

# **The Community Information Organizer Program**

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Final Report to the W. K. Kellogg Foundation

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## ***1 Executive Summary***

The aim of this project was to explore ways in which computers can be used to build social capital. Specifically, we sought to help teenage residents of underserved communities develop information, communication, and technology skills that would allow them both to create and become resources in their neighborhoods. To this end, we created several afterschool programs for teenagers. We worked with the Student Advocacy Center to run a program at the North Maple public housing development in Ann Arbor, with the Flint Public Library to run a program at their main branch, and with the Neutral Zone in Ann Arbor to run a program at their drop-in center. These programs offered participants opportunities to learn about computers and about community change. In addition, we worked with YouthBuild affiliates in Pittsburgh, PA and Bloomington, IL to enhance the use of information technology in their alumni clubs.

We found evidence of numerous positive outcomes, including increases in teen and community capacity, teen social development, and a potential for heightened political engagement in the future. At the same time, implementation introduced many challenges.

One of the central tensions that emerged was the need for structured projects that would create early experiences of success and while at the same time there was a need for teens to define and structure their own projects, in order to develop buy-in to the projects and leadership skills. We believe that this tension will always be present in such programs and there is no one best way to manage it. The right approach will vary depending on the characteristics of the participants and program goals.

## ***2 Summary of Answers to Kellogg Evaluation Questions***

### **2.1 How many youth at the sites were chosen to participate in the projects?**

North Maple, Ann Arbor: 23

Flint Public Library: 30 first year; 14 second year

Neutral Zone, Ann Arbor: 10

YouthBuild's activity was directed toward increasing its organizational capacity, not on running a direct program for youth, so there is no relevant statistic to report here. We note, however, that the staff alumni coordinators we worked with at both sites were themselves recent graduates of the respective YouthBuild programs, so were part of the target population we wanted to work with.

### **2.2 Was this number what was expected?**

Yes. The number at North Maple in Ann Arbor was slightly larger than originally planned, but our partners correctly predicted that several would drop out, so we included all 23 at the beginning.

### **2.3 What are the benefits to the community from the projects the youth achieve?**

There were some direct benefits from the projects the youth carried out, as described in section 6.3. The long term impact from the investment in human and social capital, however, will likely be much larger. For example, the leader of one community organization in Flint clearly was energized by the commitment and caring that the youth showed for her organization.

### **2.4 Are these projects strong enough to continue in some fashion over the next two years?**

One of the youth projects, the SOURCE, served as inspiration and prototype for a new teen-focused event calendar that the Flint Public Library now maintains on its web site.

The Neutral Zone in Ann Arbor plans to continue and expand its youth entrepreneurship programs, building on the pilot program conducted as part of this grant.

YouthBuild Bloomington is planning to continue the experimentation with information technology that it began in this project. Its next project is to create a photo directory of its alumni.

### **2.5 What types of social capital existed when the project began?**

While there were large individual variations, the teenagers who participated in the program tended to have limited social networks beyond their immediate friendship circle, and limited trust, especially in adults they didn't know well.

The partner organizations (SAC, Flint Public Library, Neutral Zone) all had significant institutional connections with community groups, and these constituted an important form of social capital that we drew on in running the programs.

### **2.6 Has the information project had an impact on the community's stock of social capital?**

Overall, the communities did increase their social capital. Existing institutional connections between the Flint Public Library and other local organizations were renewed, and some new links were established, both through the youth projects and through a workshop on youth activism. Teenagers involved in the projects expanded their awareness of local community activities, thus expanding their social networks. Some adults at North Maple began to view the youth there as resources, once they saw demonstrations of their technical skills and their interest in organizing community service activities, and this change in perception is itself a form of social capital. At YouthBuild Bloomington, alumni interest in the newsletter increased with the increased number of alumni photos in the newsletter. All these social capital impacts are discussed in section 6.4. In addition, at North Maple, youth developed advocacy skills during a funding crisis for their community center, as discussed in section 6.6.

## **2.7 Has the information technology created social resources that can be reused at a later time?**

In contrast to the social capital benefits for the community at large discussed in response to the previous question, we take this question to refer to the social capital benefits that accrued to the participants. In Flint, youth developed trust relationships with the librarians, relationships that are available for future mentoring when it is needed. This is discussed in section 6.4. More generally, the participants in all the programs developed positive relationships with the graduate student coaches. In addition, many of the youth developed social skills, such as communicating with strangers, as discussed in section 6.5.

## **3 Objectives**

The goal of this project was to help residents of underserved communities use information technology to build individual and community capacity, and to foster connections among people. Specifically, through afterschool projects in several different environments, we sought to help teenage residents develop information, communication, and technology skills that would allow them both to create and become resources for the larger community.

## **4 Program Strategies**

Our main strategy was to create afterschool programs for young people living in economically distressed communities. Three core attributes informed our designs for the programs. First, the programs were intended to provide a safe but challenging environment in which participants could learn. Second, we recognized that the teenagers entered the programs with a variety of skills and knowledge, and we hoped to offer experiences that would allow them to build on these competencies. Third, and finally, we sought to consistently recognize the value of the teenagers' contributions, and to actively encourage their involvement throughout. We pursued these objectives in three very different venues, using strategies appropriate to each, with differing outcomes.

Using Kellogg funding, we established programs in Ann Arbor and Flint, Michigan and through programs in two locations operated by Youthbuild. In both Michigan locations, the University of Michigan's School of Information (SI) partnered with an organization already established in the community. Our partners in Ann Arbor were the Student Advocacy Center (SAC) in the first year and the Neutral Zone in the second year, and our partner for two years in Flint was the Flint Public Library (FPL). These organizations worked with their respective communities to provide a space for the afterschool program, recruit participants, identify community partners, participate in the program's design and evaluation, and work alongside the project staff from SI during implementation. In Flint, the program met at the main branch of the library. In Ann Arbor, the first-year program met in a small public housing development, in a housing unit that had been converted into a community center; the second year program met at the Neutral Zone, a teen drop-in center.

