capitalism*. New York: Westview Press.

Gwaltney, L. (2000, June). *Year 3 Final Report: Lightspan Partnership, Inc. Achieve Now Project, Wichita*. San Diego, CA: Author.

Hipps, J. (2000). *An Evaluation of East Bay Neighborhood Links After-school Component, Year One, 1999-2000*. Oakland, California: WestEd.

Lazarus, W., & Mora, L. (2000). *Online content for low-income and underserved Americans: The Digital Divide's new frontier*. Santa Monica, CA: The Children's Partnership.

Lightspan Partnership, Inc. (1998). *Analysis of achievement and other gains.* San Diego, CA: Author.

McLaughlin, M. W., Irby, M. A., & Langman, J. (1994). *Urban sanctuaries: Neighborhood organizations in the lives and futures of inner-city youth*. San Francisco: Jossey-Bass.

Moll, L. (1992). *Funds of knowledge for teaching: Using a qualitative approach to connect homes and classrooms*. Theory into Practice, 31(2), 132-141.

Nicolopoulou, A., & Cole, M. (1993). Generation and transmission of shared knowledge in the culture of collaborative learning: The Fifth Dimension, its playworld, and its institutional contexts. In E. Forman, N. Minick, & C. A. Stone, eds. *Contexts for Learning: Sociocultural dynamics in children's development*. Oxford: Oxford University Press.

U.S. Department of Commerce. (1999). *Falling through the Net: Defining the Digital Divide*. Washington, DC: National Telecommunications and Information Administration.

Wood, D., Bruner, J. S., and Ross, G. (1976). *The role of tutoring in problem solving*. Journal of Child Psychology & Psychiatry & Allied Disciplines, 17(2), 89-100.

Appendix: Interview Protocol Sample

CTC Case Study: Center Director Interview

Community Context

Tell me a little bit about this neighborhood and community. What's important for community-based organizations here to know a difference in the lives of people here?

What assets or strengths of the community does this CTC seek to enhance or build upon?

What do members of the community want from the CTC?

What needs of this community does the CTC seek to address?

Program Implementation

Origins

How did the center begin? What was its original vision and mission? Prompt if needed for use of research in program design, for stakeholder involvement, and original funding sources.

What is your approach to ongoing goal-setting and strategizing for the center? Who is involved in this process, and how?

Funding

Is your center financially independent, or is it part of a larger organization? If part of a larger organization, do you receive funding from that organization?

In addition to funding from ED, are there additional sources of funding for your CTC? What proportion of your funding comes from CTC? Prompt if needed for the history of the center's funding.

What sort of reporting is required from your funders? Are there specific measures or indicators that you are required to use?

Since starting the CTC, have there been times when you've worried about ongoing funding? Prompt for description of cash flow.

Technical Infrastructure and Challenges

How did you or your predecessor decide what kinds of technology to buy? What kind of long-term plans do you have for equipping the center?

Hardware:

Can you tell me about the hardware you have here, its age?
Ask for number of:

_____ computers in total
_____ processors or 266mHz or more
_____ CD-ROM drives
_____ video and sound cards
_____ Internet access by modem
_____ Internet access by high-speed connection

Does the center have other technology? (e.g. scanner, digital camera?)

How many of these computers have been purchased with funds from the CTC grant?

Has there been any technology donated to the center? If so, what specifically has been donated?

How adequate is the hardware you have for your needs?

Software:

What are the main software applications that you have here and use in different center programs?
Ask about these uses of software:

_____ games for practicing skills
_____ simulations or exploratory environments
_____ encyclopedias and other references on CD-ROM
_____ word processing
_____ presentation software (e.g. PowerPoint)
_____ graphics-oriented printing (e.g. Print Shop)
_____ spreadsheets or database programs (to create files or add data)
_____ HyperStudio, HyperCard, or other multimedia authoring environment
_____ Web page development software
_____ Internet browser
_____ email

How do you find out about new, interesting applications that come on the market?

Connectivity:

What kind of Internet access do you have? Prompt for upgrade plans if do not have T1,DSL, or other high-speed connections (e.g., ISDN, cable modems). Are the computers here on a local network? What kinds of things are shared on the network—files, software?

Participant and Use Data:

Tell me a little bit about the backgrounds of people who come here. For example, what's the average age of people who come here? What percentage of your users are 16 or older and out of school?

Do parents come to the center with their children?

How do you recruit participants? Are people referred to you by other centers or agencies?

How many people come through here each day?

