Harvard Family Research Project
Harvard Graduate School of Education

OUT-OF-SCHOOL TIME EVALUATION SNAPSHOT

Harnessing Technology in Out-of-School Time Settings

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Harvard Family Research Project's series of Out-of-School Time Evaluation Snapshots *distills the wealth of information compiled in our Out-of-School Time Program Evaluation Database and Bibliography into a single report. Each* Snapshot *examines a specific aspect of out-of-school time (OST) evaluation. This* Snapshot *reviews the role of technology in OST programs, highlighting the evaluation methods and findings about implementation and youth outcomes.*

For youth in the 21st century, aptitude with technology is a critical skill and a way of life. Computers, the Internet, and multimedia tools pervade popular culture and many educational settings. Their use will likely continue to grow in importance in preparing youth for success in the workplace. In this context, out-of-school time (OST) programs can serve as important settings for youth to gain exposure to and knowledge of technology skills—as well as enjoyment, engagement, and other benefits derived from using technology.

National studies show that a large percentage of youth have access to computers and the Internet through locations outside the home, such as schools, public libraries, and community centers.[1] Though such settings may provide access to technology for those on the disadvantaged end of the "digital divide"—that is, youth from low income and minority families, who are less likely to have access to technology in their homes—so far, very little research has explored questions about the ways in which technology is used specifically in OST settings.[2] Since low-income and minority youth are less likely than their peers to have access to technology in their homes, it is critical to understand what role technology is playing in youth's lives in settings outside the home—such as OST programs.

This *Snapshot* draws on information from Harvard Family Research Project's (HFRP) ongoing review of OST programs and their evaluations to provide an overview of

Harvard Family Research Project Out-of-School Time Program Evaluation Bibliography

The Harvard Family Research Project (HFRP) Out-of-School Time Program Evaluation Bibliography (www.gse.harvard.edu/hfrp/projects/afterschool/bibliography) contains citations for all the out-of-school time (OST) program evaluations that HFRP is currently tracking. The bibliography currently contains entries for 315 programs and provides basic program information as well as links to relevant evaluation reports. Some of the evaluations listed in the bibliography have been profiled in more detail and added to our Out-of-School Time Program Evaluation Database, which provides accessible information about OST programs and their previous and current evaluations to support the development of high quality evaluations and programs in the OST field.

Categorization of Programs in the Bibliography

Programs are categorized by program type. Program type can refer to a method of service delivery or a primary program goal. For example, a program promoting health (a program goal) might use recreational activities to achieve this goal (service delivery). The categories are not mutually exclusive, and the categories that are most applicable to a particular program (with a maximum of three, although more may apply) are listed in parentheses following the program description.

The Scan for This Snapshot

For this review, we scanned all program evaluations listed under the program type "Science/Technology/Mathematics." Programs that focused on science or mathematics but did not include a focus on technology were excluded from this analysis. In addition, one report from a program not categorized as "Science/Technology/Math" was included, given a primary focus in the report on the role of technology in the OST program, despite the fact that "Science/Technology/Math" was not among the top three program type categorizations for this program. Using this methodology, 30 evaluation reports of 19 OST programs or initiatives were identified for review. See the appendix for information on the specific programs and evaluations included.

technology-focused programming in the nonschool hours. It culls information from all of the programs and evaluations in HFRP's Out-of-School Time Program Evaluation Bibliography that focus on using technology. Specifically, this *Snapshot* examines how OST programs and initiatives are utilizing technology, how these programs and initiatives are being evaluated, and what implementation and outcomes lessons can be learned from this set of evaluations. In addition, this *Snapshot* illuminates some promising strategies for and challenges to incorporating technology into OST programs.

USING TECHNOLOGY TO SUPPORT LEARNING & DEVELOPMENT

OST programs are natural contexts to support *complementary learning*—that is, the array of nonschool supports that work with schools and other community-based organizations to promote learning and development.[3] Using technology in OST programs is one mechanism for complementary learning in that technology can provide a vehicle for supporting school-day learning. Teachers and parents have used technology such as educational software as a tool for learning during the nonschool hours for many years. OST programs use technology in some of the same ways and in a variety of additional ways. There are four primary approaches that OST programs use to integrate technology into their programs in order to support learning and development:

1. *Using software packages for educational remediation and skill building* – Many OST programs utilize technology to help participating youth with remediation of academic deficits or enhancement of academic skills, primarily through the use of specially designed educational software.

