Using Technology to Support Learning in After-School Programs

Education Development Center (EDC)

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Using Technology to Support Learning in After-School Programs

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Executive Summary

Educational Technology: Issues and Context

The rapid growth of digital technology has filled educational settings with a vast array of hardware devices and software applications. Internet accessible computers for classroom and laboratory use are found in virtually every school today. But technology comes with its own set of issues – hardware and software acquisition, technical management and support, and training and professional development – must be considered when planning any program with educational goals.

Additionally, assumptions about how children learn and what they should be learning need to be matched to the appropriate technology. Computers are good tools for presenting factual content and testing individual learners, helping to prepare them for tests such as the MCAS. Computers can also support group activities and projects that are learner-centered and process-oriented. While state-mandated tests tend to focus on basic skills, they are also beginning to measure other kinds of learning outcomes. These outcomes are associated with new national standards for instruction in mathematics, language arts, science, and social studies that call for teachers to engage children in higher-order thinking, communicating for a variety of purposes, and solving complex problems. To meet the challenges of the 21st century, students not only need basic knowledge and skills, they need to develop "thinking skills necessary to put knowledge into practice."[1] Ideally, these skills are developed in socially interactive settings where students seek creative solutions to challenging, non-routine tasks.

Technology has the power to motivate and further children's learning provided that it is used thoughtfully, with sufficient support, and with clear learning goals in mind. If after-school programs are going to use technology to promote learning, it will be important for them to consider issues of program design and implementation in order to create effective learning environments that will appeal to the young people they wish to serve. In addition, for informal settings like after-school programs, the use of technology needs to fit with expectations and preferences that differ from formal school settings.

[1] *Final Report of the Secretary's Commission on Achieving Necessary Skills (SCANS), appointed by the U.S. Secretary of Labor.*

Although the number of studies that examine the use of technology to promote learning in non-school settings is relatively small, one reported on effective practices. The best practices detailed in this study[2] include:

- giving students additional time (outside of the school day) to practice literacy and math skills
- providing a learning environment unlike a traditional classroom in order to avoid raising children's negative feelings associated with poor performance in school (for example, by supporting exploratory activities in learning how to use a computer)
- allowing youth who have technical skills to serve as volunteers and mentors (gives them a new perspective on teaching and learning)
- building a partnership with a school to share resources and promote both as welcoming sites for lifelong learning
- providing access to technology for students who lack home computers (leaving the playing field by helping them create the same "look and feel" of written reports, use the internet and email, use online reference tools, etc.)
- creating a realistic workplace setting as part of a job training program for older students
- developing a sense of community and ownership through peer collaboration and support

A "Scan" of Technology Use in After-School Programs

We reviewed websites of many youth-serving organizations and schools in Boston, interviewed staff at representative programs and leadership agencies, and conducted a focus group at Bunker Hill Community College. Our "scan" provides an illustrative and analytical overview of how technology is used for learning in after-school programs in Boston. Our research was guided by three questions:

- What technology programs are available at these sites?
- How is technology used for learning in after-school programs?
- What are challenges that after-school programs face in improving their technology programs for children and youth?

[2]*The Organization of Learning in Community Technology Centers: Learning with Technology in Six Communities, paper presented at the annual meeting of the AERA, April 10-14, 2001, Seattle WA. Bill Penuel, Vera Michalchik, Debra Y. Kim, Linda Shear. Available URL http://www.sri.com/policy/ctl/assets/pdfs/vstaera2001.pdf [last accessed 8/20/02]*

In Boston, technology programs for children and youth in after-school programs are taking place in three types of settings: community technology centers; community-based organizations (CBOs); and programs that are based in Boston municipal facilities, including schools, community centers, and public housing. Our scan covered two large programs undertaken by the City: Boston Centers for Youth & Families and Boston Community Learning Centers (BCLC). In addition, we examined technology programs and future initiatives by the Boston Public Schools that relate to after-school programs.

