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The Role of Community Technology Centers in Promoting Youth Development

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Abstract

Recent data suggest that the digital divide between White and minority youth persists, particularly in terms of home access to computers and the Internet. Community technology centers (CTCs) are an important alterative access point, especially for low-income youth of color. Such institutions, however, do much more, providing not just access, but general youth development, including the opportunity for youth to voice their stories, contribute to community-building, and expand networks. The authors use qualitative data collected at five CTCs nationwide to examine the ways that youth engage in CTCs and link these activities to a youth development framework. The authors draw lessons for future CTC practice, highlighting the importance of both bonding and bridging social capital in thinking through future programming.

Keywords

digital divide, community technology center, youth development

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Disparities in computer and Internet access among those who are low-income, African American, or Latino have been well documented (Day, Janus, & Davis, 2005; Fairlie, 2007). As tech-savvy young people lead the rest of society into a fully wired and mobile nation (Lenhart, Madden, & Hitlin, 2005), the most disadvantaged youth still have less access to computers and the Internet, particularly at home. Stepping in to help reduce digital disparities are government programs, such as the E-rate program, which has assisted the purchase of computers by public schools and libraries. More locally, community centers or community technology centers located in low-income and minority neighborhoods offer access and, in some cases specialized training, to people of all ages who lack home computers and Internet.[1]

The literature on computer and Internet use has focused primarily on technology access at home and school and largely concludes that computer and Internet access help young people succeed academically (Fairlie, Beltran, and Das 2009; Fairlie, 2005; Fowells & Lazarus, 2001) and in the labor market (Chapple, 2006; Lazarus & Wainer, 2005). Access is even associated with reduced crime and teen pregnancy (Fairlie et al., 2009).[2] Virtually none of the existing literature considers the broader impact of technology access on positive youth development outcomes, such as youth voice, civic engagement, and social capital.

This study started as an open-ended exploration of the ways that technology-focused programs affect youth beyond simple access to computers and the Internet. The findings are striking in that our observations and interviews at five community technology centers (CTCs) nationwide generated overwhelming evidence that technology is inherently linked to positive youth development. With the primary goal of promoting technology skills, the centers we visited end up doing much more; they help youth find their own positive developmental path.

The first CTC—Harlem's Playing to Win—was founded in 1983 by Antonia Stone and simply offered basic computer access to the general public. Today, CTCs offer a diverse array of technology-related and other services in urban and rural communities nationwide; many of the technological applications offered cannot be found in other public domains, such as libraries and schools (Mark, Cornebise, & Wahl, 1997). CTCs are located in housing projects, community centers, storefronts; some are embedded within larger organizations and others are stand-alone centers. Services offered at CTCs range from access and basic skills training to highly 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 camaraderie they share with other

young people and adults while at the CTC. CTCs can also play an important role in the community, offering other neighborhood services, such as social services, and community advocacy and organizing (Davis, Pinkett, Servon, & Wiley-Schwartz, 2003; Pinkett, 2003; Pinkett & O'Bryant, 2002; Servon, 2002).

In this article we focus on adolescents, particularly high school youth. We examine CTCs as a point of access in an attempt to understand how young people experience the technology offered at CTCs and the role CTCs play in disadvantaged communities. We use case studies of five CTCs nationwide to argue that, despite tremendous variation in the focus and activities across study sites, youth-serving CTCs give youth valuable experience with technology they may not otherwise experience. However, they tend to do much more: In the process, these CTCs provide skill-building opportunities; help youth create social capital through 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; and offer youth an opportunity to become civically engaged through community involvement and advocacy opportunities.

Linking Technology and Youth Development

At the onset of this project, we convened a group of 12 experts involved at different levels in the digital divide debate—policy, academic, CTC, education, government, and foundation—to solicit input about the content of the research project and design. The group strongly identified a need to better understand what, beyond technology skills, youth gain from their participation in technology-focused programming and how this translates into long-term positive outcomes. They recommended that research needs to establish qualitative indicators for understanding the many aspects of youth transformation seen as vital to understanding the effectiveness of CTC programming. In essence, these leaders asked us to reframe the discussion of technology and youth in ways that reach beyond access to computers and computer skills. They asked, in short, for us to fuse the literature on community technology with a youth development framework to help technology professionals and program operators understand the power of technology to promote youth outcomes that are seemingly unrelated to technology itself.