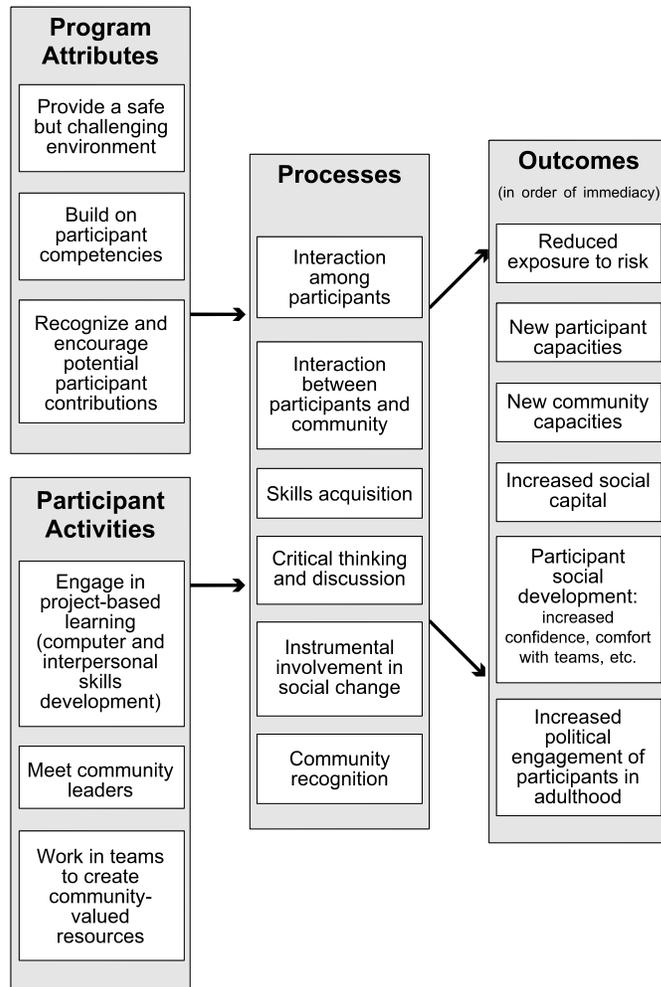


Fig. 1 – Theory Model for Year 1

The first time the program was offered, from September 1999 to April 2000, participants engaged in several types of activities intended to help them develop technical and interpersonal skills. First, they took part in a series of projects designed to expand their computer skills. Program facilitators, called coaches, introduced computer hardware and software in the context of practical projects. Second, participants met leaders from the local community. Individuals associated with successful organizations and projects regularly attended program sessions to speak about their work and how they became involved in it. The teenagers were encouraged to ask questions, and were challenged to think about what they might contribute to these groups with their new skills. Third, the teenagers worked in teams to create community-valued resources. They were challenged to creatively apply any of the information skills they had

learned to community needs that they identified. The theory model presented in figure 1 represents the conceptual operation of the program during this period, though it did not turn out exactly that way.

Our experience with the first year of the program led us to make several changes in its design before repeating it. In Flint, the model itself changed. We changed both when and how to introduce the technology; we reduced the number of participants and coaches; we changed the roles of key players; we eliminated the group projects, replacing them with individual focus while maintaining group learning sessions; we added peer mentoring by two teens who had completed the program the first year; and, finally, we involved all teens as trainers in the branches at the end of the program.

During the first year at Flint we had 6 coaches and 30 participants. During the second year, we identified 2 coaches for 12 students. We decided that the coaches we were recruiting would be more effective as technical consultants and educators, than as youth

development mentors<sup>1</sup>. Timing of the technology component was changed at FPL during the second year; initially it had preceded the community component. During the second year these skills were more integrated.

At FPL during the second year we made more use of the skill sets of all staff. The library's Young Adult Services staff and computer lab staff all had at least 5 years of experience building web sites, and fairly extensive experience in manipulating digital images for the Web and training others on these topics. The two graduate students from University of Michigan School of Information brought different skill sets. One was very experienced with highly technical aspects of web programming, while the other was a former educator and somewhat less experienced in web authoring. This was a good combination, because the educator developed lesson plans to accommodate the "tech" person's training objectives.

At FPL, the model recognized the mentoring role of the librarians. Mentoring is a normal part of their experience as youth librarians. During the second year we drew more effectively on their experience as seasoned youth professionals. Librarians felt that the teenagers were more focused and productive when given a specific task, and guidelines for achieving it. This was based on the first-year participants' projects, which only seemed to move forward when the teenagers were required to meet objectives established by the adult leadership. Second, they discovered that working in groups resulted in an unbalanced distribution of effort. Some teenagers would engage with the project, while others would sit by idly.

An important new component in the Flint project, was the addition of two student mentors who were 'graduates' of the first year program who came back to work with twelve new students.

FPL maintained the emphasis on project-based learning, and the group-work component. The projects that the teenagers undertook were also more individually focused. Students, often with guidance, chose the group to work with. Participants were expected to develop the content for a website, work with the organization to interview appropriate staff, and develop the website with the organization's input. In addition, they were to teach a subset of the skills they learned to groups of younger people.

The major problems in year one in Ann Arbor were the lack of infrastructure and the lack of availability of staff in the lab. This resulted in a number of problems that were frustrating for us and for our partners, and extremely difficult for the student participants. An important lesson of this collaboration is that there must be a basic level of information infrastructure and staff support and knowledge before a program of this type can work effectively.

Thus in the second year in Ann Arbor, we moved the program to another venue, helping to run a program at the Neutral Zone, a thriving drop-in center for teens with a range of activities, many of them relating to music and the arts. For that program, we provided a specific idea for a business the teens could start that would use computers to help build

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<sup>1</sup> The reasons for this are discussed in section 7.1.

social capital. The teens would make membership directories for organizations, interviewing and photographing members and the using a database to created printed directories. The teens met weekly at the Neutral Zone with two coaches, one a social work student on the staff of the Neutral Zone and the other a public policy student hired by us.

In addition to the after-school programs in Flint and Ann Arbor, we worked with two local YouthBuild affiliates, in Pittsburgh, PA and Bloomington, IL, to help develop information systems to strengthen their alumni clubs. In both cases, graduates of the YouthBuild program had been hired on as staff to offer alumni services. A \$5,000 subgrant to each site and a planning visit from an SI faculty member helped them to upgrade their technology in order to include photographs and offer more professional-looking newsletters.

## **5 Evaluation Methodology**

We employed quantitative methods and hypothesis testing as well as qualitative methods and theory development in our evaluation of this program. Looking at the program from these varied perspectives allowed us multiple opportunities to understand the program's effects and to learn about the processes driving them.

### **5.1 Quantitative**

We collected data on participation levels, and on participant demographics for the first year of the after school programs. In addition, we tried to measure changes in participant attitudes, using questionnaires. The questionnaire was developed by the SI team based on instruments created in the fields of education, political science, and psychology. It was designed to measure a variety of attributes, including self-efficacy, academic behaviors, social capital (trust and civic engagement), attitudes toward teamwork, and attitudes toward computer technology<sup>2</sup>. This content reflected the spectrum of long-term outcomes that we anticipated. The surveys were administered twice, once at the first program session, and a second time at the program's completion. In our analysis we reviewed the distribution of responses before and after the program, and of the matched-pair changes observed. Significance testing was considered of limited value due to the small sample size. Lack of significant quantitative data point to the value of qualitative approaches discussed below.

