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Closing the Gap: Enhancing Technology Programming for Youth in North Minneapolis

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FINAL REPORT

Closing the Gap:
Enhancing Technology Programming for Youth in North Minneapolis

Alternatives Program Applied Research Project Final Report

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Closing the Gap:

Enhanced Technology Programming for Youth

Introduction

A technology divide persists in the United States. Recent studies have shown that young people of color, low-income individuals, and women are still underrepresented in science, technology, engineering, and math (STEM) careers and career training programs (NSF, 2003). Young people of color face several barriers for entry into STEM related careers including lack of role models and networking, information gap along with digital divide, perception of IT as a while male career, and lack of commitment from practice and the academy to recruit and work to retain young people of color in STEM related fields of study (Payton, 2004). Alternatives aims to respond to this gap and to assist young people of color to break down the barriers.

This final report documents the findings, conclusions, and recommendations of an applied research project into STEM based programming. The report is organized into four main sections. The first presents an overview of the issue Alternatives aims to address, namely the technology gap among urban youth of color. The second major section provides an overall description of Alternatives, one of a very few youth programs focused on technology capacity building in North Minneapolis. The third section crafts a programmatic description based on scholarly and research evidence. The final section offers Alternatives conclusions and recommendations based on a comparison of its program to the research-based program. This applied research project aims to open up conversations on how Alternatives can provide the best program given available resources.

Project Summary

This applied research project began during the summer of 2008, with most data being collected by September 2008. Analysis of data occurred between August and November 2008 and the final report was completed by March 2009. The data collection included:

- Conversations with paid staff of youth organizations in North Minneapolis to explore the extent and focus of STEM related youth programming in the area;
- A thorough literature review of STEM programming and youth of color;
- Review of internal Alternatives documents, including grant proposals, program descriptions, and other PR materials;
- Interviews with youth participants at Alternatives;
- Participant observation of the programs at Alternatives.

Data was analyzed for themes and then compared to research and evaluation recommendations as documented in the literature, with the overall goal of creating a logic model for Alternatives. This report provides two logic models, one based on research findings and the other based on the research conducted on Alternatives. The report concludes by comparing the two models and suggesting recommendations for Alternatives to enhance and deepen its technology focused programming for young people in North Minneapolis.

Limitations

This project has several limitations. First, the project did not set out to provide a comprehensive assessment of youth programs in North Minneapolis. The aim was to survey programs in and around Alternatives to ascertain to what extent they offered unique programming for youth. This survey was limited due to time and accessibility of key informants during the summer months. As a result, we talked with only three of other youth programs

(North YMCA, Plymouth Youth Center, Science Museum of Minnesota, Kitty Andersen Youth Science Center). The findings related to the uniqueness of Alternatives relative to other local programming should be understood as preliminary.

Second, the time spent observing Alternatives programming was limited to the summer months with several programmatic elements in preparation or recently completed and therefore unobservable. The information that was gained on Alternatives is not indicative of its full range of programmatic offerings. Even during this review period, Alternatives was in the process of building a sound studio and had just finished a robotics program. These could not be observed and are only anecdotally included.

Technology and Achievement Gap

Nationwide, low income, high crime neighborhoods and schools are disproportionately composed of families of color, generating an ever-widening academic and technology gap for students of color. On the whole, students in the Near North neighborhoods of Minneapolis, like those in other low income, high crime, high unemployment neighborhoods around the country, have fallen academically behind their peers in other, safer, more affluent Minneapolis neighborhoods. Public school funding cuts and a focus on standardized testing leave teachers with fewer options for creatively reaching out to students with varied learning styles and diverse backgrounds. Furthermore, because of decreased funding, computers and other technology are too often unavailable, out of date or underutilized in schools, especially schools in poor neighborhoods. Lack of skills, experience and interest in science and technology persist among young people of color, low-income students and young women, which only exacerbates the difficulties faced by students whose schools lack resources to promote engagement in sciences

and technology (NSF, 2003). Numerous reports describe a significant technology gap for low-income, urban and minority youth (Fazarro, 1999; Pearson, 2001; NSF, 2003).