The field of youth development is more mature than the more emergent field of community technology. Summarizing the most important works in out of school youth development practices, the National Research Council (NRC) identified four main areas of personal and social assets that facilitate

positive youth development (Eccles & Gootman, 2002): (1) physical development, (2) intellectual development, (3) psychological and emotional development, and (4) social development. The environments in which these experiences occur also matter and the report identifies eight attributes of settings that promote positive youth development: (1) physical and psychological safety, (2) appropriate structure, (3) supportive relationships, (4) opportunities to belong and for sociocultural identity formation, (5) positive social norms, (6) support for efficacy and mattering, (7) opportunities for skill building, and (8) integration of family, school, and community efforts. We used these attributes to help us assess the work of the CTCs we studied and found that, as a group, the CTCs we visited fit very well into this framework. Although not all of the CTCs embodied 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.

In this article, we focus specifically on four ways that CTC programming promotes youth development in intentional and unintentional ways: technology skills building, relationship building, youth voice, and civic engagement. The first of these outcomes, skills building, is perhaps the most understandable reason youth, especially youth from disadvantaged communities, would participate in a technology-focused program. Learning how to operate in the information society is key to future success, particularly since the shift from a manufacturing to a service and information-based economy has had a significant effect on entry-level jobs (Kasarda, 1985; Wilson, 1987, 1996). 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, and technology 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 (Meares & Sargent, 1999). Especially for youth in low-income communities, labor market success will depend on an ability to use, adapt, and transfer technology- and knowledge-based skills (Harris, 2005). Although youth employment and youth development are not traditionally linked, there has been recent attention to the importance of connecting these approaches to best serve youth (Cochran & Ferrari, 2008).

Yet enhanced skills alone may not be sufficient to improve youth outcomes if youth are unable to parlay their skills into employment opportunities. Relationships with adults and peers and creating networks—or social capital—are critical steps for putting what youth learn at CTCs into action. The term

social capital, 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 asset or form of capital can lead to higher levels of social engagement as well as economic and other outcomes.

The link between social capital and improved youth outcomes is established, as researchers have concluded that improving social capital for youth can build more resilient families (Terrion, 2006) and help disadvantaged youth find successful paths out of disadvantage (Furstenberg & Hughes, 1995). The relationships that comprise social capital for youth provide access to information, assistance, support, and encouragement, which are particularly important for young people who are otherwise disconnected (Jarrett, Sullivan, & Watkins, 2005).

Dutta-Bergman (2005) noted the link between the digital divide and social capital: If there is a real and persistent technological divide, then interventions like CTCs 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. Using admittedly simple statistical strategies, Dutta-Bergman finds a significant positive correlation between Internet use at a community center and a battery of variables that proxy the level of an individual's engagement with broader community dynamics. CTCs are a potentially important compositional element in the building of social capital. Clark (2005) specifically identified CTCs as a place offering a set of social networks, noting that 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 role of centers as an alternative gathering spot, however, speaks to only one aspect of social capital. Another set of studies focuses on the application of that concept to poorer communities typical of the CTCs we visited (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 vein, it is 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. 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 (Briggs, 1998). Bonding social capital can be distinguished from bridging social capital—which exists across communities

or groups and consists of weak ties that help people "get ahead," by connecting them to people outside of their immediate network (Granovetter, 1973). Research, shows, for example, that wages are higher if job seekers can use networks beyond those rooted in their own communities (Pastor & Adams, 1996; Pastor & Marcelli, 2000). As Granovetter's 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.

A third and perhaps most compelling area where technology and youth development overlap is through youth voice. McLaughlin, Irby, and Langman (1994) argued that successful neighborhood organizations engage adolescents in ways that give them ownership of the program or their role in it; they do more than just provide opportunities for youth engagement—they operate through youth engagement. Youth voice is not merely about having students share what is wrong with their school and ways to improve these (Fielding, 2001). Rather, meaningful student voice can create developmental experiences that—in addition to improving practical skills like public speaking—promote youth agency, help youth gain skills to transform the institutions in which they are set, and create bonding and bridging networks in the process (Mitra, 2004). After-school programs may create even better opportunities for promoting youth voice, and along the way, also promote other development outcomes including bonding and bridging social capital, leadership, and civic engagement (Strobel & Nelson, 2007).

With the emerging field of digital storytelling—which links various multimedia software application and Web-enabled technologies to document important events, communicate a message and encourage people to share their stories—youth voices have a new way to be heard. 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. Ethnicity, class, and gender inform youth perspectives; youth narratives are often about current experiences, overcoming obstacles, and fighting negative images (Third World Majority, 2005). Storytelling can thus validate identity and empower youth to be more successful.