### **5.2 Qualitative**

We had multiple sources of qualitative data. Periodic participant observations and focus groups were conducted at both sites, generating hundreds of pages of notes. Participants produced work both on paper and electronically, which we collected for analysis. Coaches, the graduate student mentors who worked directly with the teenagers, kept journals in which they reflected on their daily experiences. Working in small groups the

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<sup>2</sup> The surveys are attached in Appendix A.

coaches also prepared project reports intended to capture their larger perception of the program. Feedback from teenagers was regularly solicited. Lastly, two focus groups were held with Flint second year participants at the end of the program.

## ***6 Activities, Outcomes and Lessons Learned***

The two sites at which the afterschool program was implemented were very different, and the program in Flint changed considerably from the first year to the second. These differences significantly influenced implementation and outcomes. In the discussion that follows, we will attempt to both draw out the similarities between the various forms of the program, and consider the differences.

### **6.1 Teen participation**

One of the most immediate measures of success is how many teenagers participated, since all other benefits were contingent on this. We met our participation goals at the two sites, though we employed different recruitment strategies to do so.

#### *6.1.1 Demographics of the Ann Arbor public housing site*

In Ann Arbor, we targeted all teenage residents of a small public housing community. The Student Advocacy Center (SAC), our partner, had a reputation for sponsoring successful youth activities in the community. In addition to the opportunity to work with computers, the program offered teenagers high school credit and a \$21 weekly stipend.

#### *6.1.2 Recruitment of Ann Arbor public housing teens*

SAC staff members went from door to door telling parents about the program, and encouraging teens to participate. Of the estimated 35 teenage residents, 23 originally agreed to participate. In a few cases, young people under the age of 13 were allowed to participate because of their interest and enthusiasm. This sample included 21 African American teenagers, and two who were white. Over the course of the program, about half of these teenagers stopped attending meetings. Though disappointing, SAC had predicted this level of attrition. When the program began there was an even gender distribution, but disproportionate attrition left a predominantly male group.

#### *6.1.3 Demographics of Flint*

The Flint Public Library serves a community that has been dealing with a difficult economic situation for some time. Flint, Michigan, with a population of about 125,000, was once the hub of the automotive industry. General Motors was the single employer for years until the company began to pull out of the community ten to fifteen years ago. At present, an affluent county surrounds the economically stressed urban center that is struggling to revitalize itself. The median household income is \$20,176. The city of Flint is about 53% African American, 41% white. Those individuals who relied on

employment by GM are now unemployed or have moved. Many are looking into retraining or further education.

The school system's technology is underdeveloped. Students have little opportunity to use computers, and teachers are doing their best (with minimal staff development) to incorporate computers into their curriculum. The tax base continues to drop and charter schools lure families away from neighborhood schools. Quality education in Flint presents a significant challenge – from low MEAP (Michigan Educational Assessment Program) scores to sagging infrastructures, from uninvolved parents to poorly motivated children.

Flint participants appeared to have an optimistic outlook in spite of poor surroundings, perhaps due to FPL focus on the positive side of Flint. One participant in the second year program, for example, indicated in the final focus group session: “I did my web page on things that are newly built around Flint. And I did that because I stay in as you say the “hood” part of Flint (laughter) and so it's pretty rough over there and people, every time you mention that area they just go “oo that's the ghetto” but they're fixing it up now and I wanted to recognize what was being fixed up in that area so I did job corps and those community estate houses over there. I did the houses because I thought they were nice and they looked real good. And then I did job corps because I thought it was a good program and I wanted to research the program because my cousin go to job corps.”

#### *6.1.4 Recruitment of Flint teens*

The Flint Public Library does not apply means-testing to the people it serves. It serves the entire community. Rather than recruiting in the community directly, the FPL worked with high school guidance counselors, as they customarily do, to identify and attract students to the program. As the result of an ongoing relationship identifying students for participation in many library-sponsored youth programs, the counselors know the type of students that fit the profile for the program: youth with ability but neither reaching their full potential nor failing (B or C grade average). In practice, the counselors may have selected somewhat higher achieving students than the desired profile, as noted below. A total of 30 students were selected in the first year and 12 in the second based on their ability to stay in the project for its duration, and on general interest in learning about computers and their community. Interested teenagers were required to bring a resume and to interview for the positions, though the librarians' real concern was the applicant's willingness to commit to the program. The incentive structure was also different in Flint. The public library hired the teenagers as part-time employees, paying them \$7.00 an hour for up to six hours per week. They were not offered school credit. Thirty-one teenagers were recruited for the first year, with only one student leaving the program permanently. Thirty of the participants were African-American, and one was Mexican-American. Seventeen participants, about 65% of the group, were female.

Based on self-reporting, the participants in the Flint program had different academic backgrounds and inclinations than those in the public housing project in Ann Arbor. Participants in Ann Arbor were less likely to say that they contributed in the classroom

that they felt confident about their ability to do their work, less likely to earn good grades (Cs in Ann Arbor versus As and Bs in Flint), and less likely to want to attend college after high school. Coaches in Flint were struck by how academically motivated and self-confident participants seemed, noting for example that some belonged to their high school honor societies. The survey data also suggest that Flint teenagers may have had a different economic profile. For example, the majority of them reported having computers with Internet access in their homes (versus only one teenager in Ann Arbor making this claim), although their limited computer and Web skills cast some doubt on the legitimacy of this self-reported data.

#### *6.1.5 Demographics and Recruitment at the Neutral Zone*

The business development activity at the Neutral Zone in Ann Arbor recruited participants through publicity to teenagers who already attended other activities at the Neutral Zone. Participants were not paid for their time, except on a few occasions when they found paying customers for their business. Here, too, there was significant attrition. Of nine original participants, and one who joined at mid-year, five continued to attend regularly throughout the year. Four of the five were minorities; three were female.

#### *6.1.6 Lessons*

- Partnering with community organizations is valuable in establishing new programs. They help establish legitimacy, and know best how to reach their community.
- Different recruitment strategies and environments attract different participants.
- Plan for attrition. In our case, this meant offering a diverse set of incentives, and, in one site, recruiting more participants than we expected would stay.
- Girls can be effectively attracted to a technology-based program.

### **6.2 Increasing participant capacities**

Work portfolios and coach observations provide evidence of the participants' expanding range of capabilities. The teenagers developed new technical and communication aptitudes, and saw growth in their social and teamwork skills. Most also learned more about their community. By the end of the program, teenagers had adopted an array of computing technologies to support their project work. Hardware, like digital cameras and scanners, and software, including word processors, graphics editors, browsers, and web page editors, were among the tools the teenagers used each session.

