The Role of Community Technology Centers in Youth Skill-Building and Empowerment

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Abstract

Recent data suggest that the "digital divide" between white and minority youth persists. While schools, libraries, and other institutions provide important access, another important access location, particularly for low-income youth of color, consists of community technology centers (CTCs). Placed strategically within neighborhoods, such institutions provide not just access, but also skill-building and networking as well as the capacity for youth to both "voice" their stories and contribute to community-building. We use qualitative data collected at five CTCs nationwide to examine the ways that youth engage in CTCs, utilizing the National Academies assets framework to gauge the contribution to the personal, intellectual, psychological and social development of youth. We draw lessons for future CTC practice, highlighting the importance of both bonding and bridging social capital in thinking through future programming.

The pervasiveness of computer ownership in the U.S. s may give the impression that the digital divide has disappeared. While computer ownership and access to the Internet in the U.S. are at their highest levels ever—with more than 60 percent of households having a computer and 55 percent having Internet access—the overall statistics mask important differences among various sub-groups of the population.[1] For instance, estimates from the 2003 Current Population Survey (CPS) indicate that only slightly more than half of all African-American and Latino children and less than half of all children living in families with incomes less than $30,000 have access to a home computer. In comparison, 85 percent of White, non-Latino children and 94 percent of children in families with $60,000 of income have access to a home computer.

In the context of this digital inequality, policy makers have placed the greatest emphasis on securing computer and Internet access for the general public in various locations, most notably public schools and libraries. Due in part to the E-rate program, which allows schools and libraries to purchase equipment at reduced cost, computers are now nearly universal in the classroom, However, the quality of computers, the ratio of students to computers, the length of time students can access these machines, and the hours they are available vary widely amongst schools. Most libraries in even the poorest communities also offer computer and Internet access for the general public, but like schools, quality and availability vary tremendously.

A third point of access outside the home is through community centers, and specifically through community technology centers (CTCs). Founded in 1983 by Antonia Stone, the first CTC, Playing to Win in Harlem, offered basic access to computers to the general public. Today, CTCs offer a diverse array of technology-related and other services in urban and rural communities nationwide. They are located in housing projects, community centers, storefronts, and elsewhere. Services offered at CTCs range from access and basic skills training to highly

[1] According to data from the 2003 Current Population Survey (CPS).

specialized technical training and an outlet for honing these skills. Young people are attracted to CTCs for their state-of-the-art hardware and software, the supportive environments in which to learn new technologies, and the comraderie they share with other young people and adults while at the CTC. CTCs can also play an important role in the community, offering both computer access and other neighborhood services, such as social services, and community advocacy and organizing (Servon, 2003; Pinkett & O'Bryant, 2001; Davies et al., 2003; Pinkett, 2002). Computer access, as well as these other types of services, are likely to be most needed in disadvantaged communities; precisely the communities where computer usage is the lowest.

Data from the 2001 CPS (the most recent dataset in which information about community technology centers was collected) indicate that about 1 percent of young people ages 8-25 used the Internet at a community center, compared to 10 percent who use the Internet at libraries and 54 percent who went online at school.[2] Despite the seemingly low usage rate of community centers, these points of access are growing in importance. Between 1998 and 2001, the community center use rate increased seven-fold. And, for some youth groups, community centers appear to be a particularly important location of Internet access. African-Americans are more likely than whites and Latinos to use CTCs, but evidence suggests that CTCs are not serving only one segment of the population and that their appeal extends beyond simple access. In fact, researchers have argued that defining the digital divide as a problem of access is overly narrow. Servon (2002), for example, defines the digital divide of consisting of access, training, and content components. Our research demonstrates that CTCs also provide the training and content elements that Servon identifies.

[2] These numbers are likely to grossly underestimate points of access for youth under age 18, in particular, because the survey asks parents to identify places where youth use the Internet. Parents may not be fully aware of their children's computer access outside the home.

Although some researchers have looked at the relevance of the digital divide issue for youth and children (Lazarus & Wainer, 2005), no one has explicitly connected the youth development literature with an examination of youth-serving CTCs. In this study, we examine CTCs as a point of access youth in an attempt to understand how youth experience the services and opportunities offered at CTCs and the role CTCs play in disadvantaged communities. We use in-depth case studies at five CTCs nationwide to argue that, despite tremendous variation in the focus and activities across study sites, youth-serving CTCs fulfill important youth development functions. Specifically, these CTCs:

- Provide skills-building opportunities;
- Help youth create social networks within their peer groups, with mentors at the CTC, and with other adults in the community;
- Promote autonomy, leadership, and self-esteem through creative control and storytelling;
- Offer youth an opportunity to engage in community building and advocacy activities.

Methodology

We employed several methods to capture data related to our hypotheses. First, we conducted a broad literature review that encompassed the community technology, community development, youth development, and social capital literatures. We then conducted a focus group with a mix of 12 participants who in different areas of digital divide issues: policy, academic, CTC, education, government and foundation. The purpose of the focus group was to ground truth some of the research findings and also to solicit input about the content of the qualitative component of the research project and the criteria for site selection. For example, the group identified that data should clarify the difference between computer ownership versus usage. For the site selection, the group stressed the importance of looking at CTCs within their community

context, and not as isolated to technology infrastructure, and also provided both specific and general recommendations.

Emerging from this process, we conducted five CTC case studies in the Fall of 2004. For each case study, a team of two or more researchers spent two to three days visiting the CTC. During the visits, we interviewed CTC staff and instructors, youth participants, community partners, and in one case parents. We observed CTC activities, reviewed key program documents, and viewed the products that youth created using technology they learned at the CTC. While conducting interviews with youth of color, we noted that interviewers who shared similar racial and ethnic backgrounds and were closer in age were able to make significant inroads in collecting data, and we utilized these matches as much as possible.

CTCs were selected to meet the following criteria:

- Youth serving—All CTCs had to have an established youth program or serve youth in a meaningful way.
- Minority serving—All CTCs had to serve a minority population, and in most cases youth were economically disadvantaged as well.
- Urban/rural representation—We selected sites to represent a mix of urban and rural areas; four of our five sites are located in more urban areas and one is in a rural area.
- Geographic representation—We selected sites from across the country, including Seattle, California's Central Valley, Los Angeles, New York City, and Lowell, MA (45 miles north of Boston).
- Unique or outstanding program—Each site was recommended to us as outstanding in some way. We sought exemplary programs in order to best identify how CTCs can improve the lives of youth. However, because CTCs were selected in this fashion, results from this study are not necessarily generalizable to the broader population of CTCs.

We also selected sites to represent a diverse cadre of approaches to technology. Toward that end, we included CTCs that focused on: drop-in access and basic skills training, technology training in the context of a broader community center, online journalism, digital video

production, and intensive training for technology careers. Table 1 summarizes the characteristics of these CTCs and each CTC is discussed briefly below.

The *Bresee Foundation*, located in Los Angeles, is a faith-based community center that offers a variety of technology, educational, health, and other supportive services. Youth are a main target group, particularly after school when Bresee offers homework assistance and tutoring. There is a designated youth computer lab where young people have the opportunity to take classes or learn by experimentation with assistance as necessary. High school students have the opportunity to participate in Bresee's Arts and Multimedia Production (AMP) program in which youth learn filmmaking and editing in the process of creating their own social documentaries. Bresee has no entry requirements. Youth participants are from a variety of ethnic backgrounds, including Latino, African-American, Asian, and other immigrant groups.

The *Firebaugh Computer Learning Center* (FCLC) is located in California's Central Valley in a rural town about 40 miles north of Fresno. Firebaugh has a large concentration of Mexican families who are employed in the area's agricultural industry. The FCLC is located in a housing project in which many of these families live. It offers computer access and basic skills courses for adults and youth, as well as opportunities to become involved in community activities and advocacy. There is not a separate youth program, though many young people use the computers for schoolwork. FCLC has no entry requirements and its youth participants are mostly Latino and of Mexican origin.