The District of Columbia 21st Century Community Learning Centers, for example, utilize two software programs, one for reading skills and one for math skills, during their summer program. The reading program is for remedial reading, while the math program contains more enrichment activities. Similarly, Fifth Dimension, a program devoted to enhancing the academic preparedness of youth in California, uses computer games and software, such as the Carmen San Diego and Magic School Bus series, to help children master knowledge and academic skills.

2. *Integrating technology and multimedia into project-based learning* – Some OST programs draw on a diverse array of multimedia tools, such as computer games, websites, and digital video, to enhance participants' learning and provide enrichment, often through project-based learning activities.

For instance, in the Discovery Youth program at the San Jose Children's Museum, older youth use multimedia technology, including digital video equipment and video editing software, to create health education materials for younger youth. Likewise, in the South Bay Project, a collaboration of school and community institutions providing after school services to youth in low-performing San Diego schools, youth create simple computer games, electronic portfolios, and multimedia Web pages to learn about computer programming.

3. *Creating community technology centers* – Some OST initiatives provide new or existing programs with technological resources and related peripherals to install technology centers within an OST program.

For example, the Boys & Girls Clubs of America's Project Connect provided Clubs with a diverse array of technological resources—including computers with Microsoft Windows NT operating software, Internet access, laser printers, a digital video camera, a scanner, software programs, and technical support and training—to enhance the existing programming at these sites. Similarly, the Intel Computer Clubhouse Network is an initiative aiming to create over 100 community technology "clubhouses" by providing community centers with 3-D imaging software, digital video recording and editing tools, and music recording and mixing equipment to provide underserved youth with increased access to technology.

4. *Providing technology-focused mentoring and career development opportunities* – Using technology to stimulate interest in science, engineering, and technology-related careers is another approach to integrating technology in OST programs. Often this is done by allowing youth to explore technology in the

SPOTLIGHT on the Martin Luther King, Jr. After-School Program: How One Program Uses Technology

The Martin Luther King, Jr. After-School Program (MLK) is a local community-based program providing middle and high school youth in Dorchester, Massachusetts, with the opportunity to learn technology skills through the study of Afrocentric topics. MLK utilizes the software program Encarta Africana 2000, a CD-ROM encyclopedia on Africa and the African diaspora.

Encarta Africana 2000, released in 1999 and edited by Henry Louis Gates, Jr. and K. Anthony Appiah, exposes youth to content on such subjects as ancient and medieval kingdoms in Africa, the transatlantic slave trade, and the lives of African Americans in the U.S. through the Civil Rights Movement. It consists of an electronic compendium of information about the Black world, with many articles, photos, videos, sound recordings, and other media features on Afrocentric topics, as well as a "library of Black America" containing fully searchable texts of over 100 books written by African and African Americans between 1773 and 1919.

The MLK program also provides participating youth with access to a variety of technology products, including Mavis Beacon Teaches Typing, Roxio Easy CD Creator, Adobe PhotoShop, Microsoft Word, Microsoft PowerPoint, and HTML resources.

context of mentoring relationships with successful adults in such careers.

For instance, the Minority Pre-Engineering Mentor Program provided youth with several weeks of job shadowing at the Boeing Military Airplane Company in order to help them learn how technology is used in the workplace. The Girls Math and Technology Program enlisted professional women as guest speakers to discuss the use of math and technology in their jobs in order to increase girls' interest in related careers.

EVALUATIONS OF TECHNOLOGY-FOCUSED OST PROGRAMS

Evaluation Questions

Although the sample of OST programs and initiatives all use technology in a variety of ways, most evaluations of these programs identified a common set of both formative/process[4] and summative/outcome[5] questions related to their use of technology. Some of the most common formative questions included the following:

- What were the most successful aspects of utilizing technology?
- What were the major challenges and barriers programs faced when implementing technology?
- How did youth experience their interactions with technology (e.g., which aspects did they find useful and engaging and which aspects less so)?

Other formative questions involved the quality of technological equipment and the quality and frequency of technology-related technical assistance.