Northside community

Young people in North Minneapolis are underserved not only in their schools but also in their neighborhoods. According to the City of Minneapolis "neighborhood profile" statistics from the 2000 census, people in the Near North neighborhoods of Harrison, Hawthorne, Jordan, Near North and Willard Hay experience more unemployment, higher poverty (including in families with children 18 and under), lower income, lower home values and more vacancies than the city-wide averages. This community is made up of more people of color than the city at large as well (City of Minneapolis, 2000). Individuals and families in these communities are working to meet their basic needs and are therefore, in spite of the clear need, less able to provide enrichment opportunities for young people.

Just outside of the Near North community to the north and west, the Camden neighborhoods of Cleveland, Folwell, Lind-Bohanon, McKinley, Shingle Creek, Victory, and Webber-Camden have been changing over the past decade or two. These neighborhoods border suburbs such as Robbinsdale and Brooklyn Center. Twenty years ago, these neighborhoods resembled their suburban neighbors, but are beginning to look more like the Near North community (City of Minneapolis, 2000). In 2006, according to the Minneapolis Police Department's "Homicide Summary," 48% of homicides took place in the 4th precinct, which includes the communities of Near North and Camden. In addition, the report found that 56% of the victims and 48% of the suspects were Black males (Hayhoe, Knox & Tremmel, 2006). More and more the Near North and Camden communities are struggling to effectively and positively engage youth outside of school both in homes as well as through community programming.

These statistics paint a bleak picture of the future prospects of young people in the Near North and, increasingly, Camden communities. Many of these youth do not dream of college or careers but anticipate early parenthood, employment difficulties and even incarceration, social realities reflected too often in their families and neighbors. Furthermore, even when their families and neighbors indicate a more optimistic future of job security and furthered education, research suggests that these dreams do not include the highest paying jobs in science and technology (Pearson, 2001).

Lack of opportunities

In addition to the limitations presented by the specific challenges in North Minneapolis described above, there has been a shortage of meaningful technology curriculum in schools and programming out of school in Minneapolis and nationwide. While this is changing for in some schools, students in the Near North community still lack access to ongoing, meaningful, integrated science and technology information or accessible mentors and role models. The same is true in similar low income neighborhoods with greater populations of people of color in other metropolitan areas across the country. In fact, for many of these students, finding safe and engaging activities and programs for the out of school hours is challenging. There are few real role models and opportunities for career-focused networking for young people of color. Moreover, these youth often have the perception that careers in science and technology are for white men or that they do not have the technology background to pursue such careers (Pearson, 2001). Young people in North Minneapolis need opportunities to connect with caring, knowledgeable mentors in all of their interest areas, as well as to be introduced to and made curious about new avenues of learning such as science and technology-based activities. The

Alternatives Program, which serves youth in the Near North neighborhoods, offers young people mentoring, instruction and exploration into science and technology.

Alternatives Program Logic Model

This section provides a description of Alternatives. It begins with a brief introduction to Alternatives and then provides a logic model description. A logic model provides a way to describe the programs theory (Mattessich, 2003). This conceptual tool will be used to describe both Alternatives and the scholarly based program theory provided in the next section. The data used to build this model of Alternatives comes from three primary sources: review of relevant documents from Alternatives, observations of the program, and interviews with youth participants.

Program Mission and Overview

Alternatives' mission is "to provide positive programs to urban youth of promise (including youth who have already encountered the judicial system) aged 9 to 19 years old, with special emphasis in the North Minneapolis area, in order to support and guide them to fulfilling, productive and successful adult lives." This mission is put into practice through providing a wide range of activities for local youth ranging from computer skill training to physical wellness and tutoring. It focuses on the whole person through providing programs in several distinct areas: computer skill building, academic support and enrichment, personal development, physical health, and basic needs.

Program Logic Model

A program logic model includes four categories and how each of these connects to each other. These four categories include:

- Inputs: what does a program need to carry out its activities? Examples from Alternatives includes: bicycles, computers, staff, food, robotic kits, volunteers and money.
- Activities: what goes on in the program? What do the staff and volunteer do? Examples from Alternatives include: computer skill training, mentoring, tutoring, support groups.
- Outputs: what is accomplished through these activities? Examples from Alternatives include: completed homework assignments, software training completed, number of youth matched with mentors.
- Outcomes: what is changed as a result of accomplishments? Examples from Alternatives include: meaningful connection with software, improved computer skills especially around business based applications.