The teenagers learned, sometimes with difficulty, to communicate and to work together. They struggled with collaboration, trying to agree on group objectives – for one group this was a source of debate until the very end – and learning to divide large tasks among themselves.

The teenagers also learned about the challenges of working in a complex and dynamic environment. The projects changed over the course of the program as new constraints were discovered, and the teenagers learned that the community landscape shifts over time. For example, one particularly enthusiastic group of teenagers was forced to come

up with a new project when the group they were working with, an African-American museum in Flint, closed unexpectedly.

Participants presented their projects at both sites to people within the program and to those outside it. Teenagers from both sites participated in a School of Information-sponsored exhibition of student work.

Flint Public Library staff held periodic public celebrations designed to foster the self-confidence and presentation skills of the participants as well as to have them exhibit their work with pride was an integral part of the Flint project. Students and staff invited parents, non-profit organizations, local community leaders, and the local news media including the local television station to these events that were always accompanied by refreshments. Students had opportunities to present their work briefly to the entire group and demonstrate it at one of the computer stations in the lab. In addition, a few students had the opportunity to make public presentations at venues sponsored by the W.K. Kellogg Foundation both years of the program.

As instructors to younger children, some graduates of the program returned to share their skills with youth at other library branches and to create a basis for maintaining the work started by the initial group.

For some of the teens in Flint, these skills turned into employment opportunities. The FPL hired one graduate of the program to do web development for the library, while two first-year participants returned as teen mentors in the program's second year.

### *6.2.1 Lessons*

We learned a great deal about helping teenagers acquire these skills, both from our successes and our shortcomings. Here are the most important lessons, divided into three categories.

#### 6.2.1.1 Program philosophy

- Our project-based approach was successful. The teenagers learned a wide variety of skills by working through small projects and examples. We discovered, however, that they were even more receptive to learning skills when they needed them to reach an objective associated with their own projects. This suggests that an “as-needed” teaching approach may be even better. We believe that these strategies can be effectively combined. For example, general-purpose computing skills, those that everyone in the group needs and that can be applied to a variety of tasks, may be best taught using prepared projects. More specific skills, like those used in a small family of applications, can be subsequently taught as the need for them arises.
- We found several strategies for maintaining a balance between teenager and adult leadership. A guidebook spelling out expectations, like objectives and deadlines, can provide a productive constraint, while allowing teenagers to negotiate changes, justifying variations from these guidelines, provides needed flexibility.
- It was important for us to remember that the teenagers were encountering challenges that they did not have the language to describe. We learned that it is crucial to be

patient, acknowledging that the task is difficult, and encouraging them to talk about their frustrations.

- It is important to provide a range of practical examples of the kinds of projects the teens might develop. Initially, we had only a few untested ideas for projects (and a pointer to the successful HarlemLive web journalism effort in New York). At the recommendation of the Flint librarians, who were attuned to community organizing by teens, we included workshops both years by youth advocate and activist, Wendy Lesko <<http://www.youthactivism.com/>>.
- On one hand, there is evidence that teenagers will be more committed to projects of their own design. The more responsibility they have, the more investment they feel. On the other hand, early success, which also contributes to increasing the teenagers' commitment level, is more difficult to achieve in less controlled environments. There are tradeoffs associated with each extreme. Selecting the right mix depends on the program context. Some of the variables affecting the decision include the teenagers' skills and experiences, the adults' skills and experiences, the venue out of which the program operates, and the position of these activities in the larger culture (that is, what understanding of the tools and objectives do participants bring to the program?).
- We found that it is difficult to effectively measure the impact of these programs on teenagers; many of the most important impacts (e.g., a lifelong civic commitment) will be visible only years later, and many factors besides the program will have contributed to such impacts. .

#### 6.2.1.2 Environment

- Groups of 15 or fewer participants with a 5:1 or 4:1 coach-to-teen ratio worked well.
- The participants were most responsive in an informal, teen-centered friendly environment that is fun to participate in. Maintaining this atmosphere can be a challenge, as the teenagers also needed guidance and supervision. In our case, this responsibility fell to the coaches, who, over time, learned to negotiate the complex role of supportive mentor. To accomplish this required a great deal of effort by all involved—participants, staff, coaches, and leaders.
- Consistency was important. Attendance and participation were better at meetings that took place at the regular time and place.

#### 6.2.1.3 Technology instruction

- An overarching lesson was that the principles of effective teaching are always important. Our project team included a graduate student from the School of Education who provided the coaches with valuable suggestions and guidance.
- Teaching computer skills requires more than an understanding of the technology. It is also important to be able to convey when, where, and why the technology can be valuable.
- The instructor also needs to be confident about his or her skills, and enthusiastic

about sharing them.

- Get regular feedback from the teenagers, and don't count on them to ask for help. Keep the instruction style interactive, and check progress on individual work frequently.
- Leave lots of time for practice. Also leave free time, time during which teens can be "off-task". Playing with the computers is a great way to learn.
- Establish milestones and celebrate successes. Setting attainable goals early in the program and then marking their achievement, for example taking an hour or two out of a session to eat pizza and ignore deadlines, can be reinvigorating for participants and staff alike.

### **6.3 Community resources/capacities**

Teens, working individually and collectively, took on projects intended to address community needs. They were strongly encouraged to identify a community audience for this work. Highlighting a few of the results sets the stage for a discussion of increased community capacity.

***Basketball court renovation:*** Team members in Ann Arbor met with residents, community leaders, and local political leaders to raise awareness and gain support for their proposal to renovate of the community's basketball court. Their use of information technologies emphasized its practical application, creating flyers and drafting letters on the computer. By the end of the program, the community had allocated money to fund the project. Ultimately, however, the team lost momentum without the support of the coaches and the project has not been completed.

***Lyrics versus stereotypes:*** A team in Flint hosted a forum bringing together teenagers and adults to talk about rap lyrics. At the forum team members gave a presentation describing what the lyrics meant to them, provided copies of controversial lyrics, showed several music videos, and facilitated a discussion among attendees about the music. Afterward, they created a web site complementing the forum. On the site visitors could read about the comments made at the forum, see lyrics, and learn about the project and the teenagers behind it.

***Kids café:*** This Flint group created a public-awareness campaign for an afterschool program for young children. They help publicize the organization with posters, flyers, stationery, a web site, and a press release. They also created letterhead and stationery that members of the organization could print themselves. The organization's leadership was deeply moved by teens' concern, their dedication, and the contributions they made.

***The SOURCE:*** Team members created a Web site providing information about Flint-area recreation opportunities. The site highlights existing sports recreation programs and events. The site also included rules for a variety of sports, and links to other sports-related sites. This project inspired the FPL to integrate a teen-focused events calendar into its site.