What would you say are some of the reasons why people come here? Do people of different ages come for different reasons?

What are the hours that people use the center? Prompt for hours of operation.

Do you think that the population you're trying to serve has the access they need to the center? For instance, is there a bus here for people who need it? Are you able to stay open when people can be here? Are there enough computers for the people who want to use them?

Do people find the tools they want when they get here? Are there enough of them to go around?

Technical Support:

How much user time do you lose because of technical problems? Is this a big problem? Prompt for reaction of center participants.

What do you do when you have a serious technical problem? Prompt for in-house, real-time online, and paid or volunteer outside sources of support.

Facility:

Do you think the center's space is suited to its uses? What would you like to see improved? Prompt to see if there have been changes of locale, and for criteria for choosing a space.

How does the space fit with your budget? What are the leasing and maintenance costs?

Instructional Success Stories and Challenges

Describe for me the different classes, tutorials, or activities that you have at the center. If appropriate, prompt for inquiry- and project-based learning.

What's the range of things people do when they come to the center? What's the most popular? Prompt to find out if activities are available for different age groups and whether or not there are joint activities for parents and children or other intergenerational activities.

Think about someone who comes often to the center: What's the range of activities they participate in? Do they use many different technologies and applications, or focus mainly on one?

What kinds of things do you hope they will do when they're in the center? How do you go about helping this to happen?

Can you tell me about a good learning experience that one of your participants had? Prompt for why this was a good learning experience. If appropriate, prompt for guiding ideas about learning.

How do you go about determining what people are learning here? Do you use this information to shape future programs and activities?

What are some of the ways you've tailored your programs to reflect the diversity of people who come here?

Have you ever tried addressing in any of your programs some of the legal and ethical issues in technology use? Issues such as privacy, copyright, censorship, etc.

Staffing

What training and technology experience do your staff have? Prompt for particular staff members in each of their roles.

Many of us know a lot about the kinds of technologies we use every day. Others may know more, and be good at problem solving with computers no matter what they're working on. They seem to have a good grasp of principles that apply across technologies. Are your staff more skilled in the particulars of programs they've used, or do they have a good grasp of information technology concepts? Prompt with examples if needed.

What kinds of help do participants ask your staff for? How do they go about helping people find the kinds of tools and other resources they need?

How do your staff themselves learn more about the kinds of technology your center uses?

Do staff themselves in use of technology for productivity and communication?

What kinds of training and professional development do the staff have access to? Is there a plan for ongoing staff professional development? Are their training needs that you cannot meet, (such as for budgetary reasons)?

Do the staff have time set aside to plan new programs and activities for center participants?

Center Leadership

Can you tell me about a major problem you've faced since starting the center and the way you and the people in your CTC went about addressing it? Prompt for how they involved others.

Do you feel you have enough time to plan and reorganize for the future? How do you generally go about doing this?

Involvement of Stakeholders

Tell me who you consider to be your key stakeholders. Prompt for parents, participants, community partners, board members, employers, etc.

In what ways are these stakeholders involved in your programs and activities? Prompt for parent involvement in youth activities. Local business involvement?

In what ways do stakeholders get involved in planning and helping direct the center? Prompt for community members involvement in decision-making processes. How involved is your board in guiding the center?

What are the ways you communicate with center participants? With community members? With board members? With other organizations? Prompt for both mode and frequency.

What kinds of partnerships does the center have with non-profits and educational organizations? How do these relationships benefit your users?

What kinds of partnerships does the center have with businesses? How do these relationships benefit your users?

Distant Outcomes

Do you have information about ways in which the center has helped participants?

Are there ways that participants have benefited socially from their participation in the center? Prompt for the safe and structured environment of the center, development of communication skills, and awareness of career opportunities.

Are there ways that participants have benefited educationally from their participation in the center? Prompt for ability to find and evaluate information using technology, design skills, reasoning and problem-solving skills, and for grades, GED, higher education.

Are there ways that participants have benefited vocationally from their participation in the center? Prompt for new employment, salary increase, promotion, work-related skills certifications, etc.

What kinds of technology skills have participants developed through participation in the center? Prompt for ability to troubleshoot equipment problems, ideas about possible future technologies, understanding of information technology principles, and skills for using contemporary IT.

How has participation in the center affected how participants see themselves? Prompt for autonomous technology use, view of self as competent technology user, ability to critically use technology, sense of belonging and membership in center, increase in personal and social responsibility, increase in faith in the caring nature of others, and increased opportunity for beneficial social, cognitive, and technical outcomes.