The majority of summative questions related to the academic and developmental impacts of technology and technology-related programming. A number of evaluations also examined impacts on youth's interest in technology and technology-related careers. The studies of community technology centers tended to ask different summative questions about the impact of technology on sites' programming at large, such as whether the technology impacted youth attendance at more traditional programming and whether technology improved programs' content and efficiency.

SPOTLIGHT on the San Jose Children's Discovery Museum's Discovery Youth: How One Technology Program Was Evaluated

In the 2nd year of **Discovery Youth** (DY), evaluators collected data from youth, staff, and parents to address the following six questions:

1. How has the DY increased the self-confidence of youth participants through the program activities?
2. Have youth built important relationships with their peers and the adult staff?
3. Have youth improved their knowledge of media, technology, project management, and communication?
4. Do youth feel as though they are resources for their community?
5. What are parental perceptions toward the DY program?
6. What has been the experience of program staff during the program year?

To answer these questions, evaluators administered five rounds of surveys and questionnaires over the 2003–2004 program year to 35 DY youth, measuring changes in youth's learning and sentiments. Ten youth participated in focus groups about their experiences in the program, changes in self-esteem, and interactions with staff, peers, and communities. A group evaluation exercise was conducted in which groups of four to five youth responded to open-ended questions about the program's strengths and weaknesses and what they learned in the program. Parents were interviewed and surveyed about their impressions of DY and of whether their children's self-confidence and knowledge of the program materials increased. Finally, staff were surveyed to provide a comprehensive review of the program.

For the full profile of this evaluation, see the Harvard Family Research Project Out-of-School Time Program Evaluation Database at www.gse.harvard.edu/hfrp/projects/afterschool/evaldatabase.html.

Evaluation Methodologies

Across the set of technology-focused program evaluations, three types of research designs were used. These evaluation designs, along with the data collection methods used in each, are described below.

Most of the evaluations consisted of implementation studies. It is not surprising, then, that most utilized nonexperimental research designs, which typically use purposive sampling to get "information-rich" cases—for example, through case studies, ethnographic studies, participatory approaches, or data collection and reporting for accountability.[6] Data collection methods for the implementation studies included (a) observations of program sites and activities; (b) interviews, focus groups, and surveys with youth, staff, and other stakeholders; and (c) reviews of program documents and data. Many of the nonexperimental studies also assessed program impacts through the same data collection methods, by analyzing evaluators' observations of program activities and by asking youth and other stakeholders (e.g., staff) about their perceptions of how the programming impacted youth's lives.

A smaller set of evaluations included a quasi-experimental design component, primarily through the use of pretests and posttests with youth who participated in the program. These evaluations typically collected responses to survey questions or tests and assessments before the program began and at one or more points after the program ended. For example, the Minority Pre-Engineering Mentor Program evaluation administered an instrument assessing youth participants' career maturity at both the beginning and end of the summer program to determine whether participants developed such skills as more decisiveness about career decisions following their program participation.

Only one initiative, Fifth Dimension, utilized a quasi-experimental design that compared program participants to a group of nonparticipants. Four separate studies of Fifth Dimension programs evaluated program impact with this evaluation design. All four collected assessments of various skills from both participants and nonparticipants to estimate program impacts.

No studies in this review utilized an experimental design —that is, a study in which youth are randomly assigned to participate or not participate.

SPOTLIGHT on Fifth Dimension: One Technology Program's Evaluation of Youth Outcomes

The quasi-experimental studies of **Fifth Dimension/ University–Community Links** attempted to infer a causal connection between program participation and youth outcomes through the use of nonrandomly assigned comparison groups. The fact that these groups were not randomly assigned may have either masked or exaggerated program effects. In addition, all of the studies relied on very small samples, which also may have masked actual program effects. It should also be noted that these studies each drew on one program site and one technology approach, thus limiting the generalizability of the findings. With these caveats in mind, findings were as follows:

- **Boone, North Carolina, Fifth Dimension** – Program youth scored higher than a comparison group on both reading and math achievement tests. (The comparison group was "matched," or similar to program participants, on the basis of classroom and gender.)
- **Club Proteo Fifth Dimension Study #1** – Program youth performed better on a cognitive assessment called Puzzle Tanks and used more sophisticated problem solving strategies than a comparison group. (The comparison group was matched on the basis of English language proficiency classification, grade level, and gender.)
- **Club Proteo Fifth Dimension Study #2** – Program youth performed better on a Word Problem Comprehension Test than a matched comparison group, even when the two groups had similar pretest scores.
- **Boys & Girls Club of Escondido, California, Fifth Dimension** – Fifth Dimension "experts" outperformed Fifth Dimension "novices" on recall of both technology and Fifth Dimension-related words. There were no group differences, however, on general memory processing or speed of recall for nontechnology and non-Fifth-Dimension words.