***The Nina Mills Awards Honoree profile site:*** A young woman in the second-year Flint program wanted to raise awareness about the Nina Mills Achievement Award, which

honors successful women in the Flint community. She created a web site describing the award, and containing photographs and biographies of the almost 50 awardees.

***Downtown Flint:*** Another teen in the second-year of the Flint program wanted to understand how and why Flint is no longer the robust and economically prosperous city it once was. To do this, he sought out a long-time Flint resident and business owner and interviewed him about his experiences in the city. He posted excerpts from the interview on the Web site. The site also included a photo gallery containing pictures of Flint from the 1800s to the present.

More information about the second year CIAO projects in Flint is available at <http://www.flint.lib.mi.us/flintprofiles/>.

Two of the project evaluation questions focus on the utility and sustainability of the tangible information products and services that the youth created. In many cases, the projects had limited external audiences and have not sustained themselves. Projects like the SOURCE or the Nina Mill Awards profiles would require regular maintenance to be useful, and no one was found to take this responsibility. The SOURCE may have come closest to achieving sustainability, as it became the prototype for a new FPL supported web resource. Other products, like the web site about downtown Flint, though potentially interesting to some community members, would be more likely to be reused were they part of a more complete and better known information resource.

The most important resources produced, however, are less tangible. The teenagers who participated in this program acquired a variety of skills, both technical and social; met community members; learned about community organizations; and combined these experiences in a community service project. The products were not perfect; the lessons learned in completing them are far more important. The teenagers, with their new skills and broader horizons, are the most important community resources.

The community's response to the second workshop by Wendy Lesko was an example. When her workshop was announced to the participants, word got out and the program organizers were faced with the unexpected task of either incorporating adults into this community action workshop or turning them away, disappointed. The leadership chose to include them.

It will take some time to see the impact of this experiment on the community although it appears to have the impact of a pebble dropped into a pond, gently expanding circles of influence. For example, a story shared by one of the participants, Kristina, illustrates the value of the program to her family. An adult friend of hers saw a local news report on the celebration marking the completion of the CIAO web projects, and called the family to offer congratulations. The next day her mother made the significant investment of buying a computer. "This week has been crazy," Kristina told the librarians, "every five minutes it's 'Kristina! Come help your mother' and I have to go open up Word for her or something." Kristina plans to build a web site for the family business using the new computer. What really impressed one of the coaches was that the program made it possible "for one of our students to literally burst through the digital divide... (and take) her entire family with her."

### 6.3.1 *Lessons*

- Spend time understanding the problems that concern participants. Teenagers often want to choose a project quickly so that they can move on to the “real” work. But designing a project that is responsive to a community need takes time. Selecting too quickly can also result in projects that the teenagers aren’t willing to commit to for long. Slow down in the early stages: the results will be much better.
- A community audience is valuable. The teenagers benefit greatly from being able to talk to real people about their project ideas.
- Introduce the community connection (and community projects) from day one. There are two key reasons for this. First, helping teens understand what it means to have a community audience, and then helping them find one, is difficult and time-consuming. Second, teenagers find it easier to apply new skills when they learn them in the context of meaningful work.
- Talking about sustainability from day one. Preparing for long-term maintenance should be an integral part of project planning.
- Think big, but be prepared to compromise. Teenagers won’t always understand what is involved in achieving their goals. Help them to scope out a project that they will be proud of, but be ready to help them scale back if the need arises.
- Create opportunities for success early on in the program. As the quote at the beginning of this paper suggests, people living in underserved communities need the opportunity to learn for themselves what they are capable of.
- Be prepared for skepticism. Many of the participants in our program had witnessed failed attempts at community change, and it was at times difficult to persuade them that they could make a difference with their actions.
- Community recognition is important. The greatest potential lies in the future work teenagers could do in their community. Recognition helps the teenagers feel good about their work, creating an incentive to do more, and raises awareness of their talents in the community, building demand for their contributions.

## 6.4 **Social Capital**

Social capital is a specific form of reusable social resource. It refers to value or capacity inhering in the connections among members of a social network or structures. Detecting changes in the amount of social capital available to an individual or community is difficult, especially over a short period. Our quantitative measures of social capital (in particular, trust and civic engagement) failed to reveal an increase using instruments. There was, however, evidence of the processes that are known to contribute to the creation of social capital, like interaction among the teenagers and other community members, the instrumental role that teenagers played in community change, and community recognition, especially in Flint. We detected qualitative evidence of increases in two forms of social capital: the willingness to trust and the creation and maintenance of weak ties, both among individuals and among organizations.

Leaders noticed increasing youth trust in staff and graduate students coaches.. Teens shared stories and aspirations with them. At the end of the second year program one of the teenagers arrived at the final program session wearing her high school graduation cap and gown, indicating how much she valued the respect of the staff and coaches. Libraries are not normally considered places where teens share their personal triumphs. As one student commented during a focus group after the end of the program in Flint:

*“when you think of a librarian you always think of a little nerd type person with a pocket protector and the glasses and everything; shh, you got to be quite, because you’re in the library. It’s kind of getting to know the librarian behind the glasses and pocket protector type thing. Like I said their personalities are just so beautiful and interesting. And they’re all goal driven and everything.”*

The particular relationships may carry mentoring value, if the youth maintain them. More importantly, they leave a lasting impression that affects the willingness of youth to form trusting relationships with adults. The same student, when asked what she will remember most about her experience, responded:

*“The coaches, most definitely, the coaches. Last year we had one coach, his name was Joel and him and Erica’s personalities are a lot a like. They’re outgoing and outspoken, but they help with the creative process and everything, being original, and with the web sites... they were just the kind of people who help and make an impact on your life that you remember them. It’s kind of like, well, I’ll always remember that type thing.”*

In addition to developing trusting relationships, the youth expanded their range of contacts in the community. At the Neutral Zone, the youth interacted with adults in a sports league for whom they made team directories. As part of their projects in Flint, the youth learned about the individuals and organizations they were working with. As one student put it:

*“So, learning how to work with web pages and work on the Internet and then working with the different community organizations, it has helped me not just with the computers, but it has helped me get involved more than I was in my community... I’ve helped the neighborhood round table create their web site...I had never heard of Urban Gardens and that is a community program, where they take kids within a community and they take a plot of land and they actually do gardens. The kids learn to work with each other and they learn to work with things in their communities and they learn to work with their hands and things. I had never heard of that before; and I heard about that and it’s kind of like, okay there is another good something in Flint that’s going on.”*

The programs both strengthened existing institutional ties and created new ones. This happened in part through the particular youth projects. In Flint, ties also built through a

workshop originally intended to help the youth see their projects as part of a larger picture of youth activism. Word of Wendy Lesko's workshop spread rapidly from the teens to others in the community resulting in an oversubscribed program.