Creating a clear program logic model for Alternatives comes with challenges. In its attempt to offer a wide range of activities to meet the needs of an increasingly diverse youth population in North Minneapolis, it has many activities in common with other youth drop-in centers in the area, while at the same time is trying to create a unique opportunity for youth participants.

Although most of the programming at Alternatives is typical of community youth centers, the combination of activities the organization provides is unique and innovative. As is common with community youth centers, Alternatives offers adult-organized programming, as opposed to youth participatory approaches (Delgado & Staples, 2008; Driskell, 2002). Staff and adult volunteers are the primary resources for the overall program and currently a crucial input required for the program to function well. Currently, Alternatives relies heavily on volunteers and donations of all kinds. Raising the necessary resources for programming is a major concern and currently occupies a significant portion of administration and leadership time and effort. Other programmatic requirements are also similar resources as other youth centers: volunteers,

building, supplies, and funds for travel and site admissions. Likewise, it supports activities that can be found at most other youth centers: drop-in tutoring for students, mentoring opportunities, support groups, interest-based activities and field trips. These ordinary program features are united with computer skill training, media exploration and clothing and food donations. While Alternatives contains some innovative elements, the program activities are not unified around technology.

Without a unique activity offering, its outputs (e.g. what it can immediately accomplish) are also similar to other youth programs. Other youth centers have claimed similar accomplishments; some with better results. For example, the North YMCA might have an advantage in providing physical health activities and creating high quality outputs related to young people's physical well-being and physical fitness. Nonetheless, Alternatives aims to achieve a wide array of immediate and long-term outcomes including an emphasis on computer literacy and computer skill building, providing unique opportunities for youth on the Northside. Currently Alternatives aims to be many things for the young people who participate in its programs. The outcomes range from creating meaningful connections with caring adults to computer knowledge and skills to decreased criminal activity and recidivism. These seemingly disparate goals can be read both positively, as attempts to meet the needs of youth participants, or negatively, as lacking clear focus or purpose.

This analysis of Alternatives is not meant to be exhaustive or complete. It is possible that particular aspects of the agency were missed. We have, however, developed a thorough understanding of its program theory: in its current organization, Alternatives aims to provide whatever service and support young people need while also trying to build young people's capacity in technology. Because of this wide focus, the technology based programming is often

described as an additional set of activities rather than the main focus and primary service Alternative provides to youth in North Minneapolis.

Alternatives Program Logic Model

Inputs	Activities	Outputs	Outcomes
Youth Staff Volunteers Mentors Bikes Youth Staff Facility space Computers Software Supplies (e.g. Robotic kit) Food Clothing	Computer Skills Training: Mavis Beacon	Every participant completes 30 minutes of training per visit	Meaningful connection with the software Improved attitude toward school and engagement in learning Development of computer skills
	Media Exploration: movie night media-specific software	Number of movie nights per month Number of media-related products created through use of media specific software	Improved critical thinking about media Increased ability to express self in writing and through art.
	Free time using Microsoft word and internet	Daily exposure to computers.	Development of computer skills Improved attitude toward school and engagement in learning
	Tutoring	Complete homework on time	Timely educational progress
	Mentoring	Exploration of post secondary education Educational attainment	Acceptance to post secondary institution High school graduation
	Girls support groups	Ongoing attendance by female participants.	Increased confidence Provide a safe space to discuss pressing issues
	Interest Classes (Robotics, dance, chess, art)	Completed project related to science or other interests	Increased skill in use of science concepts and tools
	Physical exercise	Bicycle trips completed in summer time Weekly exercise class	Healthy living Physical fitness
	Field trips	Visits to community, educational and sport events and agencies	Expanding understanding opportunities
	Food and clothing donations	Young people participating receive free meal Basic needs are met	Reduce involvement in criminal and illicit activities

Research Based Youth Technology Programs Logic Model

Staff and volunteers at Alternatives work hard to create a safe, engaging space and meaningful, fun and educational science and technology out of school programs for young people in North Minneapolis. Unfortunately, there are too few such programs in these neighborhoods and across the nation. Moreover, staff have little guidance on how to best organize, plan and facilitate such programs because, although there are abundant studies and reports on after-school activities in general and academic and enrichment programs specifically (such as sports, theater, dance, etc.), little research has focused on after-school science, technology, engineering and mathematics (STEM) programs. While STEM programs are emerging in urban centers nationwide and several authors acknowledge the importance of creating and evaluating STEM programs, it remains surprisingly difficult to locate existing research and evaluations (Fazarro, 1999; Pearson, 2001; NSF, 2003).