For the full profile of this evaluation, see the Harvard Family Research Project Out-of-School Time Program Evaluation Database at www.gse.harvard.edu/hfrp/projects/afterschool/evaldatabase.html.

IMPACT OF TECHNOLOGY ON LEARNING & DEVELOPMENT

Many program evaluations based their conclusions about youth outcomes on nonexperimental site visits and interviews with youth and staff. These studies generally reported that stakeholders found the program valuable and that the program helped youth learn new skills and enhanced their development, including knowledge of and comfort with technology, improved social skills, and development of technological skills.

Similarly, the quasi-experimental pretest/posttest studies documented improvements in a number of areas, primarily comfort and facility with technology, confidence, and technology-related interests and skills. Lastly, the quasi-experimental comparison-group studies of Fifth Dimension programs reported a number of positive youth outcomes, including better problem solving strategies, increased word comprehension, and higher achievement test scores.

IMPLEMENTATION CHALLENGES & SUCCESSES

While the evidence that incorporating technology into OST programs can yield positive participant gains is somewhat limited, evaluations to date do shed light on some program implementation challenges that affect the capacity of programs to impact those gains. The evaluations in this review reveal a set of common challenges to and successes in implementing technology-focused OST programming.

1. *Technology has the power to engage youth.* By most accounts, youth seem especially drawn to working with technology, and program stakeholders frequently reported that the implementation of technology-focused programming helped to attract and engage youth.

For example, the South Bay Project's youth participants were drawn to the fun and playful learning environment created by technology-focused activities, and observations and interviews revealed that youth who were doing poorly in school excelled in their multimedia projects at the program. Engaging youth was not always easy, however. Common challenges included (a) engaging older youth in the programming, (b) keeping software-based programming "fresh" since youth may become bored using the same software repeatedly, and (c) finding technology programming that is of interest to diverse groups of youth.

2. *Staffing for technology-focused programs is challenging.* Evaluations frequently revealed staffing-related concerns, especially in recruiting and retaining technology-savvy staff in

SPOTLIGHT on Jobs for Youth—Boston PLATO Summer Transition Program: Learning From One Technology Program's Implementation Study

Jobs for Youth—Boston PLATO Summer Transition Program provides ninth graders at Madison Park Alternative High School in Boston, Massachusetts, who failed the citywide public schools' math or reading test, with supplemental instruction using specially designed computer instruction software called PLATO. In 2000 and 2001, evaluators collected surveys and interviews from teachers working in the program, other program staff, and youth participants to understand what lessons could be learned about the program's implementation. Findings from this component of the evaluation included:

- Teachers and youth both expressed high levels of satisfaction with the PLATO software. Some challenges arose, however, because of the lengthiness of PLATO assessments and the redundancy of some items in the software's drills and mastery tests.
- Hardware capabilities were critical to PLATO's successful implementation. There were some problems with screens freezing or looping. PLATO's Help Desk dealt with such technical difficulties.
- Staff needed significant amounts of training to successfully deal with hardware and software issues and to utilize the technology most effectively for youth's instruction.
- Multiple staff members were necessary to simultaneously handle technical difficulties, give youth appropriate help, and monitor behavior in the computer lab.

the context of limited program budgets and existing staffing problems.

For instance, at the Martin Luther King, Jr. After-School Program, staff attrition was a challenge, given the program's demands for technological expertise. The evaluation of NYC FIRST!, a program engaging youth in building robots, also noted that the program faced challenges in maintaining staff with technology expertise but was successful in retaining staff who were interested in and dedicated to engaging youth with technology. A number of programs also utilized volunteers such as college students and professionals in technology-related careers to bring the requisite technological expertise and dedication to the programs' missions.

3. *Technology-focused programs require a commitment to infrastructure maintenance.* A number of evaluations reported that once programs implemented technology-focused programming, they were challenged to develop the ability to deal with technology-related problems. Common problems included maintaining Internet connectivity and hardware performance and updating and repairing technological equipment.