A final area for the intersection of youth development and technology concerns the possibilities for increased community involvement for youth. Civic engagement is an important element of youth development (Flanagan & Faison, 2001) and youth advocates actively promote youth civic engagement as a way of building local leadership for the future (Irby, Ferber, & Pittman, 2001). However, research indicates a steady decline in youth civic

engagement over the past 30 years (Carpini, 2000). Participating in community clubs or teams is associated with a greater propensity for community service among youth, but more advantaged youth have far greater rates of participation in these activities (Hart, Atkins, & Ford, 1998). This divide in civic participation mirrors the digital divide, with minority and low-income youth becoming multiply disadvantaged in civic societies that increasingly rely on technology for civic participation (Norris, 2001). On the other hand, given the easier access to public discourse and opportunities for participation afforded by the Internet, access to technology can enhance the ability of youth to engage in a civic society in new and unpredictable ways (Carpini, 2000; Larson, 2002).

A growing body of literature connects IT-related programming with civic engagement for youth. One study in a low-income community indicates that the presence of a CTC was associated with greater awareness of community resources and knowledge about local activities and events (Pinkett, 2003). Taking photos of their environments in the context of an after-school program can also spur adolescents into social action, using the media to create dialogue and action plans (Wilson, Martin, Wallerstein, Wang, & Minkler, 2007). A comprehensive study of the community technology movement suggests that it is not fully aligned with the community building movement (Davis et al., 2003; Kirschenbaum & Kunamneni, 2001). Sharing the personal histories that comprise a broader community history—a key programmatic strategy used in the CTC programs we studied—can empower communities activate in order to change or improve their surroundings (Breeden, Cisler, Guilfoy, Roberts, & Stone, 1998).

Research Method

We conducted five CTC case studies in the fall of 2004. The sites we chose emerged from a range of exemplary programs offered by the focus group of CTC leaders discussed previously and snowball techniques. From the available list, we developed three basic criteria. First, all CTCs had to have an established youth program or serve youth in a meaningful way. We focused specifically on programs serving high school youth, though some CTCs served youth in multiple age groups. Second, CTCs had to serve a minority population, and in most cases youth were economically disadvantaged as well. Third, we selected sites to represent a range of locational contexts; four of the five sites are located in more urban areas (Seattle, Los Angeles, New York City, and Lowell, MA [45 miles north of Boston]) and one is in a rural area (California's Central Valley). Because CTCs were selected in this fashion

and also because all were exemplary programs recommended by our expert panel or their contacts, results from this study are not necessarily generalizable to the broader population of CTCs.

Ultimately, the sites we studied also employed a wide range of technology-related programming, including 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. This variety mirrors the CTC field as a whole, which includes a spectrum of stand-alone and integrated programs focused on all aspects of technology. A brief description of each CTC follows:

- The *Bresee Foundation* 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. High school students can 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 come from a variety of ethnic backgrounds, including Latino, African American, Asian, and others.
- 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 and 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 an online journalism program located on 125th—a major Harlem thoroughfare. 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 program's participants are mostly 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 have 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. All participants are minorities, predominantly African Americans and the children of Asian immigrants.

For each case study, a team of two or more researchers first read all available background materials for context, then spent several days visiting the CTC. During the visits, we interviewed CTC staff and instructors, youth participants, community partners, and in one case parents. All interviews were conducted in person. We observed CTC activities, reviewed key program documents, and viewed the products that youth created using technology they learned at the CTC.

On average, we interviewed 15 youth and 5 to 10 staff members and partners at each site. We developed protocols for each category of interview. In our interviews with youth, questions focused on participants' prior experience with technology, how and why they became involved with the CTC, and how

they saw themselves benefiting as a result of their participation. Our interviews with CTC staff and partners explored the orientation and offerings of the programs, their missions, philosophies, and goals, and the outcomes their programs had achieved. Given the kind of information we sought, we conducted the interviews as "guided conversations," using the interviewees' responses to direct the flow of the interview (Rubin & Rubin, 2004). We then analyzed the text of our interview notes to discern trends and to ensure that quotes used to illustrate points typified interviewees' comments.

Getting Them in the Door: Why Youth Come to CTCs?