We found a few exemplary after-school programs in Boston that used technology. One is the Intel Computer Clubhouse Network, which grew from the flagship clubhouse founded in 1993 at the Boston Computer Museum (now housed at the Museum of Science). A number of clubhouses have been established in partnership with local youth-serving organizations; e.g., the Boys and Girls Clubs of Boston, the Patriots' Trail Girl Scouts, and United South End Settlements. In general, we found that after-school program personnel are still in the early stage of determining how to use technology effectively to promote student learning. We also found that:

- While community technology centers are likely to be rich in technology, they are less likely to have developed educational programs for children that have an academic skills focus. While there are examples of programs in community technology programs that tie after-school activities to academic learning, such educational programming is the exception rather than the rule.
- Community-based organizations throughout Boston have progressed at a different pace in adding and integrating technology into their after-school programs. Many larger CBOs with the capacity to capitalize and support technology have computer labs. These labs serve multiple functions, including computer courses for adults, job-training programs, and ESL classes. Some after-school programs have been able to arrange computer access time for students. Programs such as the Intel Computer ClubHouses create an open environment of learner-driven activities. More structured learning programs aimed specifically at academic outcomes such as MCAS preparation are uncommon. This finding is not surprising given that CBO staff lack training on using technology and using it to reach specific learning outcomes.

- Those after-school programs based in Boston Public Schools have a unique opportunity to leverage the existing infrastructure. Even when after-school programs have access to the school's computer labs and use the labs for individual student projects and homework, they generally do not have the resources to train staff and to develop structured learning activities for elementary and middle school students. Instead, they rely heavily on the school's computer instructional staff and trained para-professionals to provide support and instruction in the labs. School-based after-school programs at the high school level generally engage students who are interested in technology careers to participate in self-directed technology projects.

After-school providers were asked about the challenges they faced with regard to using technology in their programs. Their responses included the acquisition and management of technology, staffing, facilities, and curriculum materials:

- ***Technology is not 'forgiving.' If one thing goes wrong, the whole thing doesn't work.***[3] Obtaining funding and/or material donations is a perpetual concern for community-based after-school programs. For those who choose to integrate technology, identifying and obtaining the appropriate forms of hardware and software are major issues.
- ***Training staff and converting staff who are not proponents of technology is a big concern.***[4] Lack of funds and time make this very difficult. Staff with technology skill are especially hard to retain because such skill is valuable in the commercial sector as well.
- ***Existing computer labs are designed for individual learning, making it hard to demonstrate things to a group of kids or support collaborative activities.***[5] The most common complaint voiced in after-school programs is the lack of connection and coordination between the school and after-school staff regarding the use of facilities and equipment.[6] Borrowed or temporary space prevents programs from tailoring an environment to make it a special place for children where they can feel comfortable, welcome, and have a sense of ownership and participation.

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[3] *comment from focus group participant at Bunker Hill Community College conference, June 2002*
[4] *comment from focus group participant at Bunker Hill Community College conference, June 2002*
[5] *comment from focus group participant at Bunker Hill Community College conference, June 2002*
[6] *U.S. Dept of Education Safe and Smart: Making After-School Hours Work for Kids – June 1998, Chapter 2, entitled What Works: Components of Exemplary After-School Programs. Available URL [last accessed 5/10/02]*
[7] *comment from focus group participant at Bunker Hill Community College conference, June 2002*

- ***Staff priorities are to carry out essential operating tasks. Consequently, doing the neat stuff' with kids gets neglected. Time to develop 'new stuff' isn't there.***[7] Providing technology access requires an additional commitment to selecting curriculum and designing activities that will meet students' needs.

Looking Forward

Boston after-school program providers clearly recognize the potential of technology in contributing to teaching and learning. But they also recognize that technology brings its own set of challenges, much of which seems to be beyond their limited resources in personnel and funding. These include hardware and software acquisition, technical management and support, training and professional development, and, for those in Boston Public School buildings, collaboration and coordination with the school staff. Community technology centers need not only continuing support in updating and expanding technology access, but particularly in developing after-school learning and instructional programs. Community-based organizations with a history of youth programs require not only assistance in integrating technology into their instruction but especially in acquiring technology and technological skill and competence. Both types of agencies need support in using technology to achieve specific learning goals and student outcomes.