The InfoLink program found that it had to constantly maintain access to well-equipped computer labs and the most advanced software in order to provide a quality program. To meet these challenges, some programs, such as the District of Columbia 21st Century Community Learning Centers, developed a system of technical assistance to monitor and assist with such difficulties.

4. *Programs need to determine the balance among technology, enrichment, and academics.* Another challenge was getting the right "mix" of programming for youth and balancing technology-related educational goals with fun and enrichment.

Discovery Youth, in which older youth use multimedia technology to construct health-related educational materials for younger children, found that it was a challenge to balance youth's desire to focus on the program's video technology with the program's goals of developing knowledge about health topics and research. The evaluation of the District of Columbia 21st Century Community Learning Centers, which used computers and software to build reading and math skills, revealed that youth found the more remedial reading programs boring and repetitious and that as a result, some youth were not engaged in the programming. In the Intel Computer Clubhouse Network, one of the community technology center programs, the initiative's goals of providing enriching, fun, and hands-on learning activities sometimes conflicted with staff and local stakeholders' goals of using technology to help schools meet academic standards.

MOVING TECHNOLOGY-FOCUSED PROGRAMMING FORWARD

Technology can enhance OST programs in a variety of ways—as a tool for attracting and retaining youth, as a mechanism to build program infrastructure, and as a means to promote learning and development in the nonschool hours. Existing technology-focused programs are diverse in their settings, approaches, and goals. However, evaluations of these programs and initiatives identify a common set of emerging themes. Implementation and maintenance of such programs clearly provide some challenges unique to technology-focused programming, including special staffing, maintenance, and programming issues.

In addition, many evaluations have documented stakeholder satisfaction with the programs and presented evidence that youth may be benefiting from their participation in areas such as career development, youth development, and academic attitudes and skills. As with other aspects of OST programming, to fully understand the impact of the growing use of technology on OST programs and their participants, programs will need to continue to collect implementation information but ramp up their efforts to better understand outcomes. Future evaluations should also take into account the diversity of technology-focused programming in order to provide useable information about meeting implementation challenges and identifying the program characteristics that contribute to the effectiveness of these programs for youth.

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NOTES

1. U.S. Department of Commerce, Economics and Statistics Administration, National Telecommunications and Information Administration. (2002). *A nation online: How Americans are expanding their use of the Internet.* Washington, DC: Author. www.ntia.doc.gov/ntiahome/dn/html/anationonline2.htm
2. Hall, G., & Israel, L. (2004). *Using technology to support academic achievement for at-risk teens during out-of-school time: Literature review.* Newton, MA: America Connects Consortium, Education Development Center.
3. Learn more about complementary learning at www.complementarylearning.org.
4. Formative evaluations are conducted during program implementation in order to provide information that will strengthen or improve the program, for example, about how services are provided or about how many youth participate.
5. Summative evaluations are conducted either during or at the end of a program's implementation and assess whether a program is effective or has achieved its intended outcomes.
6. Little, P. M. D., Dupree, S., & Deich, S. (2002). *Documenting progress and demonstrating results: Evaluating local out-of-school time programs.* Cambridge, MA: Harvard Family Research Project. www.gse.harvard.edu/hfrp/projects/afterschool/resources/index.html#local

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Founded in 1983, HFRP's mission is to promote more effective educational practices, programs, and policies for disadvantaged children and youth by generating, publishing, and disseminating our and others' research. We believe that for all children to be successful from birth through adolescence there must be an array of learning supports around them. These supports, which must reach beyond the school, should be linked and work toward consistent learning and developmental outcomes for children. HFRP calls this network of supports *complementary learning.*

Additional Resources on Using Technology in OST

Education Development Center's (EDC) Center for Children and Technology investigates the role that technology can play in improving teaching and learning inside and outside the classroom. The Center designs and develops technology applications that support engaged, active learning in formal and informal settings. The Center also evaluates educational initiatives, projects, and programs; conducts basic, applied, formative, and partnership research in collaboration with educational, corporate, government, and research institutions; consults organizations planning to launch new educational ventures; and develops new programs or boost existing ones. www2.edc.org/CCT

Afterschool & Technology Section of EDC's YouthLearn Website links to current projects, model programs, and resources within the YouthLearn site meant to aid the after school practitioner in developing both technology-supported and content-rich curriculum. www.youthlearn.org/afterschool