STEM content in out of school programming

In an initial review of after-school programming literature, we found it to be largely dominated by reports on mentoring programs for youth labeled “at risk.” While some specific academic and enrichment programs have shown varying degrees of academic, social or relational successes, integrative, well-implemented mentoring programs have yielded stronger and more comprehensive positive outcomes for “at risk” young people. For mentoring programs, being “at risk” due to environmental challenges (i.e. living in poverty, unsafe neighborhoods, living in a single-parent household) was more predictive of successful outcome than personal challenges (i.e. learning difficulties) (Du Bois, Holloway, Valentine & Cooper, 1997). In their meta-analysis, DuBois, Holloway, Valentine and Cooper (1997) linked mentoring to positive effects that went beyond the mentoring period and showed a correlation between mentoring and

prevention of antisocial behaviors. Furthermore, formalized mentoring programs produced similar positive results to "natural" (familial) mentor relationships (DuBois, et al., 1997). Successful implementation for formal mentor programs includes initial and ongoing training for mentors; a balance between structured and unstructured activities (Reno, Pederson, Weinig & Riley, 1998; Elliot, Hamburg, & Williams, 1998; Kugler, 2001); opportunities for relationship building (Hirsch, 2005); consistent and prolonged meeting times (Grossman & Tierney, 1998); and clear program goals and strong management/leadership (Reno, et al., 1998; Elliot, Hamburg, & Williams, 1998). The notable positive effects of mentoring programs lends credence to the importance of relationship-building in youth programming that can be applied to many types of relationships between caring adults and young people.

Relationship building emerged from the literature as the most important element of after school programming. Strong ties among youth, and between youth and adults, proved to be *the* dominant element of successful after-school programming and were even more powerful factors for urban youth than previously thought. For youth considered "at risk" due to their living environments, having a positive, consistent relationship with a trusted adult was shown to support positive self-esteem and increase learning and academic success in both girls and boys (Hirsch, 2005). Although relationships can emerge from any type of after-school programming, deliberate mentorship as part of an out-of-school time program provides the most structure to support ongoing relationship building. Mentors who receive comprehensive, on-going training and have time to engage in both structured (tutoring, enrichment) and unstructured (talking about family, school, interests or just playing) activities are most effective with urban youth, especially those from "the most violent neighborhoods" (Hirsch, 2005).

One promising application of these findings would be to integrate STEM content and activities into after-school mentorship programs. Kugler (2001) found that combining technology and one-on-one tutoring generated increased positive results over either activity alone. Mentorship literature suggests that positive relationships with caring adults are more positive than tutoring or other volunteer connections alone. As reflected in the literature, recruiting and training peer or adult volunteer mentors to work with young participants in the Alternatives program would not only strengthen the buy-in for STEM-related learning but also engage Northside youth in ongoing relationships with positive role models. Adults working in STEM-related fields, college and university students with STEM-related majors, and high school students interested in STEM could act as mentors for students both around general life issues as well as on projects and activities related to science and technology (Adams, 2006).