These pragmatic issues are a daily reality for after-school programs. However, they can be addressed and ameliorated given the vast amount of resources available. These include best practice models, curriculum resources, networking and sharing opportunities, and technical assistance.

In 2001, the Boston Public Schools adopted LINC Boston II as a new five-year (2001-2006) technology plan to support the unifying goal of Boston Public Schools' education reform plan. LINC Boston II outlines a plan to "use technology to continue student and adult learning at school, at home, and in the community, at any time of day."[8] One of the policy directives in this plan that has specific relevance for after-school programs is found in Essential Six: Technology Supports Family and Community Engagement:[9]

- Schools will work closely with the Mayor's 2:00-to-6:00 After-School Initiative, the City's Office of Community Partnerships and other resources to engage students in educational and social activities beyond the school day.

[8] *Boston Public Schools, LINC Boston II: Comprehensive Technology Plan to Support Focus on Children II, p. IX. http://boston.k12.ma.us/linc2/lincdraft9_20.doc*
[9] *Ibid., p. 65.*

In addition, LINC Boston also set the following directives:[10]

- Principals and headmasters will be held accountable for setting goals and developing strategies to engage families and partners in the schools.
- Strong partnerships between schools and a variety of businesses, universities, human service providers and cultural institutions will support the schools' performance goals.

It is clear that the Boston Public Schools system supports extending the availability of its technology infrastructure to the community and on the policy and planning level, this is the case. The challenge is in extending the Partnership collaboration to every school.

Recommendations

Short term

Recommendation 1: Work in collaboration with Boston Public Schools.
It is clear from the LINC II plan that BPS is heading in the same direction as the Partnership in terms of expanding the availability and use of technology for learning beyond the school hours. To develop an appropriate response to these positive directives and steps, the Partnership needs to:

- Conduct outreach to principals, headmasters, and School Site Councils on the merit and importance of learning through technology in after-school programs. Work with them to open doors to their technology labs, classroom computers, and other technology resources. Work with schools to develop guidelines to ensure security, maintenance, and effective use of the facility.
- Develop a formal agreement with TechBoston for reliable IT support for after-school programs, including helpdesk support, maintenance, and technology training.
- Work with the Technology Goes Home program to involve after-school program students and their families in this program.

Recommendation 2: Coordinate, facilitate, and provide technical assistance and material resources to after-school programs. As indicated in the section on resources, there are ample resources and technical assistance for after-school programs to access. However, many after-school programs do not know

[10] *Ibid.*

about them or believe that it takes more time and effort to find and use help than it is worth. There is no need to reinvent the wheel in terms of technological support and material resources. What is needed for cost-effective impact is to bridge existing resources to after-school program providers. In addition, the Partnership should make available direct technical resources to fill in the gaps that the national technical assistance providers cannot focus on. Local technical assistance should be made available when strategic tailoring of assistance is required. After-school programs need the following types of assistance:

- Professional development, including developing a system of credentialing in learning technology so that staff will be rewarded with better pay
- Hardware and software acquisition
- Fund raising strategies and grant resources
- Curriculum resources, particularly how to access curriculum materials from the Internet and to evaluate appropriate instructional materials for their programs
- Learning goals and learner outcomes, including how to develop appropriate technology integration strategies to reach the identified learning goals; particular attention may be paid to the Boston Public Schools standards and frameworks
- Evaluation methodologies and tools

Recommendation 3: Build a network of after-school programs in Boston.