HarlemLive (HL) is a journalism program that results in the online journal of the same name. Located in a vibrant area of Harlem, the program pulls youth from across New York City to learn journalism and technology skills. HL is a youth-run enterprise, with minimal input from adults. Participating youth undertake great responsibility and hold each other to high standards to

keep the journal production process moving. Participating youth have the opportunity to expand their networks through access to events and celebrities. Although HL is open entry, only self-motivated and productive youth remain in the program. The journal is dominated by African-Americans, but Latino youth participate in the program as well.

Located 45 miles north of Boston, *Lowell Telecommunications Corporation* (LTC) is a community media and technology center that operates public access television, including Youth Channel which is aimed at youth. LTC offers telecommunications services and training to the community for nominal cost, and also pairs extensively with other community organizations. Through LTC's partnership with *United Teen Equality Center* (UTEC), young people had the opportunity to design and produce their own public service announcements on a variety of personally and socially relevant topics, including gang violence, youth unemployment, and sexual activity. LTC and UTEC are both open access facilities that serve youth from a variety of backgrounds, including Asian, African-American and Latino.

Technology Access Foundation (TAF) serves Seattle's minority youth with intensive technology training and internships. Youth participants are screened extensively before selection into the Technical Teens Internship Program (TTIP), where they have the opportunity to use the skills they acquire at TAF in internships with local employers, including Microsoft. Training tracks include network engineering, web development, and programming. The program offers monthly workshops, individual meetings with program staff, college planning, and $1,000 earmarked for college for each year of participation in TAF. Youth participants are all from minority backgrounds, predominantly African-Americans and the children of Asian immigrants.

Table 1 summarizes the characteristics of each of the five CTCs. Three of the five CTCs offer open access computer labs, three offer technical skills training, and three offer multi-media training. All five sites emphasize college preparation for high school students, and three sites offer more formal programs toward that end. Finally, all sites offer the opportunity for adult mentoring, mostly through relationships with CTC staff.

This research suggests the positive effect of CTC participation on youth development. However, our research occurred at one point in time and looked only at youth who participated. Ideally one would like to track CTC participants over time and compare their future educational and employment outcomes to a similar group of young people who did not attend a CTC program. A study of this nature would be enormously helpful to the field of community technology, but is beyond the scope of our current work. Rather, we seek to identify the mechanisms through which CTCs affect youth outcomes as identified by CTC staff and youth themselves.

Why Do Youth Use Technology at CTCs?

If, as statistics suggest, computer access is prevalent and increasing both at home and at school, why do youth need to use computers at CTCs? Reasons for CTC participation are fairly consistent across the five sites we visited and fall into the following themes: Inadequate or no access at home, limited access at school, access to particular types of technology and opportunities to use them at CTCs, employment possibilities associated with CTC participation, and the social environment created at the CTC.

Inadequate access at home. With the exception of HarlemLive, youth at each site reported very limited access to computers at home and the majority of young people we spoke with

reported having no computer in their home.[3] Those with home computers often reported that their computers were sub-standard in that they were old, slow, not connected to the Internet, or lacked updated software or the software that the student was most interested in using. In addition, where computers existed in the home, they were often shared amongst siblings or parents, further limiting access. Particularly for the youth involved in multimedia activities which require specialized software and hardware, home computers were not a viable alternative to CTC use.

Limited access at school. If home access is inadequate, one might expect that schools or libraries to compensate because access at these sites is near universal. Still, there are a number of reasons why young people report preferring CTC use. CTCs tend to be open longer hours and over weekends, allowing young people to use computers and the Internet when their schedule permits. Youth reported that students involved in sports that practice after school rarely have the opportunity to use a school's computer facilities except before or during school, peak user hours with limited computer availability. Many youth we interviewed reported that even when their schools had computer labs, there were too few computers to serve all the students, leading to rationed access in a variety of ways: time limits, computer access only for specific projects, or access only for those enrolled in specific courses. This was particularly the case in schools that CTC staff identified as lower performing.

Further, access may simply be more convenient in a neighborhood center than at school. For instance, some youth who attend the Bresee Foundation in Los Angeles are bused to schools as far as an hour away. Before- and after-school access at school is not possible for them, whereas Bresee is located much closer to their homes. In Firebaugh, which is a much smaller geographic space than Los Angeles, similar barriers are still present. Students have limited transportation options and rely on school buses with set hours to get to and from school. They

[3] The one exception is HarlemLive, where young people did report having computers in their homes.

generally have no way to get back across town to access the school's computer lab for research or homework. FCLC's nearby location is more convenient than the school for many minority youth in Firebaugh.[4]

Access to particular technology. Importantly, youth reported that most of the CTCs we visited have a superior assortment of software and hardware than is available at schools and libraries. They value the knowledgeable staff at CTCs who are available to help answer questions and introduce youth to new programs or technologies. And, in some cases the specialized services offered at the CTC are simply not available elsewhere in the community; four of the five sites we visited offered unique opportunities for young people to interact with technology in engaging ways. These programs are not offered in school or at libraries in these communities.

Opportunities for employment and experience. Youth are attracted to CTCs when the centers offer employment possibilities and when programs offer them experiences that they cannot enjoy elsewhere. Four of the five sites we visited had financial incentives through internships or employment. Although these were not necessarily the main focus of the programs, they operated as effective hooks for getting kids in the door and maintaining their interest.

Analysis Framework

During the course of our fieldwork, we established that CTCs are an effective draw for youth , but, as noted previously, we also found that the lure of these programs extends beyond access and even beyond information technology (IT). We wondered, then, how youth-serving

[4] Although the most rural site we visited, Firebaugh was the only location where staff reported very good computer access at the local high school, perhaps even better than what is available at the CTC. Even so, students could not use the lab at their convenience due to timing and location constraints. In addition, extramural sports are important in Firebaugh, and students involved in sports were severely limited in their access to school computers.

CTCs would fare if we looked at them through the lens of the youth development literature. The National Academies has identified four main areas of personal and social assets that facilitate positive youth development (Eccles & Gootman, 2004):

- *Physical development*—including the importance of health;
- *Intellectual development*—including life skills, vocational skills, critical thinking, decision-making, and an ability to navigate different cultural contexts;
- *Psychological and emotional development*—including positive self-regard, emotional self-regulation, conflict resolution skills, confidence, personal responsibility, and a commitment to good use of time; and
- *Social development*—including connectedness to adults and peers, social integration, attachment to a conventional institution, and commitment to civic engagement.

Individuals need not possess the entire list of assets in order to succeed, but the report concludes that having more of these assets is better than having fewer. CTCs tend not to focus on physical development, but our research suggests that youth-oriented CTCs can contribute a great deal to the other three asset areas. These assets are developed through young people's positive experiences in different settings and with various people. The environments in which these experiences occur also matter and the report identifies eight attributes of settings that promote positive youth development:

- *Physical and psychological safety*—including health promoting and safe peer interactions;
- *Appropriate structure*—including clear rules and expectation, continuity and predictability, and age-appropriate monitoring;
- *Supportive relationships*—including good communication, closeness, support and guidance, and responsiveness;
- *Opportunities to belong*—including inclusion regardless of gender or ethnicity and opportunities for socio-cultural identify formation;
- *Positive social norms*—including expectations of behavior, values and morals;

- *Support for efficacy and mattering*—including practices that support autonomy, offer responsibility, and provide meaningful challenge;
- *Opportunities for skill building*—including exposure to learning experiences, preparation for employment, opportunities to develop social and cultural capital; and
- *Integration of family, school, and community efforts*.