Reasons youth attended the CTCs we visited included: access to computers, particularly specialized hardware or software; possibilities of employment, either at the CTC or through internship or job placement programs; and to connect with friends or mentors through other types of programming or social interaction. The lure of technology—the opportunity to do something "cool" on the computer—was an important draw, particularly in light of the word-of-mouth recruiting in which most of the CTCs we visited engage. In addition, with the exception of HarlemLive, youth at each site reported very limited access to computers at home.[3] Those with home computers often reported that their computers were old, slow, not connected to the Internet; lacked updated software or the software that the student was most interested in using; or were shared among siblings and others. Young people whom we interviewed also reported preferring to use technology at the center than at schools or libraries. CTCs tend to be open longer hours and over weekends and without time limits on the computers, allowing better access and also, reportedly, higher quality equipment. One student reported, "The schools have slow computers . . . [here] I practice and play with the computer." Location also mattered enormously, especially when schools were far away (as in Los Angeles, where youth could be bused an hour to school) or inaccessible (as in Firebaugh, where youth had no public or private transportation to return to school once they were bused home).[4]

Beyond hardware and software, youth reported valuing the knowledgeable staff at CTCs and their availability to help answer questions and introduce youth to new software or technologies, contrasting this to the unstaffed or understaffed computer labs at their schools. In some cases, the specialized services offered at the CTC were simply not available elsewhere in the community; four of the five sites we visited offered unique opportunities for young people to interact with multimedia technology. One young person

told us, "Youth are talented and of means. We need resources to achieve the goals and dreams in our lives. There are not a lot of opportunities in [town]. [Center] was my way to achieve my goals."

Youth who attended CTCs in the disadvantaged communities we visited were very interested in employment opportunities. At the three drop-in centers we visited, youth reported coming to the centers either directly through an internship or summer employment program or with the hopes of entering such a program in order to earn money. The other two centers' programs were focused around employment training, and hence employment and employment skills were a key motivation for youth participation there. In total, 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, these incentives operated as effective hooks for getting youth in the door and maintaining their interest.

Finally, once youth were hooked into the CTCs, they continued to return because the CTCs offered safe places for them to see friends, relate to mentors, and to be autonomous, all of which are attractive to the youth we interviewed. In many cases, youth told us about gaining a sense of belonging or being part of something that came from participating in the CTC. Those seeking specific technology-related skills and experience found that the CTCs delivered on that front. One young person reported, "If these organizations weren't here, we would be lost."

CTC Programming and Youth Development Outcomes

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 build critical technical skills for youth moving into the job market. Offering opportunities for skills building is one of the eight NRC attributes of settings that promote positive youth development. Most CTCs scored high on this attribute. At TAF, for example, participants in the Technical Teens Internship Program (TTIP) received 180 hours of training over 8 months for each of 4 years, studying and practicing network engineering, Web development, database, and programming. They then competed for paid summer internships at area companies where they applied what they learned. It was an explicit part of TAF's mission to fill the technology skills gap for people of color. The program seems to be making good strides toward this end: 75% of TAF graduates go on to major in college

in the science, technology, engineering, and math (STEM) fields, where minorities have traditionally been underrepresented.

Other youth-oriented programs also built technical skills but with different approaches. At HarlemLive, the entry point for students was journalism, but because the product was an online publication, participants learned skills such as Web design and production in an Internet environment. Its Web site (www.harlemlive.com) describes HarlemLive as "a journalism, technology, and leadership program." The appeal of the online journal was its potential to reach more people than would be possible with a paper product. One young woman spoke of "the thrill of receiving emailed responses from kids around the globe to one of her articles."

At LTC/UTEC, youth produced music and television spots, learning about both public broadcasting and digital production. Bresee's Arts and Multimedia Program (AMP) taught youth to create social documentaries using digital film and editing equipment and software. Although the products varied across sites, technology was the common learning environment.

For many youth who participated in these CTCs' programs, it was the technology that got them in the door. Once there, however, technology was only one of the benefits they received. Participation in CTCs prepared youth for the world of work in other ways, teaching them responsibility and fostering their critical thinking skills. Before beginning their summer internships, for example, TAF's TTIP participants received extensive job readiness training to learn how to behave in the workplace and what it feels like to be the only young person or person of color in the office setting. At HarlemLive, youth controlled virtually the entire organization, including making presentations to potential funders. Youth were accountable to their peers for all of their work and learned to take personal responsibility for their work. In addition to the hard technical skills, youth acquired valuable soft skills, both of which were transferable to other areas.