To support the work in previous recommendations, after-school programs need to organize themselves into a collaborative network with a leadership team and staff support. The function of this network will be to:

- Facilitate sharing of information, planning, and activities.
- Provide staffing support.
- Negotiate lower, volume-based rates for fee-based services and training.
- Work with BPS and the City to ensure that all after-school programs have access to the MyBPS portal, in order to access and share critical data and best practices.
- Use existing BPS and City intranets (LIZA, MetroLINC, MyBPS) as a model to establish an electronic learning community that focuses on issues related to technology integration in after-school programs.

Recommendation 4. Establish grants with a priority toward supporting technology for learning. The Partnership should make using technology for learning a major priority in its support of after-school programs. A key criterion for funding is that the applicant must clearly define the learning goals to be achieved and connect the use of technology to the identified learning outcomes. The Partnership may also wish to:

- Fund pilot programs with strong educational vision and capacity to implement learning activities using technology. These programs can serve as leadership sites for the Boston-wide electronic learning community.
- Incubate new programs targeting underserved populations (e.g., homeless children, recent immigrants, incarcerated youth, and disabled children). These programs can serve as critical test cases and potential best practices for using technology integration to assist difficult-to-serve populations.
- Create a scholarship fund to support after-school staff participation training.

Long Term

In the long term, the Partnership may wish to develop a Boston-wide vision for technology integration in after-school programs. This vision should clearly delineate that technology is an important factor and tool in achieving the learning goals of after-school programs of today and tomorrow. The vision should create a central mission for all programs in terms of technology integration, and at the same time allow individual programs the flexibility to pursue various learning goals using technology. After-school programs should have a role in creating and promulgating this vision. They should feel ownership of this system-wide vision.

Moreover, the Partnership may wish to develop a vision of national leadership and make Boston a national model of citywide collaboration and collective advancement. To achieve this goal, action research monitoring and studying the Partnership's technology initiative in support of after-school programs will need to be done.

Educational Technology: Issues and Context

What is Educational Technology?

The rapid growth of digital technology in recent decades has filled the educational marketplace with a vast array of hardware devices and software applications. Computers and printers for classroom and laboratory use are found in virtually every school today. Multimedia computers with audio and video capabilities and scanners that transform images printed on paper into a format that can be stored and manipulated on a computer are increasingly available to teachers and students. Local area networks that permit small groups of people to share files and communicate electronically have become a standard for school administrators and staff, and are rapidly becoming a standard for teachers and students. More recently, re-wiring schools so they can acquire Internet access and e-mail accounts has been a focus of federal legislation through programs like the e-Rate. While desktop computers in classrooms and computer labs still form the backbone of educational technology, other devices such as laptops, digital cameras and camcorders, graphing calculators, personal digital assistants (PDA's), and cell phones with photographic and Internet capabilities are introducing new possibilities for educational experiences.

This ever expanding variety of hardware devices, when combined with the range of software that is available for it, produces a seemingly infinite number of ways that technology can be used for teaching and learning. But technology brings along its own set of issues that must be considered when planning any program with educational goals. Hardware and software acquisition, technical management and support, and training and professional development pose new problems, whether in one-computer settings or in labs with a dozen or more networked machines.

Also, assumptions about how children learn and what they should be learning need to be matched to appropriate implementations of technology. Computers can do a good job of presenting factual content and testing individual learners, helping to prepare them for high-stakes tests such as the MCAS. Computers can also support group activities and projects that are learner-centered and process-oriented. While state-mandated tests tend to focus on basic skills, they are also beginning to measure other kinds of learning

outcomes. These outcomes are associated with new national standards for instruction in mathematics, language arts, science, and social studies that call for teachers to engage children in higher-order thinking, communicating for a variety of purposes, and solving complex problems. To meet the challenges of the 21st century, students need not only basic knowledge and skills, they need to develop "thinking skills necessary to put knowledge into practice."[11] Ideally, these skills are developed in socially interactive settings where students seek creative solutions to challenging, non-routine tasks.