Eccles and Gootman (2004) recommend that community programs that serve youth be based on development frameworks that promote current well-being and positive transitions from adolescence to adulthood. As a group, the CTCs we visited fit very well into this framework. Although not all CTCs embody each attribute, the collective experiences they provide for young people are very much in line with the features one would expect to result in positive youth development. Table 2 aligns the programs we observed in our five case studies with these eight features of youth development organizations; Table 3 illustrates how each of the four outcomes we have identified relates to the asset areas and attributes of settings that promote positive youth development. Some of the strongest areas for this group of community organizations are their safe facilities, supportive relationships, opportunities to belong, support for efficacy and mattering, and opportunities for skill building.

Youth Skills-Building at CTCs

Perhaps the most obvious argument for the supportive role that CTCs can play in young people's lives is that they help to build technical skills that will be critical as youth move into the job market, which is integrally linked to schooling. Evidence suggests that home computers can be important determinants of school enrollment for teenagers (Fairlie, 2005) and also high school graduation (Beltran, Das, & Fairlie, 2005). The clearest overlap between future labor market success and the youth development assets framework is intellectual skills. Learning how to

operate in the information society is key—information plays a different and larger role in the current economy than in previous economic incarnations. In short, information is now both a product of the new economy and an increasingly more important input to production processes. The shift from a manufacturing to a service and information-based economy has had a significant effect on the labor market in terms of entry-level jobs (Wilson, 1987; 1996). First there has been a substantial decrease in the availability of low-skilled, stable manufacturing jobs, shifting away from manufacturing has tended to benefit college-educated professionals and high-end service workers (Kasarda, 1985). Many inner-city residents displaced by structural changes in the economy have found new jobs in the service sector, but these jobs tend to be low wage, unstable, and without benefits. IT has directly exacerbated the "skills mismatch" between higher-end jobs and the low-skilled labor force as technological literacy is added to the skill set needed to join the information economy (Atkinson, 1998).

Employers from a wide range of occupational sectors now view technology literacy as part of the bundle of skills a worker must bring to the workforce. Given the transformation of business practices that information technologies have brought about, universities, banks, hotels, and insurance corporations all need technical support workers, management information systems managers, and system administrators. The demand for workers with these skills is likely to increase as the new mode of production continues to be absorbed and assimilated across institutions and industries (Meares & Sargent, 1999).

The youth-oriented CTCs we studied, to a varying degree, build these skills. Opportunities for skill building are one of the eight attributes of settings that promote positive youth development; most CTCs score high on this attribute. At TAF, for example, participants in the Technical Teens Internship Program (TTIP) receive 180 hours of training over eight months

for each of four years, studying and practicing network engineering, web development, database, and programming. They then compete for paid summer internships at area companies where they apply what they have learned. It is an explicit part of TAF's mission to fill the technology skills gap with people of color. The program seems to be making good strides toward this end: 75 percent of TAF graduates go on to major in college in the Science, Technology, Engineering, and Math (STEM) fields, where minorities have traditionally been under-represented.

Other youth-oriented programs also build technical skills, but with a different approach. At HarlemLive, for example, the entry point for students is journalism, but because the product is an online publication, participants learn skills such as web design and how to post photographs to the Internet. In fact, its website describes HarlemLive as "a journalism, technology, and leadership program" (http://www.harlemlive.com). Part of the appeal of the online journal as opposed to a school newspaper is the former's potential to reach many more people and the fact that an Internet publication holds more allure to young people than a paper product. At LTC/UTEC, youth produce music and television spots and at the Bresee Foundation they create social documentaries. In all of these cases, technology is a medium for self-expression.

As part of their learning process, youth acquire valuable technical skills that are transferable to other areas. At HarlemLive, LTC/UTEC, and Bresee, youth are drawn in for a variety of reasons; they stay because their voices and perspectives are valued, and because they have a great deal of control over what they produce. One participant at LTC/UTEC, for example, told us that "The radio PSA was a way to tackle the tough issues of violence, teenage pregnancy, racism, and prejudice. This [program] was an awesome learning laboratory." In short, these CTCs provide key support for efficacy and mattering, one of the eight attributes of settings that promote positive youth development.

For many youth who participate in these CTCs' programs, technology is the hook that draws them in to the CTC. It is the technology—the allure of learning to do "cool" things with computers or even simply a chance to play video games—that gets them in the door of these programs. Once in the door, however, technology is only a piece of how they benefit. Many of these benefits correspond to the personal and social assets that facilitate positive youth development, according to the National Academies. Specifically, participation in CTCs prepares youth for the world of work, helps them to express themselves in words and pictures, teaches them responsibility, builds their self-esteem, and fosters their critical thinking skills.

Before beginning their summer internships, for example, TAF's TTIP participants receive extensive job readiness training in order to learn how to behave in the workplace, and what it feels like to be the only young person and/or person of color in the office setting. With respect to prioritization and personal responsibility, some poverty theorists have pointed to an inability to defer gratification and to connect present actions to future consequences as factors that contribute to persistent poverty. The work of these CTCs provides strong evidence for the argument that the problem is not a behavioral one, but rather a lack of opportunity, role models, and exposure to different career paths in low-income communities.

Some of the CTCs we studied also create invaluable leadership opportunities for youth. At HarlemLive, youth control virtually the entire organization, including making presentations to potential funders. At UTEC, the organization closely affiliated with LTC, 20 alumnae have part-time employment in the center, managing and operating the media learning and literacy programs. Bresee has also hired a number of its former participants to work in and manage computer labs and programs.

Another important contribution the youth-oriented CTCs we studied make to youth stems from their pedagogical style. The CTCs we studied employ project-oriented learning philosophies and encourage youth to work in groups. These organizations also foster a learner-centered atmosphere to the knowledge they hope to build, and the young people we interviewed contrasted this approach to what they experienced in their schools. Youth solve problems and create products at these centers. This orientation differs markedly from the rote, singular learning style that persists in many school curricula and pedagogy which may not evolve to prepare students for their future workplaces.[5] As a result, the CTCs' approach is much more in line with current workplace demands.

In addition to the technical and non-technical skills that youth-oriented CTCs build, many have also begun to play an active role in helping participants get to college. TAF created its Higher Ed Bound program to serve exactly this purpose. Through this program, TAF helps its 8th graders start to think about what it means to go to college, and works with 9th-12th graders to develop college plans. TAF staff work with both parents and students on entry tests, essays, financial aid, scholarships, and college selection. Although not as formal, other CTCs also discuss college with their participants, arrange for campus visits, and assist youth with the application process. At FCLC, for example, many of the youth learn about the possibility for financial aid from the staff at the FCLC. They are encouraged to apply to college and are shown how to research scholarships online. Bresee's Connections to College program provides SAT preparation courses, and staff help students learn to research colleges on the Internet and fill out applications and financial aid forms.

[5] Technology-focused high schools take this approach a step farther. At New Technology High School in Napa, for example, students must master the eight following skills before they graduate: collaboration, problem-solving, oral communication, written communication, career building, technological literacy, citizenship and ethics, and content literacy.

A large part of what these programs produce is a peer network of youth who are similarly motivated and who provide support to each other as they move from high school to college.[6] Some of the youth participants we interviewed had assumed that they would attend college before participating in the CTC's programs but many others only realized that college was within their reach after beginning to participate. Even for those who wanted to go to college, most had little in the way of assistance. Many are the first in their families to attend colleges, and the high schools they attend tend not to offer much help. For example, Belmont High, the main feeder high school for Bresee participants, employs only one college counselor. This emphasis on college at the CTC is important: in the words of one Bresee youth, "My parents didn't go to college, my sister dropped out. When you're stuck in a hole like that, it's hard to speak up for yourself, and ask."