At YouthBuild Bloomington, they bought a public access computer station for alumni to use, which had two social capital impacts. First, when alumni came in to use the station, they also chatted with staff and other alumni. Second, at least one alum got an Internet email account and used email to stay in touch with other alums. They also bought a digital camera which allowed them to include more photos of alumni in the alumni newsletter, sparking greater interest in the newsletter. They are now in the process of making an alumni photo directory, to help alums from different classes connect with each other.

The director of YouthBuild Bloomington also noticed the social capital implications of cell phones, although they did not spend any of the grant money on this technology. She noted that they have had a much easier time staying in touch with alumni who got cell phones. Some of them also subscribed to a service that provided free talk time with people on a "buddy list" and alumni were keeping in touch with each other that way. The directory noted that many alumni could get pre-paid cell phones even though they couldn't pass credit checks necessary to get land-line phones. This insight wasn't a direct result of the grant, but it may be a pointer to where things should move in the future with social capital building through information and communication systems.

#### *6.4.1 Lessons*

- Trust building takes time and indicators are often subtle.
- It was hard for both the participants and the staff to focus on this goal in the abstract. We found that before we could act on it, we needed to frame it in more concrete terms. For example, by requiring that teenagers find and work with a community audience, we hoped to create the kinds of social interchanges from which social capital emerges.
- Community interaction and recognition is particularly important when the resource sought is new social capital. Because social capital only exists in the context of social relationships, its creation is contingent on social interaction, while public recognition can reinforce and strengthen it.

### **6.5 Personal social development**

Several forms of social development were evident over the course of the program. Parents and program staff were thrilled by some of the transformation they witnessed. In Ann Arbor, several parents praised the program for the boost in self-esteem and confidence that they saw in their children. In Flint, a Mexican-American student was able to overcome the paralyzing embarrassment he felt because of his limited experience speaking English. At the beginning of the program he hardly spoke, isolating himself from his peers. By the end, though his English was still imperfect, he had become quite gregarious. He was engaged with his cohort, and would talk enthusiastically about the

project and the role he played in it (something that might not have happened in an individual project). His parents attributed much of his growth to the inspiration he took from the presence of a coach for whom English was also a second language (her native language was Korean).

Another participant in Flint noted a change in her ability to communicate easily with strangers:

*“Like I said earlier, speaking to people, I was more kind of an antisocial person. When I first started, I really didn’t talk to people I don’t know well. I’d have to completely just know you for so long before I’d talk to you. Now I can talk to almost anybody about anything no matter where I am*

*...we went through about 6 projects before we got there. We were trying to help the African American Museum here in Flint get out online and on the Internet, you know, well advertised. We were going to try to work with the Doureghty Park Community house. It’s a little local community house, kind of like a latch key program for the kids. We went through so many different things to the point where I had to start mixing and mingling with many different people in different settings. So that helped me, because like I said I was antisocial; I really didn’t talk. I had to learn how to talk to people, because of the different projects we were trying to do before we set out on that.*

Coaches and Flint Public Library staff also noticed an apparent growth in self-confidence and motivation. At the final focus group, one student in indicating what she had learned said:

“Usually I’m not the type to do something and sit down and get finished. You know, when I read books, I read half and then put it somewhere. Bake half a cake, you know. (laughter) and I said I’m going to do this. I was so happy when I finished it. I was like, wow that’s mine.”

Teenagers in Flint also developed new expectations about the working world. In a post-program feedback session, one young man expressed excitement at the realization that a job could be challenging and enjoyable, and observed that working for the library must be like having a white-collar job. Though some of his peers laughed at first, his passion and his conviction proved persuasive, and the whole group soon acknowledged his point. A conversation between a young woman in the program and her boyfriend provided another example of the apparent satisfaction the teenagers took from their work. One day, the young man showed up at the library and asked the woman to leave with him. She refused, to the delight of the coaches, by explaining, “I’m a working woman.”

### 6.5.1 Lessons

- Self-presentation skills can be built into the program. The Flint model had self-presentation opportunities built into both years of the program. Twice during each semester students were able to present to their parents, their community organization,

and each other what they had done. These were public presentation opportunities. Along the way students practiced their presentations. At the end of the program planners created an event that included public presentations by all participants with the youth mentors serving as emcees. For a few of the students there were additional public presentation opportunities. Because the Flint program was well publicized in the community, several students were seen on local television. At the end of the program each year two students went to western Michigan to publicly show their skills, through programs arranged by the W.K. Kellogg Foundation.

- The teenagers' long-term behaviors suggested that they looked to the coaches as role models, though this was not always obvious in individual interactions.
- Don't give up. Progress was rarely obvious, with most improvements only becoming visible toward the end of the year.

## **6.6 Political engagement**

Though we expected that some of the community projects would have political overtones, we did not expect to see significant increases in political engagement over the course of several months. We anticipated that the most important effects would only be apparent later in the teenagers' lives. Therefore, to evaluate this outcome we focused on the teenagers' instrumental involvement in social change projects, which has elsewhere been shown to increase the likelihood of political engagement later in life. As observed above, the projects that the teenagers undertook were not completely successful. In most cases, however, the teenagers did take a leadership role in identifying and working to implement community work. Their work, especially in Flint, earned them recognition and praise within their communities.

In terms of concrete political action, however, the teenagers at the Ann Arbor housing site surprised and impressed us. A few months into the program, the county announced a decision that threatened the funding for the community center out of which the CIO program, along with many others, operated. The teenagers quickly joined fellow community members in a show of support. The group composed a letter to the county commissioners describing the value of the center in their eyes, attended the next commissioners' meeting, and had a representative of their group read the letter aloud during the public portion of the meeting. Following their participation in this session, the coaches felt there was little more that the teens could contribute, and they recommended that the group return to working on the project that had been interrupted by the funding issue. The teenagers, however, rejected this proposal outright. They refused to move on until they had done more in support of the community center. They spent the next few sessions drafting letters to other potential allies. In the end, other sources of funding for the community center were found. Unfortunately, much of the lobbying and bargaining went on behind the scenes and there was no clear point in time to declare victory and to recognize the teenagers' contributions to the effort.

### 6.6.1 *Lessons*

- It is unclear how big a role this program played in motivating immediate political engagement. Perhaps the teenagers in Ann Arbor would have done the same in the program's absence, although the regular meeting time clearly created a forum for organizing this activity. The important lesson for us was that we needed to be flexible. Unexpected, even seemingly harmful events can provide an opportunity for learning and action.