The youth-oriented CTCs we studied were notable for their pedagogical orientation. The five CTCs in our study employed project-oriented learning philosophies and encourage youth to work in groups. The centers fostered a learner-centered atmosphere, and the young people we interviewed contrasted this approach to the rote, singular learning style they experienced in their schools. Youth solved problems and created products at these centers, often in teams but also on their own. The benefits of this approach were not lost on participants. The parent of a child at one center reported, "The [Center] . . . helps [children]. . . . to approach and complete projects."

In addition to the technical and nontechnical skills that youth-oriented CTCs built, many also began 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 encouraged its 8th graders to think about what it means to go to college, and worked with 9th- to 12th-grade students and parents to develop college plans. TAF staff focused on all aspects of college preparation, including entry tests, essays, financial aid, scholarships, and college selection. Staff at other CTCs also discussed college with their participants, arranged for campus visits, and assisted youth with the application process. At FCLC, for example, many of the youth learned about the possibility of financial aid and how to navigate the financial aid process from the staff at the FCLC. They were encouraged to apply to college and were shown how to research scholarships online. Bresee's Connections to College program provided SAT preparation courses, and staff helped students learn to research colleges on the Internet and fill out applications and financial aid forms. The emphasis on college at these CTCs 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 the longitudinal data necessary to demonstrate an impact of CTC participation on youth education and employment outcomes do not exist, we observed a wealth of anecdotal evidence to that effect. 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 this point—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 Creating Social Capital

Both bonding and bridging connections are critical for youth development—youth need to find a healthy community to which they belong and they need mentors who can provide them access to new opportunities. Many of the NRC 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 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 NRC 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. It is one of the challenges of the digital divide, particularly with regard to Internet and broadband access, that that ability to connect is often limited.

The five CTCs we studied provided both bonding and bridging social capital. With respect to bonding, we found the strongest peer relationships at HarlemLive; this is unsurprising given that teens were the drivers at HL, with staff playing a more distant albeit supportive role. HL youth disciplined each other; participants reported that when there were problems (e.g., someone not meeting their story deadline) they worked it out through a mixture of peer pressure and peer support. The youth reported that they were attracted to the program because of this high level of self-management as well the fact that HL provided them with a cohort of similarly minded students. Youth also suggested that the experience at HL taught them to be more social; that is, it is building the skills needed for bonding social capital.[5]

TAF also abetted significant peer-to-peer bonding, at least partly because of the "boot camp" nature of the program. The time requirements of the program and strict attendance policy necessitated that participants eschew other activities (such as after school sports), as 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 being 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.[6]

The five CTCs also provided evidence of bridging social capital. Again, HarlemLive and TAF were exemplary in this regard. Both centers focused on minority youth with the philosophy that white students were 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 and TAF provided were more critical to the populations they served. The two programs created bridging social capital in different ways, however.

An important aspect of the HL experience was the ability to interview or photograph key political and civic figures in an ongoing dialogue with Harlem. HL youth have interviewed former President Bill Clinton, then Senator Hillary Clinton, Sean "Puffy" Combs, Mayor Michael Bloomberg, Bill Cosby, and others. The reporting also provides a unique set of experiences in cultivating weak ties; that is, youth were given the opportunity and training to do networking (by, for example, making cold calls to secure interviews), and HL youth reported 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 was reinforced not only through the reporting 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 was meant to spur civic engagement, another form of social capital discussed below.

LTC/UTEC also excelled in creating bridging social capital. Perhaps the strongest bridges were between diverse youth—LTC/UTEC's specific goal was to connect a diverse group of youth. Though this is important, it is analytically and practically different from connecting to others who may have more social and economic resources. We also found 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.

TAF focused explicitly on creating professional networks for its youth participants, placing heavy emphasis on college preparation and adult mentoring. The TAF Alliance was a group of business leaders who have made a commitment to internships for TAF youth or funding for the program, and Alliance members conducted mock job interviews with participants. TAF also had direct placements in work settings through its TTIP. Founder and President Trish Millines-Dziko said that TAF provided an "in" to the business networks that more advantaged youth may get through their families. One unusual advantage of the TTIP is that students were placed in a setting where they may have been uncomfortable due to dynamics of race, gender, or age. Though many participants felt welcomed and valued in their jobs, some 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." Encountering this situation at his age and having the support of TAF to process it helped this young man work through the issue and prepared him for prospective future experiences.