Although we are unable to use the data we collected to demonstrate an impact of CTC participation on youth education and employment outcomes, we observed a wealth of anecdotal evidence to that effect. Further, many of the youth with whom we spoke were specifically interested in taking advantage of the employment opportunities to which the CTC gave them access. TAF's TTIP connects youth to high level summer internships at which they make $10 per hour and more—well above other opportunities available to them. HarlemLive participants work on web design for local community organizations; half of what they earn goes to HarlemLive, and they get to keep the other half for themselves. In the past, Bresee had funds from the Department of Labor to support documentary making and participants were paid to do that. Money is a powerful motivator for most youth, and this definitely appears to be true in the lower income areas in which we conducted our research.

[6] Other youth-oriented programs such as the Posse Foundation operate on the principal that this kind of support is critical for youth if they are to succeed in the college environment.

Moreover, our conversations with young people indicated that participating in CTC programs helped them to become more aware of their potential and their goals. One young man at Bresee captured it—and the risks of the background environment—with his poignant statement, “I’m a potential lawyer, potential doctor, potential anything. But I’m also a potential failure. But no matter what happens even if I don’t graduate, I’m going to be a better person then I would be without Bresee. I’m not ignorant anymore.”

CTCs as Creators of Social Capital

Dutta-Bergman (2005) notes a curious disjuncture between the study of the digital divide, particularly the role of CTCs, and the study of “social capital.” The curiosity is that the fields would seem to be deeply connected: if there is a real and persistent technological divide, then interventions like community technology centers are meant exactly to provide a shared place for community members to cross that divide, and are themselves a mechanism to connect disenfranchised communities to the larger world.

Are CTCs and social capital indeed connected? Using admittedly simple statistical strategies on a set of survey results, Dutta-Bergman finds a significant correlation between the use of the Internet at a community center and a battery of variables that are typical of the social capital literature and seem to indicate the level of an individual's engagement with broader community dynamics. CTCs, it seems, are not simply another form of social capital but can, in fact, be an important compositional element in the building of social capital.

The literature on social capital and CTCs is thin on explicit theorization regarding the relationship between the construction of social capital and youth who use CTCs. Some research identifies CTCs as an alternative community, and hence set of social networks. Clark (2005), for

example, notes how residents see CTCs as "a place where teens could go," with teens themselves seeing CTCs as a "place to gather and talk with friends" (p. 438). This squares with our own findings, both in the case studies and in a focus group conducted with CTC practitioners prior to the case studies in order to identify relevant questions. In both settings, participants in our research identified CTCs as a safe and nurturing place in often dangerous communities, a location where, for example, the gang presence was not evident and where youth striving to get "off the streets" could find others of like mind.

This role of centers as an alternative gathering spot, however, speaks to only one aspect of social capital. The term, popularized by Robert Putnam (2000) and others, generally refers to the set of relationships, especially of trust and cooperation, that characterize a community. The notion is that this is yet one more asset or form of capital, and can lead to higher levels of social engagement as well as economic and other outcomes; the social capital concept is, for example, frequently tied into the industrial clusters literature in order to explain the economic success of regions as places where firms develop mutually supportive threads of cooperation in the supply chain (Saxeenian, 1996; Benner, 2002). There is also a quite specific set of studies that focus on the application of that concept to poorer communities typical of CTCs (Saegert, Thompson, & Warren, 2001). In this literature, the focus is also on both social efficacy and economic success, especially on the ways in which those social capital connections can be utilized to access internal or external resources to improve financial and civic outcomes for disadvantaged communities (see also Wilson, 1996, Young, 2003).

In this literature on the poor, it becomes especially important to distinguish between "bonding" and "bridging" social capital. Bonding social capital refers to ties within communities that are often "horizontal" in terms of the social status of the individuals in the mutual

relationships. As Briggs (1998) so aptly puts it, such ties help people "get by"—these "bonds" include friends and family that can provide a hand in a pinch, or that can constitute a supportive peer group within the context of larger forces. This sort of "bonding" social capital can be distinguished from "bridging" social capital—that is, ties to individuals who may not be aligned in terms of social status, resources, or geographic location, and who by virtue of that may provide a mechanism and contacts to "get ahead."

Such bonding and bridging connections are crucial for youth development—youth need to find a healthy community that they can feel part of and they need mentors that can provide them access to new opportunities. The mentoring and bridging activities would seem to be especially important for lower-income youth so that they may have connections to broader worlds of work, college, and other matters; for example, in other work, we have shown that the use of external networks to secure employment will likely result in higher wages than if job seekers use only the networks that are rooted in their own communities (Pastor & Robinson, 1996; Pastor & Marcelli, 2000; for a general review of the research on localized networks and job search, see Ioannides and Loury, 2004).

As Granovetter's (1973) study of labor market outcomes has shown, these bridging networks do not need to be strong in terms of deep and long-lasting ties—sometimes "weak ties" work better and what is more important is how the individuals at the other end of the connection are placed in the world. For example, TAF creates these ties with internships. HarlemLive provides youth with connections to politicians and other civic leaders.

Many of the NAS attributes for positive youth development settings fit neatly into this social capital framework. Supportive relationships, opportunities to belong, and positive social norms, for example, all square well with "bonding" or horizontal social capital – all these

attributes refer to the horizontal community to which youth belong (and to which a CTC might contribute). Support for efficacy and mentoring falls a little bit more into the bridging social capital category, although bridges refer to more than that and suggest an aspect of positive development settings missed by the NAS attributes: an opportunity to connect to a world different than one's own. This, it seems to us, is absolutely critical for poor youth – not because they need different values structures, but because they need different opportunity sets. Indeed, while the digital divide is often taken to refer differential access to technology by race or class, the increasing focus on the divide in terms of internet access (or broadband access) suggests that the issue is about unequal exposure to information and to new (virtual) forms of (virtual and otherwise) community-building.

The five CTCs we studied in depth provide a bit of both "bonding" and "bridging" social capital. On the bonding side of things, we found the strongest peer relationships at HarlemLive; this may be no surprise since at HL, the teens themselves were the drivers, with staff playing a more distant albeit supportive role. HL youth actually discipline themselves or rather each other; participants report that when there are problems (e.g., someone not meeting their story deadline) another youth generally confronts the person and they work it out amongst themselves through a mixture of peer pressure and peer support. The youth report that they are attracted to the program because of this high level of self-management as well the fact that HL provides them with a cohort of similarly minded students. Youth also suggest that the experience at HL has taught them to be more "social" – that is, it is building the skills needed for bonding social capital.[7]

The United Teen Equality Center (UTEC) also provides a safe place – it is explicitly located in the downtown area because that is considered to not be anyone's "turf" and hence a

[7] However, as usual, social networks also run the risk of being semi-closed circles – the researcher also report that there was little outreach to immigrant youth, partly because the program cannot afford hand-holding and partly because first-generation youth are not accustomed to the African-American youth culture which dominates at HL.

place where youth of different ethnicities can come together in peace. The LTC/UTEC program provides a frame for youth collaboration on expression, although with a bit less self-determination than HL. TAF also has significant peer-to-peer bonding, with this partly reflecting the "boot camp" nature of the program – because of the time requirements of the program and strict attendance requirements, participants must eschew other bonding activities (such as after-school sports), and intense engagement in this common sacrifice is bound to breed camaraderie. Indeed, students we interviewed reported that the program assisted them in making friends and the ability to be comfortable with new people. One student credits TAF with "giving me a personality," or in other words allowing her a safe place to be herself without concern that others might not like this "personality." This enhanced bonding within each cohort may reflect the selectivity of the program in terms of access.[8]

At Bresee and Firebaugh, the bonds are more oriented around the notion of a safe place to be. Firebaugh is located near the housing project that it serves and provides homework services that create a place to work. However, there is an acknowledgement that supportive coaching is informal; one formal program, an internship team that conducts a technology survey of the local community, is done in collaboration with another workforce development agency. At Bresee, numerous youth indicated this is a location where one could drop in after school and avoid the temptation of street life; it seemed to be especially important for those who took long bus rides from school (given overcrowded schools in the adjoining neighborhood) and therefore had fewer school-based bonds. The fact that Bresee is a classic "drop-in" CTC, with a variety of other activities (including homework clubs and sports activities) made this safe haven function more possible.