## 6.7 **Unplanned benefits**

### 6.7.1 *Teen exposure to university community*

Teens in the first year of the program had two opportunities to visit the University of Michigan. In November they came to the campus to participate in a daylong workshop focused on teen activism, after which coaches gave them a tour of the Ann Arbor campus. Participants were invited back in April to participate in the School of Information's once-a-semester student showcase. The teenagers presented their work, side-by-side with SI graduate students, to an audience that included students, SI faculty, and information professionals. At the end of the day, the teenagers spoke enthusiastically about the compliments they had received, about the other projects at the event, and about SI. Afterward, a number of faculty members approached the coaches, conveying their admiration for the teenagers' work, and their self-presentation.

Another form of university exposure was the regular contact that the teenagers had with graduate students. Many of the participants took the opportunity to ask about college life, college classes, and the application process. And some claimed to have decided that they wanted to attend the University of Michigan. Again, it is impossible to say how much this was due to the exposure afforded by the program, but we do believe the experiences played a part.

### 6.7.2 *Personal growth for coaching staff*

Though influencing coaches was not among our initial objectives, many of them reported being deeply affected by their experiences. The coaching role was hugely demanding, requiring more time and energy than anyone, including the program designer, anticipated. The coaches reported feeling exhausted after most sessions. They were working in communities unlike most that they had known before, with teenagers whose trust they had to earn over the course of several months. Their reward was getting to know people whose life experiences were, for the most part, very different than their own, and glimpsing some of the frustrations of working in underserved communities. The coaches' journals and the way they talked about the program suggest that the experience shaped their perspective on the world in ways both small and large. One coach even indicated that her decision to become a youth librarian was due in large part to the program and the skill and dedication of the FPL staff, while another has gone on to work in youth services at an urban public library. The two coaches from the Flint program's second year, though still students, are both active in a number of community-related projects. Finally, the project manager is developing a dissertation examining the use of

information technologies by social movement organizations.

### *6.7.3 National dissemination*

Finally, the program received regionally, national, and international recognition, allowing us to share our success and our lessons. (See section 7.6.)

## **7 Other implementation lessons**

### **7.1 Coaches**

The role of the coaches, as originally conceived, was to provide mentorship and guidance to the teenage participants. They were responsible for teaching technical skills on one extreme, and for helping the teenagers design and implement community projects at the other. Working with teenagers presented numerous challenges. Coaches in the first year were responsible for discipline, motivation, inspiration, and guidance of teenagers whose life experiences were very different than their own. As already observed, this was a huge responsibility, even though the coaches had significant support from librarians in Flint and youth development workers in Ann Arbor.

To fill this demanding role, coaches were recruited from across the university campus; however, graduate students in the School of Information ultimately held the majority of the coaching positions. Though thoroughly committed and technically skilled, these individuals generally lacked training for and experience with working with teens in underserved communities. The coaches were frequently frustrated and uncertain about their role. Given this limitation, the coaches were tremendously successful. They learned on the fly, and helped the teenagers achieve a number of successes. Nonetheless, project leaders concluded that SI students' greatest strength lies in their ability to understand, explain, and apply information technologies in real world settings. Based on this conclusion, we decided to revise the role of the coaches in the future.

Testing our thinking, the role of coaches for the second year of the Flint program emphasized technical consulting and teaching. The coaches helped the teenagers collect, organize, and present materials in a clear and compelling fashion. The coaches' experiences during the second year suggest that the revised role was a better fit. They reported fewer challenges, appeared more confident, and were very successful according to librarians and participants.

### **7.2 Community partners**

Collaboration always has problematic aspects, but no other mechanism permits the development of this type of program. Our community partners were invaluable. Without them, establishing the program in the community would have been much more difficult. Our partners, both in Ann Arbor and in Flint, provided valuable insight into their communities, they afforded a sense of legitimacy, and they enable access to otherwise unavailable communications channels. We could not have been as successful as we were without them.

Though justified by the benefits, coordination with our partners was difficult. Each member of the project team brought different schedules, responsibilities, and priorities to the table. We quickly discovered that though we started from a common set of objectives and plans, differences emerged in execution. These were often the result of the issues that would arise in the field, where abstract plan met concrete action. The coaches' communication role was particularly demanding, being located as they were at the center of the program activities. Most troubling, they sometimes found that the expectations of the project leadership at SI and those of our partner organizations were inconsistent. In order to resolve the tension that resulted, the SI planning team initiated bi-weekly phone calls with SAC and FPL, while the coaches arranged to meet on site with the other staff as often as every week.

### 7.3 Teen incentives

Incentives for the teenage participants, particularly the issue of pay, proved to be a complex issue. As previously noted, the pay structure was different at the three sites. In Flint teenagers were paid by the hour. The Ann Arbor housing site participants received a stipend. The Ann Arbor teen business developers earned money only when they found paying customers. As it turned out, the program staff at the three sites also had different expectations about the role of the financial incentive.

First, there was debate regarding the teenagers' role. Were they employees, or students in a service learning program? The answer to this question influenced the attitude taken toward the teenagers' contributions. When the program was seen as a job, teenagers were expected to "work for their money". When seen as a service learning experience, the goal was to identify projects that the teens were themselves motivated to pursue.

In Flint, the strategy used by the FPL staff was to present participation in the program as a "job" (probably because they had successfully employed this motivator in past programs requiring participation over an extended time). The money was seen as a key motivator, and the librarians were quick to remind teens that they had to work because they were being paid. The first year coaches were less inclined to adopt this tactic, which likely reflected hesitancy on the part of their supervisor initially to abandon the service learning approach. These differing attitudes created tension, though ultimately, the Flint program fully embraced the job perspective. Participants in the second year Flint program were asked about this aspect of the program during the final focus group. The responses indicated that the students—at least at the beginning—joined the program because they were being paid to perform.

*"Most people if you say they ain't going to be money they like forget about it. But when you think about what you can get out of it, then you think twice about it. Colleges and things you think well dang I could use that. I could take advantage of that."*

*"At first, it was kind of iffy, but I went through it and went yeah I would do it without money."*

At the Ann Arbor public housing site, the debate between job and service learning was

between coaches. At least one of the coaches felt very strongly that the teenagers needed to learn job skills. The other coaches were less expressive about their opinions. The Ann Arbor program ultimately tied pay to attendance, and attempted to introduce some performance bonuses.

There is evidence, however, that the employment model in the Ann Arbor public housing site created tension. Participants complained they were being cheated out of pay, they attempted to “get away” with doing as little as possible, and they actively resisted their coaches, who became their bosses. A grounded theory analysis completed after the program finished suggests that the more the program resembled a job, the more the teens in the public housing site resisted it.

#### **7.4 Working with information technology**

Information technology was a central feature of this program, and demonstrating its potential benefits in underserved communities was our aim. While we believe that we have identified some possibilities, our experiences with this program are a reminder that working with information technologies is always a challenge, and maintaining a computer lab takes significant resources.