Some centers focused less on weak ties and more on 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." Another young person went on to say, "[Center staff] really do help you with your goals and future . . . they have the references all down pat." Even at FCLC, which had perhaps the least explicit bridging

social capital focus, students felt the bridge. One reported, "The kind of people here . . . you can talk to them. They will listen to you . . . it gives you more confidence. They will push you."

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

As discussed previously, youth are drawn to CTCs for a variety of reasons, but they stay because their voices and perspectives are valued and because they have a great deal of control over what they produce. Three of the five sites—HarlemLive, Bresee, and LTC/UTEC—used multimedia to encourage youth to think about their environments and gave them the tools to tell their stories. These CTCs used journalism, social documentary, and video production as tools, but youth who learned these skills absorbed far more than how to edit or produce media. We found that the processes of creative control and storytelling that are central to these activities promoted autonomy, leadership, and self-esteem, which in turn empowered them to think and act in ways they would previously not have thought possible.

HarlemLive, LTC/UTEC, and Bresee, all promoted creative control in that they offered youth full decision-making power in determining what they want to say about themselves, their lives, their communities, and their worlds. One HarlemLive former participant reported this as a key reason she became involved with the program, crediting HL for giving her "the chance to ask the world some difficult and relevant questions." This creative control often contrasts with their experiences in other areas in their lives in which they perceive little control; these are the children of first-generation immigrants, their families are poor, and they contend with gangs and violence in their neighborhoods. At the CTC, youth had the opportunity to tell others about the forces that shaped their lives and experiences. Creative control means that youth tell their own stories, from whatever angle they choose. This process of deciding what story is important to tell and how to tell it empowers youth and is central in promoting autonomy. We found that the CTCs provided key support for efficacy and mattering, another of the NRC eight attributes that promote positive youth development. 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."

Both LTC/UTEC and Bresee also fostered creative control. Youth at LTC/UTEC were responsible for identifying the content and managing the production process from start to finish. Similarly at Bresee, youth who participated in the

arts and multimedia program were responsible for creating a social documentary about a topic they selected. 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 nonprofit agency that continues to collect and deliver shoes to children in South America. Another young person felt that the program shaped his thinking about a project but acknowledged that the project was his own: "I wouldn't have even thought about doing a documentary, but the exposure to the changing climate in community development centers and urban sprawl gave me ideas about a final project."

Technology provides powerful tools to empower youth through storytelling. The voice youth achieved through digital storytelling was very different from what was expected at school, at home, and in the workplace. The voice gained in this medium may differ from that in other written forms (Murray, 2005), but CTCs have democratized who speaks and from what vantage point through digital storytelling, blogging, chat rooms, online radio programming, filmmaking, and even more traditional media such as public service announcements. 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."

CTCs engaged in storytelling in different forms and to varying degrees. As a magazine, HarlemLive was entirely about youth sharing information from their perspective. Youth were attracted and remained engaged because HL is a place where their voices have power and the online distribution amplifies this. Bresee and LTC/UTEC also promoted storytelling through filmmaking and public service announcements where the voices of disenfranchised youth are given power and a broader audience. Indeed, the use of digital technology allowed 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 stated, "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, viewing indigenous people." This young woman told us that she had not planned to go to college but that the experience of telling the story of her people made her realize that college was imperative—and she was in college when we interviewed her.

The five CTCs we visited promoted autonomy in other ways as well. Notably, the CTCs tended not to actively engage the parents of the youth they serve. Youth were responsible for their conduct, dress, completion of their projects, and obligations to others with whom they work. For many this was their first real-world experience with autonomy, and some of the CTCs offered guidance to help. For instance, at TAF students participated in monthly leadership workshops and gave oral presentations to hone their public speaking skills. At LTC/UTEC, youth became peer mentors who took 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

The way that CTCs fit into and interact with their communities can be important in helping them promote positive youth development. The NRC framework maintains that providing physical and psychological safety, opportunities to belong, and integration with the broader community are key attributes of youth development promoting organizations. Our research shows that CTCs are key actors in their broader communities, taking on roles far beyond their primary function as provider of technology access and services to include civic engagement and community empowerment, with a technology agenda often as a means to those ends. CTCs reach their surrounding communities and offer leadership to the community as a whole by (a) situating in locations that are safe and easily accessible to community members, (b) promoting civic engagement of participants through community-building activities, and (c) forwarding other important agendas (e.g., health care access) or offering supportive services.