[8] TAF staff do report that there were some difference in bonding by ethnicity, with friendships tending to stay with the various ethnic groups that comprise the TAF youth clientele.

Because Bresee has a religious mission, this is also a possible intentional community along those lines as well; yet, Bresee staff are careful to understate this in order to serve a broad public and we found no evidence of proselytizing beyond the simple "example" provided by the staff. Mostly, Bresee has become an alternative community—and that this was not as attractive as other forms of bonding available in the neighborhood (i.e., gangs and other activities) was evidenced by significant concerns by staff and students that attendance dropped off as students made the transition from junior high to high school.

What about "bridging" social capital? Harlem Live is exemplary in the CTC field. Leadership at both institutions explicitly acknowledge the importance of bridges. HL's emphasis on African-American and Latino youth is explained because white students are more likely to be embedded in social networks of family and friends that lead to college preparation, social mobility, and well-paying jobs. The networks that HL can provide are more critical to the population it serves. Indeed, while HL creates its own "bonded" youth community of reporters, an important aspect of the experience was the ability to interview key political and civic figures given the mission on an ongoing "dialogue" with Harlem. HL youth have interviewed President Bill Clinton, Senator Hilary Clinton, Sean "Puffy" Combs, Mayor Michael Bloomberg, Bill Cosby, and others. One former HL student, now a Harvard undergrad, credits HL for giving her "the chance to ask the world some difficult and relevant questions". In short, the reporting also provides a unique set of experiences in cultivating "weak ties"—that is, youth were being given the explicit opportunity and training to do networking (by, for example, making "cold calls" to secure interviews) and HL youth report that the resulting connections have been useful at securing internships and recommendations for college scholarships and admissions. This is classic "bridging" social capital and the training in creating these bridges is reinforced not only

through the reportorial process but also through the HL practice of having youth make all formal and informal presentations to potential funders and partners. Finally, the whole notion of a "dialogue" with Harlem is meant to spur civic engagement, that is, social capital.

LTC/UTEC excels in bridging social capital in general: it is explicitly about networking resources and organizations together. It is less clear how that is designed to benefit or include youth, particularly when compared to HL. We did find some evidence of heightened social and political consciousness among youth as a result of their working on news content and finding their "voice" through Youth Channel activities. There are also efforts to make students aware of college opportunities. Perhaps the strongest bridges are between diverse youth—LTC/UTEC's specific goal for youth is get a diverse group of youth to connect together. While this is important, it is analytically and practically different than connecting to others who may have more social and economic resources.

At TAF, for example, there is an explicit focus on giving youth participants the sort of professional networks often afforded to more advantaged youth. TAF places heavy emphasis on college preparation and adult mentoring. The TAF Alliance is a group of business leaders who have made a commitment to internships for TAF youth or funding for the program, and Alliance members help with mock job interviews. TAF also has direct placements in work settings. The TAF director explicitly talks about TAF as providing an "in" to the business networks that more advantaged youth may get through their families and friends. One unusual advantage of this is that students are placed in a setting where they may be uncomfortable due to dynamics of race, gender, or age—several students reported that they felt less than respected in their new workplaces but did not know whether to attribute that to dynamics of race or youth or simply inexperience. One African-American young man recounted a problem in his internship where his

supervisor called TAF staff instead of speaking with him directly. He stated, “I was left wondering that if I had been White, Asian or anything other than a Black man, if they would have called [TAF staff] or talked to me directly? I just don’t know…But, I really think it was because I am a Black man.” Surely part of the issue was race (judging from the stories told), and running into this early in one's wanderings into the world of employment, particularly in the context of a supportive institution like TAF which provided individual and group support to help him deal with the issue, seems to be good training for tough realities about life in corporate America.

Bresee is less about weak ties and more about strong bridges—youth participants repeatedly identified their relationship with older staff as one of the most enduring gains from their program participation. These bridges were crucial; in the words of one Bresee participant, “Being a kid, you see a wall, and you’re afraid to cross that wall, but to see a person reach, it makes a difference.” Bresee also operates an internship program that places people at workplaces and includes the sort of pre-internship workshops that provide “soft skill” training. It also runs a program designed to expose youth to college possibilities through college tours. One of the most interesting possibilities for bridging is through its Arts and Multimedia Production (AMP) program. However, while this program seems to excel at providing students with an opportunity to tell their story, there is no explicit program for placing students in “the industry.”

This does raise one important aspect of “bridging” social capital—its value is more apparent to youth when it leads directly to employment. Youth, it may come as no surprise, often have short time horizons—social capital and “weak ties” must create visible rewards in order for youth to perceive their value. The CTCs we studied recognize this and build such rewards into their programs.

Autonomy, Leadership and Self-Esteem Through Creative Control and Storytelling

The CTCs we visited actively engage underserved youth in communities where there are not many alternative after-school activities or other technology facilities available. Three of the five sites—HarlemLive, Bresee, and LTC/UTEC—use multimedia to encourage youth to think about their environments and their lives and give them the tools to tell their stories. These CTCs use journalism, social documentary, and video production as their tools, but youth who learn these skills end up absorbing far more than how to edit or produce media. We have found that the processes of creative control and storytelling that are central to these tools promote autonomy, leadership, and self-esteem, which in turn can empower youth to think and act in ways they would previously not have thought possible. These media-related technology programs promote positive youth development, as laid out in the National Academies framework, through the encouragement of autonomy, support for efficacy, and opportunities to belong regardless of cultural or social identification. In this section, we describe the ways that CTCs promote creative control and storytelling among youth and the resulting effects on youth.

HarlemLive, LTC/UTEC and Bresee all promote creative control in that they offer youth full decision-making power in determining what they want to say about themselves, their lives, their communities, their world. The creative control offered by CTCs often contrasts starkly with other aspects of youths' lives. The young people who attend LTC/UTEC and Bresee, in particular, are from disadvantaged backgrounds—they are the children of first generation immigrants, their families are poor, and they contend with gangs and violence in their neighborhoods. Their world is not always within their control. But, at the CTC, they are given an opportunity to tell others what it is like to be them, to live in their neighborhood, to come from

their country of origin, to see their friends go to jail, to be oppressed and live in a country that often excludes them. This process of deciding what story is important to tell and how to tell it, the process of creative control, is empowering. Youth can present their world, offer a message of change or hope, and control how this information is presented and to whom. This creative control is central in promoting autonomy.

For example, HarlemLive's core mission is "to empower a diverse group of youth towards leadership with experience and exposure to media and technology.**"** As mentioned previously, at HL youth run every aspect of the online publication, holding positions such as editor-in-chief, managing editor, photo editor, reporters, layout designers, administrators and technicians. Youth are fully in control of the creative aspects of the magazine, including conducting background research for their own articles, conducting interviews, verifying sources, and covering breaking news—all done with an explicit mission to engage and interact with their community throughout the five boroughs of New York City.

Both LTC/UTEC and Bresee also foster creative control. Youth at LTC/UTEC are responsible for identifying the content and managing the production process from start to finish. Similarly at Bresee, youth who participate in the Arts and Multimedia Program are responsible for creating a social documentary about any topic they select. One young man filmed a trip to his hometown in South America during which he brought children suitcases filled with shoes he had collected in Los Angeles. This film led him to create a non-profit agency that continues to collect and deliver shoes to children in South America.