The Ann Arbor public housing site had very little information technology. We found it necessary to move stand-alone computers to a more conducive location, install telephone lines, and ready the computers for the Internet. Lack of a stable information technology environment and lack of staff able to trouble-shoot proved to be a barrier to sustainability.

On the other hand, the Flint Public Library had an ongoing computer lab, staffed by a professional. This lab was initially developed in 1995 with assistance from the W. K. Kellogg Foundation, Apple Computer, the University of Michigan School of Information, and state funds.

The lab consists entirely of Macintosh computers running Mac OS 9.1 and a Macintosh G3 file server. The machines have between 216M and 320M of RAM. They are connected via 100 Base-T Ethernet and are connected to the library’s T-1 line through an Internet server that serves the entire library system.

The teaching area of the lab has an instructor machine (Power Macintosh G3 desktop) and 13 iMacs, 8 of which are “first generation” iMacs with 233MHz processors and 5 of which are “second generation” iMacs at 350 MHz. A corner of the lab is used for scanning and working on multimedia projects. This corner has a Power Macintosh G3 desktop and three iMac DVD’s with 400 MHz processors and Firewire ports. Other equipment in the lab includes: scanners, external drives, printers, and a variety of website development software, digital cameras, projectors, etc.

About half the iMacs were acquired midway through the first year. The equipment used before that, then five years old, was unstable and periodically locked up, causing problems for class instruction and frustration among participants and coaches.

At the Ann Arbor public housing site, the problem was even more pronounced. A small lab was located in the community center when the program arrived, but it could not

accommodate the number of participants. This problem was resolved by moving the lab to the basement of the center, where it had room to grow, but many other problems followed. Power to the community center failed on several occasions, and the power utility was slow to respond. Environmental factors, like the irregular power supply and large temperature fluctuations in the space, likely contributed to the failure of some of the older hardware. Phone service, paid for by the community center and used to provide Internet access, was cut off because of confusion regarding the telephone bill.

In short, coaches from both sites always faced the prospect that the tools they needed to run a session might be unavailable. We do not believe that these challenges are unique. Even the School of Information, which has a sizable staff dedicated to supporting its computer resources, struggles with unstable information technologies on a regular basis. The problems cannot be completely avoided; instead, programs that depend on technology must be able to operate even when the technologies don't. Thus, it is crucial for researchers who work in a high-end IT environment like the University of Michigan to design projects that do not swamp less sophisticated environments. It is equally crucial for communities to seek the best IT for citizens in order to provide a means for the community to bridge the digital divide.

## **7.5 Sustainability**

The Flint program had library support from the beginning, and the interest and dedication of the library staff was crucial to both its continuation and its redesign. FPL has a track record of providing technology programs for teens dating back to 1994. During these years the library has faced severe budget and organizational problems. In spite of these FPL has found a way to provide programs of this sort, even during times of lay-offs and branch closings.

These are indicators that this program will continue in one form or another. The form it takes will depend on the resources that can be brought to bear and their constraints as well as the continued collaboration activities of FPL.

Though the program in the Ann Arbor public housing site, did not gain sufficient momentum to continue, the Neutral Zone is planning to continue and expand its youth business activities in the coming year.

Complementing the sustainability, the dissemination of information about the program and its successes more broadly increases the likelihood of replication. As a result, the program design can continue to evolve even if this program ends.

## **7.6 Dissemination**

Our work with this program is being disseminated through a variety of channels reaching several different audiences. First, we received coverage in the popular press. Most notably, the CIO program was featured in a *Family PC* article on teen technology programs. The program also received coverage in the local news media, with an article appearing in the Ann Arbor News, and television news coverage in Flint. Second, the program was recognized in professional communities. The Flint program received honorable mention in the American Library Association's publication, *Recognizing*

*Excellence in Afterschool Programs for Young Adults* (<http://www.ala.org/afterschool/>). Recently it was featured in a presentation at CTCNet (<http://www.ctcnet.org>). The Childrens' Partnership (<http://www.childrenspartnership.org/>) a national non-profit organization that focuses on recognizing excellence in programs in low-income communities has identified this project as one of four it featured on its website. Finally, information about the CIO program is spreading in the academic community. It has been included in an international survey of teen technology programs conducted by Professor Kay Livingston of University of Paisley in Scotland. Kelly Garrett, the research assistant on this grant, has written a paper reporting on some of the lesson learned from the challenges encountered at the Ann Arbor site. He is revising it for eventual journal publication.

## **8 Conclusion**

Our work demonstrates that teenagers can use IT skills to make valuable contributions to their communities. They can collect useful information and present it in a way that adults recognize as valuable. In the process, they can develop social skills, larger social networks, and the ability to form trusting relationships. It seems, however, to be overly ambitious to simultaneously teach technology skills, introduce community development concepts, and integrate the lessons into coherent community projects. Our experiences suggest two promising strategies for future efforts.

The revised program at the FPL and the program at the Neutral Zone exemplify the first strategy. Rather than requiring teenagers to find a community audience and design projects responsive to their needs, the program staff specifies the project. Such an assignment puts teenagers in contact with community members, while prescribing the general shape of the computer-supported product. Participants learn about community work by using newly acquired technical skills to engage in a well-defined project with a good probability of success. It avoids the difficulties associated with asking teenagers to identify a community audience and understand its needs. One negative consequence of the strategy, however, is that the teenagers do not get to pursue a project of their own choosing, and, as a result, may have less self-motivation for the work. Nonetheless, the strategy does provide teenagers a first-hand experience of integrating information technology skills with community development. Our experience in Flint and at the Neutral Zone suggests that this can be an effective strategy in some circumstances, although we do not yet have enough experience to characterize all the circumstances in which it is likely to be most successful.

The second strategy places greater emphasis on teen-led community change. There are a number of programs in operation today that encourage teenagers to pursue community projects that reflect their own interests and concerns. Perhaps the most notable is the Public Achievement program developed at the University of Minnesota, some of whose materials we borrowed. These programs support the teenagers' work by providing them with tools for thinking about and creating change. Information technology skills could be valuable additions to this tool set. For example, the staff of an existing program might

invite a technology consultant (a variation on our coaches) to help teenagers design computing resources supporting their initiatives. The consultant could also provide the teenagers with the training required to implement and use such resources. Again, teenagers would experience first hand the integration of computing technologies and community development. We were not as successful with our attempts to implement this strategy, although we are still hopeful that it can be effective in other circumstances. We believe that one helpful ingredient would be a large set of concrete examples of previous community change projects that involved effective use of technology. As such examples begin to accumulate it may be easier to coach youth in formulating their projects.

## *Appendices*

### A. Surveys