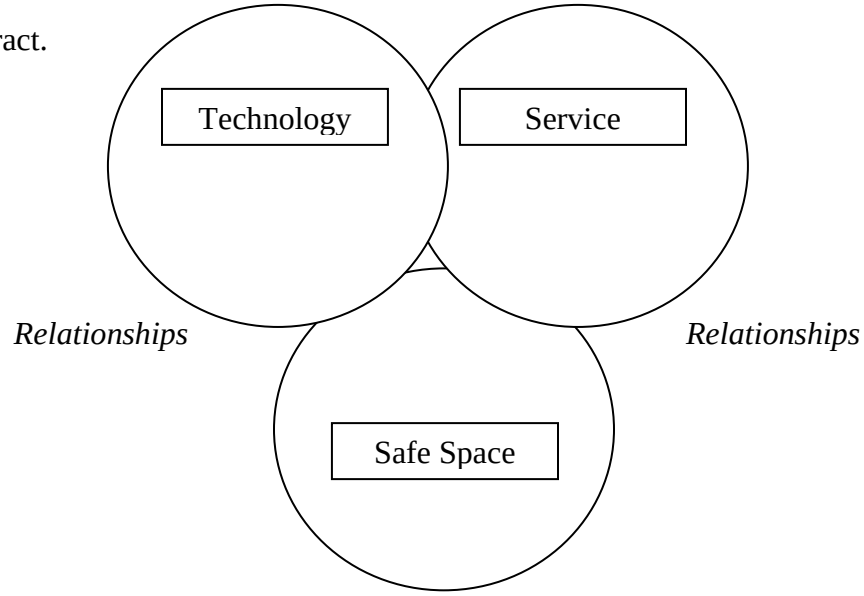
Ideally, the mentors would reflect the youth participants and would be from a diversity of racial, ethnic, religious and class backgrounds as well as a balance of male and female tutors. Lastly, an effective program would include a family engagement component. Family participation can help build community, solidify youth relationships with mentors and the program and reinforce the learning that happens at the program (Connell & Gambone, 2004). Family engagement could include open houses, technology classes for parents, parents acting as volunteers or simply staff and mentors connecting and communicating with parents and families.

In Ann Arbor, Michigan, young people ran Youth Owned Records (YOR) with the help of staff at an already thriving youth center. Those involved in YOR managed and operated a music production company, producing “professional-quality recordings, a youth musicians’ network, and space to connect with adult musicians” (Pittman, Irby, Yohalem &Wilson-Ahlstrom, 2004; p. 33). Through participation in this program, young people were exposed to

mentors and role models in their field of interest. In addition, they gained technology, business, management and marketing skills. This program successfully and authentically integrated STEM content into out of school programming.

The model

After reviewing the literature, a new model of best practice for out of school STEM programming emerged. Three programmatic elements surfaced as the most important for successful STEM-based out of school programs: (community) service, safe space and technology. These three are not rank-ordered for hierarchy. Instead, they should all be considered equally important to the success of a program. The diagram below illustrates how these three elements interact.



The darkened place where the three elements overlap represents best practice based on the literature. This indicates that ideally, equal parts technology, (community) service and safe space result in the most successful program for young people. Furthermore, as indicated in the literature, relationships have proven an essential component of successful youth programs. An overall attention to relationship building between youth and adults as well as among youth participants is integrated into the three programmatic elements of service, technology and safe

space. Essentially the programmatic elements are embedded in a system and culture that prioritizes and nurtures relationships. By starting with relationships, young people are able to feel safe, serve their community and acquire technology skills.

In addition to this new framework for best practice in out of school STEM programming, the following chart is a logic model that delineates an ‘ideal’ form based on the literature on out of school programs as well as technology programs. It illustrates what a program/agency needs to provide (inputs), the important elements to run the program (activities), the specific programmatic elements that participants and/or program staff produce (outputs) and the short-term, intermediate and long-term outcomes that would be expected from ongoing participation in the program. While this is an example and the specific numbers and activities could change, it serves as a research-based model of a comprehensive program with positive, measureable outcomes with various time frames.

Research/ Practice-based Technology Program Logic Model

Inputs	Activities	Outputs	Outcomes
Staff Space	Check-in	Attendance: Frequency (2x/week) Length (1 hour/time) 15-20 minute/time small group or individual check-in (formal or informal)	Short: Relationships – emphasis on ELD topics: Ask kids "how are you?" and listen Mid: Trust, comfort, safety, honesty, commitment, increased individualized care Long: Confidant – kids have someone to come to when big decisions need to be made or they succeed/fail = lifelong support
Technology equipment as related to activity	Emphasis on STEM skill-building through participation (e.g. sports, dance, theater, robotics, sound studio)	Attendance: 2 hours/week x at least 15 weeks Technology-related progress (focus and movement) Public performance/presentation (community/family night)	Short: Increase interest, confidence and familiarity in technology Beginning understanding Technology career exploration Mid: Increased understanding around tech Increased capacity to use tech Long: Secondary and post-secondary exploration/commitment Career exploration

Peer educators Training	Peer-to-peer education	Technology-related project progress	Short: Peer-to-peer mentoring relationships Increase confidence and interest Increased understanding and familiarity in tech Mid: Capacity to teach others Increased capacity to use tech Small group facilitation Increased understanding of neighborhood and needs Community service Long: Career exploration in STEM and/or teaching fields
Guest speakers Transportation	Technology-related guest speakers (with toys) and field trips	4 guest speakers/year 8 field trips/year	Short: Career exploration Mid: Educational exploration/planning Internships Long: Complete education Employed in tech fields

Findings

In this section we turn to synthesizing what has been learned in the applied research study. We highlight several important findings that emerge from the study and provide support for the recommendations we provide next.