The second half to creative control is storytelling, which is also a central aspect of empowering youth through technology. Creative control means that youth tell their own stories, from whatever angle they think is best. As an emerging field, digital storytelling links various

multimedia software application and web-enabled technologies to document important events, communicate a message and encourage people to share their stories. Storytelling is a way to communicate pride in one's heritage and traditions while bolstering cultural resistance to mainstream media's misrepresentation and distortion of youth and their respective community and its core values thereby supporting youth culture. Centrally, race, class, ethnicity and gender inform youth perspectives about the relative importance of storytelling at the CTCs we visited. Youth narratives are often about current experiences, overcoming obstacles, and fighting negative images. At their core, youth narratives are about family history and engendering self-esteem. Hence, the power of storytelling lies in "organizing to create empathy and build relationships between different people and communities by connecting both the storyteller and the listener in a common narrative" (Third World Majority, 2002).

The voice youth are able to achieve through digital storytelling is very different from what is expected at school, at home, and in the workplace. Janet Murray asks, "How can we make this powerful new medium for multiform narrative as expressive of the writer's voice as is the printed page?" (Murray, 2005). In reply, CTCs through digital storytelling, blogging, chat rooms, on-line radio programming, filmmaking, and even more traditional mediums such as public service announcements, have democratized who speaks and from what vantage point.

The youth-serving CTCs we studied enable youth "to push the boundaries of cultural acceptance, and whenever they come into contact with new tools, some amazing new solutions to old problems are bound to evolve" (Hitchcock, 1997). One young woman from LTC/UTEC reported that her involvement in creating a public service announcement helped her to gain an important voice in her community: "UTEC has really been a great place for me…I came here

and got involved with women's activism….I can tell girls to make sure they're having protected sex and not to letting their man beat on them."

Each of CTCs we visited engages in storytelling through a multitude of forms and to varying degrees through the many ways youth use and appropriating computers and Internet to developing an engaging youth culture. HarlemLive is the most extreme example of storytelling because as a magazine, it is entirely about youth sharing information from their perspective. Youth are attracted and remain engaged because HL is a place where their voices have power. In addition, the online distribution amplifies their voices. As mentioned previously, Bresee and LTC/UTEC also promote storytelling through filmmaking and public service announcements where the voices of disenfranchised youth are given power and amplification. Indeed, the use of digital technology allows new ways for youth of color, who are often absent from discussions about world and even local public policy issues, to question the authority of institutions that continue to marginalize and disappear both their voice and significance in society (Sefton-Green, 1998). A former participant at Bresee voiced this same sentiment, stating "Bresee has given me a way to show my story to other people, give them knowledge of a different way of thinking, viewing the world, view indigenous people." Although this young woman claimed to not be naturally inclined toward higher education, the experience of telling the story of her people made her realize that college is imperative for her success, and she was in college when we interviewed her.

The five CTCs we visited promote autonomy in other ways as well. Most notably, the CTCs do not actively engage the parents of the youth they serve, and in most cases do not work directly with their teachers or school counselors. Of course, where problems arise or parents express interest or concern, staff may individually speak with relevant adults. But, in the vast

majority of cases, youth who participate in these CTC programs do so as individuals, not as sons, daughters, or students. CTCs in these communities offer support and guidance for youth and also help them prepare for work opportunities. In particular, youth become responsible for their conduct, dress, completion of their projects, and obligations to others with whom they work. For many this is their first "real world" experience with autonomy, and some of the CTCs offer guidance to help. For instance, at TAF students participate in monthly leadership workshops and give oral presentations to hone their public speaking skills. At LTC/UTEC, youth can become peer mentors who take a leading role in collaborating with an adult staff member to help new youth participate and access services available at UTEC.

The first "C" in CTC: CTCs as Community Members

We have described the ways that CTCs in our study provide services to youth, help them to gain a "voice", and provide them with opportunities and connections they may not have otherwise had. In this section we concentrate on the ways that CTCs act as neighborhood or community resources, a particularly important role in the disadvantaged communities we visited. The way that CTCs fit into and interact with their communities can be important in helping them promote positive youth development. The National Academies framework discussed earlier in the paper maintains that providing physical and psychological safety, opportunities to belong, and integration with the broader community are key attributes of youth development promoting organizations. In this section we discuss the ways that our five CTCs integrate into their communities to provide youth with these positive attributes.

Our research shows that CTCs can be key actors in their broader communities, taking on roles far beyond their primary function as provider of technology access and services. Leaders at the CTCs we visited wear many hats, including community builder, advocate, and developer.

Their activities stretch outside the confines of their centers to include civic engagement and community empowerment, with a technology agenda often as a means to those ends. Furthermore, the centers themselves are located geographically to act as hubs of civic life in areas that generally lack such institutions.

CTCs reach their surrounding communities and offer leadership to the community as a whole in three general ways: (a) by situating in locations that are easily accessible to community members and becoming part of that community; (b) through community-building activities that are promoted by CTC staff, CTC participants have the opportunity to become more civically engaged; and (c) by promoting other important agendas (e.g., health care access) or offer supportive services to community members to assist them in pursuing technology training. By virtue of being part of the community, they provide an environment where youth are comfortable and belong.

Neighborhood Placement of CTCs

CTCs have been described as anchors in the communities they serve, especially the disadvantaged communities we visited (Davies et al., 2003). Their placement in these neighborhoods is important for a number of reasons. First, safety is critically important in the neighborhoods we visited, and is also an NAS attribute. The CTCs visited reaffirmed the basic necessities of physical safety, familiarity, proximity, and accessibility. All spaces were safe, with adults in place to monitor activities and ensure that certain types of behaviors (e.g., gang-related, violent) were not present. At UTEC, youth developed their own teen center in response to gang violence that plagued the area. The CTC's loft-like space is conducive to youth finding their way to those activities that are most interesting to them. To encourage a safe environment, some

CTCs even require a dress code. Students who attend TAF and Bresee must comply with certain standards of dress that preclude gang-related clothing, clothing that is revealing, and in the case of TAF, hats. These attempts to create physically safe environments are critical in order for CTCs to draw in youth from the neighborhood.

A second attribute is the physical location in neighborhoods served. The five CTCs we visited were located in neighborhoods that have schools and libraries which lack the ability to provide the level of technology access and services as available through these other institutions. In some cases, such as at LTC, Bresee, and TAF, the neighboring schools simply offered inadequate computer resources for students. Those wishing more in-depth instruction or sometimes even relatively basic photo-editing or music software were forced to look elsewhere for these technologies. In order for youth to be able to take part in the variety of activities offered by CTCs—including homework help, advanced training, internships—the CTCs ideally are located in close proximity to their homes.

This was of critical importance in two sites we visited: Bresee and FCLC. More than any other CTC we visited, Bresee is fully integrated into its community, a likely result of the presence of the church in the area for many years prior to the opening of the CTC. Still, staff at the Bresee CTC were aware of the important role they had in the community. Several white staff with whom we spoke had chosen to live in the neighborhood surrounding Bresee, an area which is almost entirely people of color, mostly Latino immigrants. In the view of these staff, this helped them better bridge the potential ethnic gap with the youth they served: they were able to see the youth and their parents at the local grocery store and in the halls of their apartment buildings. Our impression talking to the youth was that this was crucial: where the staff lived mattered more to kids than staff ethnic backgrounds, a powerful statement about the importance

of community in an ethnically-diverse neighborhood. One Bresee student stated, "…people here seem like friends, not grown ups," which is a high accolade from a teenager.

Firebaugh is a geographically and socially isolated agricultural community; the Center aims to be open as many hours as possible and at convenient times. At FCLC, the local high school was not lacking in computer technology, and in fact had as good or better computers than the center. However, the high school is located on the other side of town from the housing complex in which the CTC is situated, and where many Latin American immigrants live. Many of the families do not have reliable transportation and with no school bus to bring them back to school to do homework, many of the students simply have one option for computer use—their local CTC. Its presence in the housing authority complex is critical to serving its community. At both Bresee and FCLC, most of the participants live in or near the neighborhood. Many said they were brought there by a friend or for homework or other computer help. The youth liked coming to the CTCs because they were closer to their homes than schools, libraries or other points of computer access.