EDC's YouthLearn designed ***The YouthLearn Guide: A Creative Approach to Working With Youth and Technology*** to be an easy-to-use, hands-on manual with more than 160 pages of lessons, worksheets, and sample activities on how to set up a new learning program or enhance an existing one. The guide seeks to help practitioners combine new technologies and proven teaching techniques in ways that will make their work more rewarding for practitioners and the children they serve. www.youthlearn.org/guide

The paper ***Children Learning With Technology Beyond the School Bell and Building: What Do We Know Now?*** considers what we know now about children learning with technology in school—beyond the bell—by participating in before school and after school programs and summer school, and beyond the school building in community technology centers and public libraries. In these four settings, the following questions are addressed about children learning with technology: (a) What technology can children use to learn? (b) How do children use technology to learn? and (c) What difference does using technology make for the children? www.ncrel.org/tech/child

The fall 2004 issue of ***The Evaluation Exchange*** on **Harnessing Technology for Evaluation** explores the contribution of technology to evaluation practice, with articles centering on four key areas in which evaluators are using technology: data collection and analysis, collaboration, knowledge mobilization, and evaluation capacity building. Rounding out the issue is a special feature on the role technology plays in fostering youth civic engagement and in evaluating programs for youth. www.gse.harvard.edu/hfrp/eval/issue27