CTCs have been described as anchors in the communities they serve, especially in disadvantaged communities (Davies et al., 2003). Their placement in these neighborhoods is not only important for the safety they offer, which is critically important for the youth in the neighborhoods we visited, but also for their familiarity, proximity, and accessibility. All the CTCs we visited had adults in place to monitor activities and ensure that certain types of behaviors (e.g., gang related, violence) were not present. UTEC, for instance, was developed and situated by youth themselves in response to gang violence that plagued the area. Bresee was a safe space—where gang affiliations and other negative behaviors were not welcome—in what was an unsafe neighborhood. Furthermore, Bresee youth indicated that the CTC was a location where one could drop in after school and avoid the temptation of street life. To encourage a safe environment, some CTCs even required a

dress code. Students who attended TAF and Bresee complied with certain standards of dress that precluded gang-related clothing, clothing that was revealing, and in the case of TAF, hats. These attempts to create physically safe environments were critical ways to support neighborhood youth and draw them into the center.

Location was also a critical component of promoting the community-building aspects of CTCs. The three drop-in sites we visited, in particular, were located in close proximity to young people's homes, which was especially important for CTCs in disadvantaged communities that had schools and libraries lacking the technology and services desired by neighborhood youth. For example, Firebaugh is a geographically and socially isolated agricultural community, and unlike many of its urban counterparts, the high school in town had even better computers than were available at the CTC. However, the high school was located across town from the housing complex in which the CTC was situated. Most of the immigrant families living there did not have cars and with no public transportation to bring them back to school, many of the students simply had one option for computer use—their local CTC.

Bresee was also fully integrated into its community, partly because it was based at a church that has long been engaged in social issues in the area.[7] Students who attended Bresee were likely to attend school outside the neighborhood; this is mostly because the local schools were overcrowded and busing was required; this made the CTC's location even more important as a place because school-based bonds were weaker given the need to bus back home after classes. Although not all originally from the neighborhood, staff at Bresee were aware of the important role they have in the community. Most staff, even those who were White, chose to live in the neighborhood surrounding Bresee, an area which is almost entirely immigrant and people of color. These staff reported that living in the neighborhood helped them better bridge the ethnic gap with the youth they served. Youth also reflected this view—where staff lived mattered more to them than 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," a high accolade from a teenager.

UTEC was purposefully located in the downtown area, not considered to be any particular gang's turf. UTEC staff told us that many youth who did not want be involved with gangs and drugs were seeking haven within the program. The CTC's reputation with many of the gangs gave youth a buffer from them, allowing youth to concentrate on and develop their interest in technology or the other offerings at UTEC (sports, music, dance, art). Indeed, one

newcomer to the program told us, "I've been coming here for about two weeks and I'm shooting videos and interviewing other kids on the streets . . . My boys were like 'look at you' . . . and I was like. . . . 'I can do this' . . . It's like for the first time I feel like I can do something positive with my life." Staff reported that some youth were more attached and dedicated to the program because they were able to avoid gang violence and the criminal system as a result of UTEC's intervention.

Beyond safety concerns, computers and the Internet assisted community members in a practical sense to share information about community issues and events, facilitating organizing and advocacy activities. However, some of the CTCs we visited were attempting to link these parallel trajectories, combining technology services with community building.[8]

Some CTCs provided the building blocks for civic engagement, offering explicit or implicit leadership development exercises, such as public speaking, presentations, and community-based research—skills that promote future civic participation. At TAF, students participated in leadership seminars and practiced public speaking. HL youth were especially engaged in community building due to the nature of their work. They encouraged 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. Media programs at both LTC/UTEC and Bresee supported awareness and community organizing through the production of public service announcements and social documentaries. At LTC/UTEC, youth produced 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. At the FCLC, a leadership group was formed called Grupo Unido en Acción, whose focus was community organizing. Though it was primarily an adult group, the group discussed and acted on issues that affected the larger community, including employment challenges, outreach, and communicating with local government. According to the former executive director of the FCLC, who was at the time a fellow at the Community Technology Foundation of California and herself a model of an engaged citizen, "Successful programming is driven by the community."

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 schools, churches, and other organizations is important for both comprehensive service provision and community organizing. Many of the CTCs we visited had

well-established partnerships. HL worked with Public Allies, an NYC agency that places youth in leadership positions to strengthen commitments to public service. Bresee was affiliated with its founding church and its extensive network. FCLC worked 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 was a group of business leaders who committed internships, funding or both to the CTC. At LTC, partnerships were a core part of their model—they coordinated and led the 23-member LTC Consortium that provided a dense network of prominent local and regional actors. Buy-in and assistance from the larger community greatly assisted the 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 were also sometimes provided by the CTCs themselves. Generally the services were 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. If possible, supportive services were provided on site (e.g., health care services at Bresee) but often knowledgeable staff gave referrals for services provided by 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.