Community Building and Civic Engagement

In a practical sense, computers and the Internet assist community members to share information about education, safety, jobs, and community events. Moreover, sharing a collective community history, or the personal histories that comprise this, is empowering in that communities can use these histories to change or improve their surroundings and activate their communities (Breeden et al., 1998). While research has shown that in at least one low-income community, the presence of a CTC was associated with greater awareness of community resources and knowledge about local activities and events (Pinkett, 2001), a comprehensive study of the community technology movement suggests that it is not fully aligned with the

community building movement, which has the broad mission of revitalizing distressed communities (Davies et al., 2003, Kirschenbaum & Kunamneni, 2001). However, some of the CTCs we visited are also attempting to link these parallel trajectories, combining technology services with community building.

Increasingly, CTCs are seen as vehicles for revitalizing disconnected communities and because the CTCs we visited were located in disadvantaged communities, they have the potential to help local residents engage in community building.[9] All the sites visited serve youth beyond technology access, to varying degrees, extending into other areas of need and interest. In some cases these areas provided the building blocks for civic engagement. Several of the CTCs offered explicit or implicit leadership development exercises, such as public speaking, presentations, and community based research—skills that promote future civic participation. For example, at TAF, students participated in leadership seminars; HarlemLive students *are* the leadership and through their journalistic work have created a strong community identity there. HL youth are especially engaged in community-building due to the nature of their work. They encourage accountability in their schools, political districts and neighborhoods—a form of civic engagement that may be an unintended but important byproduct of their journalism efforts.

Programs at both LTC/UTEC and Bresee support youth creative control and autonomy through social awareness and community organizing. At LTC/UTEC, for instance, youth produce public service announcements about a variety of important community-related topics, including police harassment, youth violence, teenage pregnancy, HIV/AIDS and other sexually transmitted diseases. LTC youth are also civically engaged through their production of public service announcements. They identified the areas of need in their communities and addressed

[9] Reflecting this trend toward seeing CTC in a broad context,, the 2005 Annual CTCNet Conference was titled: *Making Connections, Strengthening Communities* and included sessions on the ability of CTCs to transform communities through enhanced participation of all ages.

and framed community issues such as AIDS, teen pregnancy and violence. The Youth Channel exposes the community to different youth opinions and alternatives to mainstream ideas about Lowell and the issues that matter to youth. At the FCLC, a leadership group was formed called Grupo Unido en Acción, whose focus was community organizing. While it was primarily an adult group, the group discusses and acts on issues that affect the larger community, including employment challenges, outreach, and communicating with local government.

Credibility in the neighborhood is a key element for CTCs, for the youth, and for families and the larger community. Leadership that reflects the community, is representative, and is culturally competent is considered important by the staff at the sites. Knowing the community, understanding the needs, concerns, assets and desires of the families are necessary for fully engaging youth. According to the Executive Director of the FCLC, who is a fellow at the Community Technology Foundation of California and herself a model of an engaged citizen, "successful programming is driven by the community."

Centers assess skills and education to develop programming but to do so effectively they must also understand the social context in which they are providing services/education. CTCs do this by knowing the interests and needs of their population and adjusting their programming accordingly. For instance, at FCLC the internship project begins with a neighborhood survey on the household technology capacity. This serves the purpose of skill building for the youth to complete and analyze a survey, the results are collected by local youth which will be non-threatening in an area with many undocumented residents who may be hesitant to respond, and it also helps the Center have up to date information knowing about household computer access. Our research has identified that technology is a means to an end, with one end goal being empowerment of community members. One way that CTCs can enhance the quality of lives of

youth is by promoting community ownership, identity and empowerment. The vision goes beyond training and access, to transforming individuals whose world views then grow and may lead to change in the larger community.

Partnerships and Supportive Services

Although some CTCs are stand-alone centers, many rely on partnerships among various community entities and some are even large networks with 30 or more sites (Davies et al., 2003). Partnerships are often needed for building organizational capacity, such as offering job training or health care, and linking with different parts of the community. Working with allies in the schools, churches, and other organizations is important for both comprehensive service provision and community organizing. Many of the CTCs we visited have well established partnerships: HarlemLive works with Public Allies, a NYC agency that places youth in leadership positions to strengthen commitments to public service. Bresee is affiliated with its founding church and its extensive network. FCLC works with VISTA, the Housing Authority, the Central Valley Digital Network of the Great Valley Center of Fresno, the Migrant Education program, the Adult School, and others. The TAF Alliance is a group of business leaders that commit internships, funding or both to the CTC. At LTC, partnerships are a core part of their model—they coordinate and lead the 23 member LTC Consortium which provides a dense network of prominent local and regional actors. Having buy-in and assistance from the larger community greatly assists the various programs.

These partnerships often provide participants with additional services or opportunities that facilitate or enhance CTC participation. Supportive services such as child care, health care, counseling and transportation are also sometimes provided by the CTCs themselves. Sometimes

the services are informal in nature, like counseling a young person about being the first person in the family to go to college, but this kind of support may be the most valuable for allowing youth to take full advantage of what the CTC offers. Since CTCs are often viewed as a central resource to a neighborhood, community members will come to the site bringing all their interests and questions. When possible, supportive services are provided on site (e.g., health care services at Bresee), however commonly knowledgeable staff give referrals for other services that are housed in other agencies or community partners. Due to the multiple demands on community centers and the reduced resources available, this type of coordination and sharing of information is increasingly necessary.

Summary and Conclusions

Our study applies the National Academies assets framework (Eccles & Gootman, 2004) for guidance on measuring or comparing youth development programs, and the personal or social assets that will facilitate positive youth development. Using the framework, our study of five community technology centers (CTCs) nationwide provides evidence that CTCs can be excellent locations for promoting positive youth development. Although each CTC individually does not possess all of the characteristics laid out by the National Academies, as a whole this group of acclaimed CTCs provide youth with settings and tools that appear to help minority and disadvantaged youth acquire skills and empower them to think differently about their own futures, their communities, and the prospects for success in both.

Our study highlights four ways that youth participating in CTC programs gain from these experiences. First, as is critical in the information age, they gain skills that are increasingly required to obtain even entry-level jobs. Participants at CTCs learn skills that range from the

most basic (e.g., how to turn on a computer or search the Internet) to very advanced (e.g., network engineering or digital film and music editing), and all that is in between. Youth come in to these centers to gain this knowledge. They stay because their work and perspectives are valued and their voices are both heard and respected. Our study has demonstrated that participation in CTCs prepares youth for the world of work, helps them to express themselves in words and pictures, teaches them responsibility, builds their self-esteem, and fosters their critical thinking skills, all NAS attributes associated with positive development.

Our second main finding is that CTCs support the creation of social capital for youth participants in two main ways: through the formation of bonding networks (i.e., with one's own peers at the CTC) and bridging networks (i.e., with others in the community who have higher social standing and therefore different social networks). Such bonding and bridging connections are crucial for youth development—they provide youth with a healthy and welcoming community and mentors that can open them up to new opportunities. The mentoring and bridging activities are particularly important to the youth who attended the five CTCs we visited, as they offered connections to employment, college, and other networks with which they might not have otherwise been able to connect.

Third, we find that youth use their acquired technology skills to give voice to their realities, through written word, film, public access television, music, art, and in other ways. The simple act of telling their story is empowering because it allows these youth, who often see misrepresenting media images of themselves, to identify what they view as important in their communities and portray it in a way that is real to them. The processes of creative control and storytelling are used by CTCs to breed autonomy, leadership, and self-esteem, empowering youth to think and act in ways they would not previously have thought possible.