APPENDIX: PROGRAMS AND EVALUATIONS INCLUDED IN THE REVIEW

Program	References
21st Century Community Learning Centers—District of Columbia This program, begun in 1999 and completed in 2002, included after school, summer, and weekend programs for youth in Washington, D.C.	Liu, M., Russell, V., Chaplin, D., Raphael, J., Fu, H., & Anthony, E. (2002). *Using technology to improve academic achievement in out-of-school-time programs in Washington, D.C.* Washington, DC: Urban Institute. www.urban.org/url.cfm?ID=410578
Boys and Girls Clubs of America's Project Connect Initiated in 1999 in a small number of Boys & Girls Clubs across the country, this pilot program was designed to test the feasibility of installing computer centers in Clubs nationwide. These Clubs provided enhanced access to technology, educational software, and the Internet.	Henriquez, A., & Ba, H. (2000). *Project Connect: Bridging the digital divide—Final evaluation report*. New York: Center for Children & Technology, Educational Development Center. www2.edc.org/CCT/admin/publications/report/pc_bdd00.pdf
Discovery Youth Initiated in 2001, this after school program gives 10- to 14-year-olds in San Jose, California, the chance to develop multimedia projects that promote healthy behaviors to other audiences, especially younger peers.	Gilbert, D. (2002). *Looking back and looking ahead: A formative evaluation of Discovery Youth at San Jose Children's Discovery Museum*. San Jose, CA: San Jose Children's Discovery Museum. Moghadam, S. H. (2004). *An evaluation of the San Jose Children's Discovery Museum after school and weekend program*. Oakland, CA: ASSESS. www.cdm.org/p/viewPage.asp?mlid=159
Fifth Dimension/University–Community Links Begun in 1986, this after school programming approach is used by Boys and Girls Clubs, YMCAs and YWCAs, recreation centers, and public schools in several countries, including the U.S., with a special focus in California. It provides a way to increase the educational programming of such institutions without substantially increasing the costs of operation.	Blanton, W. E., Moorman, G. B., Hayes, B. A., & Warner, M. L. (1997). Effects of participation in the Fifth Dimension on far transfer. *Journal of Educational Computing Research, 16*, 371–396. 129.171.53.1/blantonw/5dClhse/publications/tech/effects/effects.html Schustack, M. W., Strauss, R., & Worden, P. E. (1997). Learning about technology in a non-instructional environment. *Journal of Educational Computing Research, 16*, 337–352. Mayer, R. E., Quilici, J., Moreno, R., Durán, R., Woodbridge, S., Simon, R., et al. (1997). Cognitive consequences of participation in a Fifth Dimension after-school computer club. *Journal of Educational Computing Research, 16*, 353–369. 129.171.53.1/blantonw/5dClhse/publications/tech/Mayer-Duran.html Mayer, R. E., Quilici, J. H., & Moreno, R. (1999). What is learned in an after-school computer club? *Journal of Educational Computing Research, 20*, 223–235. Sturak, T. L. (2000). *Evaluation of Expedition: Computers and archaeology after school.* Berkeley: University of California at Berkeley, Interactive University Project. www.mactia.berkeley.edu/aop/activity/expedition.pdf Sturak, T. L. (2001). *Expedition— Computers and archaeology after school: Year-end report, 2000–2001*. Berkeley: University of California at Berkeley, Interactive University Project.
Girls Math and Technology Program Initiated in 1998, this residential summer camp in northern Nevada is designed to impact middle school girls' attitudes and perceived abilities in mathematics and technology.	Wiest, L. (2003). *The impact of a summer mathematics and technology program for middle school girls*. Reno, NV: Author.
InfoLink In operation from 1994 to 2002 in Pittsburgh, Pennsylvania, this intensive summer program provided low-income high school students with information technology and professional development skills, experience, and confidence to improve their long-term educational and occupational attainment.	Nelson, C. A., Post, J., & Bickel, B. (2002). *InfoLink final evaluation report: Building confidence and aspirations in low income high school students through a technology and workforce skills development program: Lessons learned from the InfoLink experience, 1994–2002*. Pittsburgh, PA: InfoLink of Southwestern Pittsburgh. itclass.heinz.cmu.edu/infolink2003/InfoLink03/docs/Lessons_Learned.pdf
Intel Computer Clubhouse Network Begun in 2000, this national program encourages young people to use technology-rich environments to construct artifacts, explore ideas, and creatively express themselves in collaboration with peers and local mentors.	Pryor, T., Culp, K. M., Lutz, S., & John, K. (2001). *Evaluation of the Intel Computer Clubhouse Network, year 1*. New York: Center for Children and Technology, Education Development Center. www2.edc.org/cct/publications_report_summary.asp?numPubId=46 Pryor, T., Culp, K. M., Lavine, M., & Hochman, J. (2002). *Evaluation of the Intel Computer Clubhouse, year 2 report*. New York: Center for Children and Technology, Education Development Center. www2.edc.org/cct/publications_report_summary.asp?numPubId=79
Jobs for Youth—Boston PLATO Summer Transition Program This program, initiated in 2000, provides ninth grade students in Boston, Massachusetts, who failed the citywide public schools' math or reading test, with supplemental instruction using specially designed computer instruction software called PLATO.	Quinn, D. W., & Quinn, N. W. (2001). *PLATO learning evaluation series: Jobs for Youth, Madison Park Alternative High School, Boston, Massachusetts*. Bloomington, MN: PLATO Learning. www.plato.com/downloads/evaluations/madison.pdf
Kids Learning in Computer Klubhouses (KLICK!) Begun in 1999, this consortium of 10 middle school after school computer clubhouses across Michigan provides safe and engaging learning opportunities to students during the out-of-school hours.	Zhao, Y., Mishra, P., & Girod, M. (2000). A clubhouse is a clubhouse is a clubhouse. *Computers in Human Behavior. 16*(3), 287–300. citeseer.ist.psu.edu/cache/papers/cs/13618/http:zSzzSzpunya.educ.msu.eduzSzpubszSzprintzSzclubhouse.pdf/a-clubhouse-is-a.pdf Garner, R., & Zhao, Y. (2000). Afterschool centers in four rural communities in Michigan. *Computers in Human Behavior. 16*(3), 301–311.

Martin Luther King, Jr. After-School Program This after school technology project in Dorchester, Massachusetts, for middle and high school students uses the Encarta Africana 2000 (a CD-ROM encyclopedia of Africa and its diaspora) as the core of the curriculum. The goal of the program is to teach technology skills through the study of Afrocentric topics.

Goldsmith, L., & Sherman, A. (2002). *Evaluation of the pilot year of the Martin Luther King, Jr. After-School Program*. Newton, MA: Education Development Center.

Matzko, M. (2002). *An evaluation study of the Martin Luther King, Jr. After-School Program*. Somerville, MA: Brett Consulting Group.

Minority Pre-Engineering Mentor Program This summer program in Wichita, Kansas, involves high school juniors in science, math, and engineering workshops and offers tutorials in note taking, calculator use, and computer usage and programming, as well as a job shadowing internship at the Boeing Military Airplane Company. The program is designed to increase minority participation in math, science, and engineering.