Discussion

We began this study trying to understand and document how youth in disadvantaged neighborhoods interact with technology. Our goal was to offer a set of qualitative assessments about how community technology centers (CTCs) bridge the digital divide and perhaps offer a guide to improving technology access practices. Our research led us, however, to an unexpected conclusion: It was not really about the technology *per se* but rather about how CTCs, like other high-quality youth-serving programs, align the tools they use with the broader goal of positive youth development.

Employing the NRC framework for features of positive youth development, this study of five community technology centers (CTCs) nationwide explicitly links community technology with youth development, demonstrating the natural pairing between the two. Although each CTC individually did not possess all of the characteristics laid out by the NRC, as a whole, these CTCs provided youth with settings and tools that appeared to help minority

and disadvantaged youth acquire skills and empowered them to think differently about their own futures, their communities, and the prospects for success in both.

Our study highlights four interconnected ways that youth participating in CTC programs gained from these experiences. First, as is critical in the information age, they gained skills that are increasingly required to obtain even entry-level jobs. Participants at CTCs learned skills that ranged 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). Second, CTCs supported the creation of social capital for youth in two main ways: through the formation of bonding networks—with one's own peers at the CTC—and bridging networks—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.

Third, we found that youth used 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 was empowering because it allowed these youth, who often see misrepresenting media images of themselves, to identify what they viewed as important in their communities and portray it in a way that was real to them. Finally, we found that CTCs played a critical role in the community not only 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.

These four sets of findings are highly interrelated. Skills-building activities affected 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 promoted the integration of disenfranchised youth into broader social and community networks and at the same time positioned themselves as community hubs and resource providers. CTCs in our study linked skills mastery with the creation of social capital in ways that offered 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? First, a caveat: 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 and also to determining how effective this sort of intervention is to youth development in general.

Still, it seems clear to us now that the digital divide is a concept that encompasses not only technology but also social distance; 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 digital access can serve to overcome the isolation faced by disadvantaged individuals and communities. CTCs are a community-based intervention to overcome that isolation—by design, they are about building social capital and empowering youth to use available resources to hone their technology skills and express their points of view. Being more explicit about this in both analysis and practice could lead to a clearer understanding of roles, and perhaps, better programs.

It also seems clear that a very important aspect of youth development, particularly for youth in disadvantaged communities, is about providing supportive peer networks and connections to a broad range of opportunities. 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. The programs we visited were all clear about providing new skills, a safe space, and opportunities for working together. Where they varied most was in the type and effectiveness of their bridges to future opportunities, both through employment and civic engagement. To the extent that strong bridges are combined with strong bonds, it may be that individuals view CTCs not so much as helping them "get out," as providing them with an opportunity to "get ahead," and perhaps return to help other youth. Many of the CTC directors are very clear about this bridging role and we would suggest that this focus is well placed—after all, crossing the digital divide is itself all about bridges.

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Notes

1. Schools are also an important point of access outside the home, but schools in the low-income neighborhoods we visited tended to also have subpar access to computers and the Internet.
2. On the other hand, many have hypothesized that increased Internet use can result in social isolation, a proposition not entirely borne out in research (Gross, 2004), and other problems (see a review in Lazarus & Wainer, 2005).
3. The one exception is HarlemLive, where young people did report having computers in their homes.
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.
5. However, as usual, social networks also run the risk of being semiclosed circles—HL seems to do little outreach to immigrant youth, also present in Harlem, with the rationale being that because such immigrants may not be accustomed to the African American youth culture which dominates at HL and there would be too much "hand holding" in what is an operation that requires and facilitates significant youth autonomy.
6. 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.
7. We should note that Bresee did have a faith element in its community-building—it was founded by Reverend Jeff Carr, a shared Christian faith was important to many of the staff, and it was clear that this helped fortify the staff commitment to the program and the neighborhood. We do not stress this element in the text, however, because the community building was replicated in other ways in different sites and because our rather insistent questioning and our own observations suggested that there were no pressures put on youth participants to be part of the church itself even as they were being invited to part of the CTC.
8. 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.

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