Finally, we find that CTCs play a critical role in the community by offering opportunities to connect to the outside world through technology and social networks, but also by actively encouraging and supporting civic engagement and community development. CTCs are located geographically to act as neighborhood centers, acting as hubs of civic life in areas that generally lack such institutions. This positions them to promote community-building activities in which CTC participants have the opportunity to become more civically engaged. And, by offering supportive services and referrals or information for additional services, CTCs can promote other important agendas (e.g., health care access) to assist them in pursuing technology training.

These four sets of findings are highly interrelated. Skills-building activities affect youth directly—through the acquisition of important workplace skills – and indirectly – through the empowerment and self-esteem that stem from the application of these skills. CTCs promote the integration of disadvantaged or disenfranchised youth into broader social and community networks and at the same time position themselves as community hubs and resource providers. CTCs in our study have been able to link skills mastery with the creation of social capital in ways that offer youth an opportunity to take their newly acquired empowerment and use it to improve their lives and their communities.

What does all this suggest for theory, policy and practice? We would stress two things. The first is straightforward: both analysts and program developers would do well to be more explicit about wedding the concepts of social capital and youth development in the CTC field. It seems clear to us that youth development, particularly for youth in disadvantaged communities, is exactly about social capital—about providing supportive peer networks and connections to other worlds of opportunities. It is also clear that the digital divide is a concept about not simply technology but social distance—that is, that we worry about unequal access to technology not

merely because of the power that technology has to enhance individual development but because of the way in which Internet access, the increasing focus of digital divide researchers, has to overcome the isolation of individuals and communities. CTCs are a community-based intervention to overcome that isolation—by nature, they are about building "bonding" and "bridging" social capital. Being more explicit about this in both analysis and practice could lead to a clearer understanding of roles, and perhaps better programs.

This can be seen in our second major point: programs need to provide the bridges aspect of social capital in more intentional ways. The programs we visited varied in the degree and type of bonding, but all the programs were quite clear about this role for youth in terms of providing a safe space and/or opportunities for working together. Where they varied most was in the type and effectiveness of their bridges, at least in terms of connections to future opportunities. This is truly a long-lasting impact of CTCs. Moreover, to the extent that it is combined with strong bonds – so that individuals do not view CTCs as an opportunity to "get out" but rather to "get ahead" and perhaps return to help other youth, that would seem to be a good thing. Many of the CTC directors are very clear about this bridging role and we would suggest that this seems good—again, after all, crossing the digital divide is itself all about bridges.

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Table 1
Characteristics of Case Study CTCs

	Bresee Foundation	**Firebaugh Computer Learning Center**	**HarlemLive**	**Lowell Telecommunications Corporation**	**Technology Access Foundation**
Location	Los Angeles, CA	Central Valley, CA	Harlem, NYC	Lowell, MA	Seattle, WA
Goals	Provide access to technological resources often out of reach to low-income community members, teach marketable skills, and enhance job placement opportunities.	Provide social, economic and educational advancement opportunities through technology training and programs.	Web magazine journalism program that teaches young people how to run an online newspaper. Includes journalism, technical, and video production/photography tracks.	Provides opportunities for people to become content providers from various production platforms. Uses state of the art training and access to video and computer equipment at low or no cost, as a forum for free speech.	Provides intensive skills-building activities and internships to minority youth in order to diversify technology occupations and encourage students to attend college.
Public Access	Yes	Yes	No	Yes	No
Multi-media	Yes	No	Yes	Yes	No
Homework help	Yes	Yes	No	No	No
Basic computer skills	Yes	Yes	No	Yes	No
Technical skills	Yes	No	Yes	Yes	Yes
Internships/employment	Yes	No	Yes	Yes	Yes
Informal College Prep	Yes	Yes	Yes	Yes	Yes
Formal College Prep	Yes	No	No	No	Yes
Adult mentors	Yes	Yes	Yes	Yes	Yes

Table 2

Case Study CTCs and Features of Positive Developmental Settings

	Bresee Foundation	**Firebaugh Computer Learning Center**	**HarlemLive**	**Lowell Telecommunications Corporation**	**Technology Access Foundation**
Physical and psychological safety	Facilities are safe, secure, and health-promoting	Facilities are safe	Facilities are safe; youth often spend much of their out of school time there	Safe and secure facilities that promote a range of types of positive peer group interactions	Facilities are safe and secure
Appropriate structure	Continuity and predictability, but not enforceable structure or monitoring	Mostly unstructured access	Structure is not completely clear; enforcement comes largely from peer pressure and expectations	Continuity and predictability; age-appropriate monitoring	Very structured, clear rules, expectations, boundaries, and predictability
Supportive relationships	Very strong and supportive relationships between teens and staff, less so between teens	Mentoring relationship between key staff person and select teens	Relationships among teens, and between teens and staff, is extremely supportive	Very strong and supportive relationships among teens, and between teens and staff	The intensity of this program coupled with the caring of the staff foster very supportive relationships
Opportunities to belong	Program is inclusive and centered around a neighborhood concept of identity	Center is very focused on creating a place where youth feel they belong, within their immediate and the larger community	Program creates a space for youth of color to belong, and to focus on issues that they define as important	Focus is very much on youth having a place where they belong; many opportunities for sociocultural identity formation	Focus on youth of color provides an opportunity for meaningful inclusion

Table 2 (Continued)

	Bresee Foundation	**Firebaugh Computer Learning Center**	**HarlemLive**	**Lowell Telecommunications Corporation**	**Technology Access Foundation**
Positive social norms	Clear expectations on appropriate behavior stemming from religious connection, emphasis on homework completion, less emphasis on obligations for attendance	Emphasis on homework completion; less emphasis on values, morals, and service obligations	The online journal product lends itself well to the creation of clear expectations and ways of doing things; less emphasis on values, morals, and obligations for service	Expectations are clear; not a high emphasis on values and morals	Lays out very specific rules of behavior and norms; the consequences of not following the rules are also very clear
Support for efficacy and mattering	Programs emphasize youth empowerment and community involvement, particularly digital media project	Center actively engaged in community advocacy and youth encouraged to participate	Journal work enables youth to produce a product that can make a difference; youth work autonomously and are appropriately challenged	Programs are very connected to the community; Youth are challenged appropriately; practices focus on improvement	Internship program grants responsibility and provides meaningful challenges; "bosses" and teachers are effective mentors
Opportunities for skill building	Programs emphasize intellectual and technical skills building, and also opportunities to develop social and cultural capital	Center emphasizes exposure to technology through hands on experience and limited courses	Youth build skills in writing and technology, as well as interpersonally as they create the journal together	Programs promote intellectual and social skills; builds cultural literacy and media literacy; develops social and cultural capital	Internship program builds concrete technical skills, prepares teens for adult employment, and builds cultural literacy
Integration of family, school, and community efforts	Program integrated into community and to a lesser extent family, but not school	Program integrated into family, community and, to a lesser extent, school	Program not really integrated into family, school; journal is important community product	Program's partnerships with other community organizations function as a media outlet and connect it to community	Internship program connects kids to business community

Table 3

Connection between Outcomes of Youth-Serving CTCs and Youth Development

Outcome	**Primary Asset Area Built**	**Attribute of settings that promote positive youth development**
Skill Building	Intellectual development	Opportunities for skill building; supportive relationships
Social Capital	Social development	Opportunities to belong; supportive relationships; positive social norms; opportunities for skill building; support for efficacy and mentoring
Storytelling	Psychological and emotional development; intellectual development	Opportunities for skill building; support for efficacy and mattering; opportunities to belong
Community Building/Advocacy	Social development	Integration of family, school, and community efforts; physical and psychological safety; opportunities to belong