Dunn, C. W., & Veltman, G. C. (1989). Addressing the restrictive career maturity patterns of minority youth: A program evaluation. *Journal of Multicultural Counseling and Development, 17*, 156–165.

Missouri 4-H and Missouri Department of Elementary and Secondary Education After School Computer Lab Project Begun in 1998, this project assists Missouri schools and other community organizations in developing computer-based after school programs for elementary through junior high school youth. The primary purpose is to create a supervised and supportive environment that encourages youth to play computer games that have positive educational content.

Benesh, C., & Pabst, B. (2003). *Playing to learn: An evaluation of the participation of upper elementary and middle school students in Missouri recreational computer lab programs*. Columbia, MO: University of Missouri Columbia Outreach & Extension. 4h.missouri.edu/go/projects/computer/labs

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NYC FIRST! Implemented in 1998, this program in New York City is typically run as either an after school or weekend program. FIRST is a national organization that engages middle and high school students, working with adult coaches and mentors, in researching, designing, and building robots and participating in games of skill and strategy meant to transfer the enthusiasm youth feel for athletics to the fields of math, science, and engineering.

Jeffers, L. (2003). *Evaluation of NYC FIRST!* New York: Center for Children and Technology, Educational Development Center. www2.edc.org/CCT/publications_report_summary.asp?numPubId=141

PowerUP Founded in 1999, this program's mission is to ensure that America's underserved youth acquire the skills, experiences, and resources to succeed in the digital age. PowerUP provides technology, funding, training, and technical assistance to local PowerUP centers, which foster positive development among youth during after school, evening, and weekend hours.

Vesneski, W., Skinner, N., & Schneider, L. (2002). *PowerUP evaluation report*. Seattle, WA: The Evaluate Group.

SECME RISE (Raising Interest in Science & Engineering) Begun in 1998, this 3-year program aimed to increase middle school girls' self-esteem and confidence in learning mathematics and science, therefore reducing the attrition in advanced level mathematics and science coursework that occurs as girls move from middle school to high school.

Jarvis, C. (1999). *SECME RISE Raising Interest in Science & Engineering: Year one progress report*. Miami, FL: Miami Museum of Science. www.miamisci.org/rise/report1.html

Jarvis, C. (1999). *SECME RISE Raising Interest in Science & Engineering: Year two progress report*. Miami, FL: Miami Museum of Science. www.miamisci.org/rise/report2.html

Jarvis, C. (2002). *SECME RISE Raising Interest in Science & Engineering: Final evaluation report, September 1, 1998–August 31, 2001*. Miami, FL: Miami Museum of Science.

South Bay Project This collaboration of school and community institutions provides K–12 students in low-performing schools in San Diego, California, with computer-integrated activities after school. The program provides computer-mediated activities combining play with academically rigorous learning in a low-surveillance, collaborative learning environment.

Tripp, L. M. (2002). *Trying to bend the bars of the iron cage: A case study of a K–12 partnership*. Unpublished doctoral dissertation, University of California, San Diego.

STUDIO 3D Initiated in 2000, this after school outreach program provides access for 10- to 18-year-olds living in low-income, inner-city neighborhoods in Minneapolis and St. Paul, Minnesota, to equipment, software, and adult mentors to support them in learning and applying advanced digital design technologies.

Volkov, B. B., & King, J. A. (2003). *Report of STUDIO 3D project evaluation*. Minneapolis: University of Minnesota, Department of Educational Policy and Administration, Evaluation Studies Program. www.smm.org/studio3d/mission.html

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Technology-Rich Virtual Community After School Class This program, implemented in 2001, creates technology-rich activities and experiences for an after school class in science and technology for middle school girls from a low socioeconomic urban neighborhood. The program was designed to create a virtual community of practice whose members used science in diverse ways.

Edwards, L. D. (2002). *Creating a virtual community of practice to investigate legitimate peripheral participation by African American middle school girls in science activities*. Unpublished doctoral dissertation, University of Colorado, Boulder.

University of Virginia's Summer Enrichment Program Invention and Design Initiated in 1994, this is a 3-week summer invention and design course in Charlottesville, Virginia, for high school students.

Plucker, J. A., & Gorman, M. E. (1999). Invention is in the mind of the adolescent: Effects of a summer course one year later. *Creativity Research Journal, 12*(2), 141–150.