The applied research project suggests:

- A technology gap does exist, especially among the population Alternatives serves.
- No other youth programs in North Minneapolis focus primarily on technology.
- Young people in urban environments would benefit from expanded after school and enrichment science, technology, engineering, and math (STEM) offerings.
- Integrating technology skill building, service, safe space and relationships is supported as an appropriate model for a high quality technology focused youth center.
- Currently, Alternatives does not necessarily offer a unique blend or focus of programming for youth in North Minneapolis. While it does provide computer skill training, this might be inadequate alone for Alternatives to be called a technology focused youth agency.
- Alternatives, Inc. has piloted at least one innovative use of technology, the robotics program. This program is an example of what the literature would suggest to be high quality technology-based youth programming.
- Alternatives appears to be an agency providing an wide array of activities often emerging from expressed needs of young people (e.g. food and clothing donations). It fails to provide a clear and articulate vision for the overall agency and to connect the diverse set of activities it provides.

Recommendations

This applied research project suggests several action steps. . Alternatives attracts and retains the target population that would benefit from a technology focused youth agency in North Minneapolis. Below are several recommendations for how the results of applied research project can be translated into practice.

1. **Alternatives should realign programming activities within a technology focus**. No other agency in North Minneapolis is supporting a technology focused youth center for out of school time. Research suggests this would fulfill a genuine need and set Alternatives apart from other youth centers in the area. By framing all of its activities as technology capacity building for youth, Alternatives could provide a valuable and needed resource not only to young people in North Minneapolis but also to the other local youth agencies within a mile of Alternatives. The following outlines examples of programmatic realignment based on the literature:
    - Mentoring: The literature has established that one of the challenges for African American youth to participate in STEM programming is a lack of visible mentors doing this work. Alternatives might develop a mentoring program for area youth that connects them either in group or individually with a professional working in a STEM career. This matching would allow the youth to begin to imagine possible future careers making relevant technology programming.
    - Girls Support Group: The literature has also established that young women also face significant challenges to entering STEM careers. This suggests the need for a

support group around future careers and education, breaking down stereotypes and false images of particular careers as male or white.

- Field Trips: Field trips could remain diverse as long as attention is given to how technology is a part of each location the young people visit. For example, one could consider attending a Timberwolves game and meeting with the technical staff at the Target Center to learn about what they do and what education they needed to be eligible for these careers (e.g. lighting technicians, computer systems, etc.).

  This would open up interesting possibilities for partnering with other agencies, often a requirement for funding from foundations and governmental sources. As it aspires to become a technology-focused youth space, Alternatives will be faced with difficult decisions about which activities to keep.

2. **Alternatives should consider a progressive model of technology focused youth programming, allowing youth participants to continually expand their technology capacities**. Currently, all participants are required to complete 30 minutes of keyboarding. It is clearly important for young people to master this skill, but many participants in Alternatives do not see a clear use for this skill outside of school. We suggest creating an agency model in which young people can move both horizontally through various technology related activities and advance vertically to more advanced skill levels. For example, new youth members may have to complete a minimum of 30 minutes of keyboarding over the course of 30 days. Upon completing this, they can have the options of participating in more creative technology based programming, such as the robotics program or other opportunities that require them creatively applying their STEM

skills in the real world. This could range from sound studio recording to web design. Activities that have a real product that the young people can share with the larger community. Providing both an incentive for completing the mandatory keyboarding *and* an outlet for how they might use their newly developed skill in activities outside of school supports current research into best practices for technology youth programming.

3. **This progressive model includes providing a way for young people to put their advanced capacity in technology to use for the community or other agencies.** Alternatives might explore how young people can provide a valuable resource to the community once they have developed technology skills, such as developing web sites for local community organizations, publishing an online magazine, e-zines, for the local community or for local youth, assisting local community organizations in marketing their events to local youth, etc.

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