Technology has the power to motivate and further children's learning in a multitude of ways, provided it is used thoughtfully, with sufficient support, and with clear learning goals in mind. If after-school programs are going to use technology to promote learning, it will be important for them to consider issues of program design and implementation in order to create effective learning environments that will appeal to the young people they wish to serve. In addition, for informal settings like after-school programs, the use of technology needs to fit with expectations and preferences that differ from formal school settings.

The most prevalent form of technology used in education – computers – is perhaps the most flexible of all the digital tools. Software, rather than the machine itself, determines how the machine will function. In simple terms, three broad categories of computer use characterize most of the applications that are used with students from pre-K through high school. These include:

- Drill and practice or tutorial programs that present information, test student knowledge, and provide practice in basic skills;
- Productivity tools such as word processors, spreadsheets, presentation software, databases, web page editors, and graphics packages; and
- Projects, which may involve productivity tools, programming languages, custom designed software, use of the Internet, and/or e-mail.

[11] *Final Report of the Secretary's Commission on Achieving Necessary Skills (SCANS), appointed by the U.S. Secretary of Labor.*

Drill And Practice, Tutorials

For students who are motivated to learn in this way, these programs can lead to higher test scores, especially if the tests ask the same kinds of questions the students have practiced answering. Expensive multi-grade-level programs intended for school use in computer learning labs can offer thousands of activities and branching routines that take individual students through a process intended to teach them basic facts and skills while measuring and directing their progress. Acclaimed by its publishers for improving student test scores in academic subjects, this type of software is still not an educational magic wand. The knowledge that students acquire tends to be fragmentary and disconnected, and students may be unable to apply it in new situations. Also, the emphasis placed on short answers (that the computer can evaluate) limits students' opportunity to develop a rich understanding of concepts. At the low end of this spectrum, inexpensive programs (Math Blaster being one of the most well known) provide practice in basic skills in a game format. In schools, stand-alone programs like these are used by individual students or small groups for assigned practice or as a preferred choice during their free time. An advantage of this type of program is that it requires virtually no teacher intervention. For this reason, after-school settings may be an appropriate venue for such applications, especially if children are willing to stay on task.

However, after-school settings can also fill a critical need by using technology to promote other kinds of learning. "There is a growing sentiment that the assessment of the impact of technology on learning involves more than just a look at changes in test scores – unless those test scores reflect the 21st century skills students need to succeed today."[12] Among the skills becoming increasingly important to students' future success are those associated with technological literacy, including familiarity with productivity tools.

[12] *Final Report of the U.S. Department of Education Secretary's Conference on Educational Technology 2000: Measuring the Impacts and Shaping the Future. Available URL http://www.ed.gov/Technology/techconf/2000/report.html [last accessed 8/20/02]*

Productivity Tools

Familiarizing students with productivity tools such as word processors, spreadsheets, presentation software, databases, graphics applications, and web page editors has become an essential learning goal for schools. Considering the prevalence of computers and other digital devices in schools, colleges, and workplaces, the importance of acquiring basic computer literacy skills as early as possible is obvious. In Boston Public Schools, kindergarten students are introduced to basic computer operations and terminology, first graders to word processing, second graders to graphing software, and third graders to databases and spreadsheets. Boston high school students, as a condition of graduation, must pass a 63-hour technology literacy course. The teaching and learning with technology section of the Boston Public Schools website *(http://boston.k12.ma.us/teach/technology)* is an excellent source of information about how technology is being integrated and supported locally.

After-school venues can promote student learning by providing students with access to the same productivity tools they use in school. Students can use these tools to complete school assignments as well as gain more time to practice techniques they learned in class or explore other uses of these tools. Students could also benefit from after-school instruction in one or more of these tools, whether or not they are also being shown how to use them in school, especially if their after-school instruction is oriented more toward their individual learning needs than would be possible in a school setting.

Projects

In school, students typically learn to use productivity tools by carrying out activities that will take them through a learning process in predictable ways that can be evaluated and graded. Open-ended technology-based projects are less often implemented in schools, especially if access to computers and technical support is limited. Some examples of project-based learning programs involve students in creating web pages, building computer-controlled robots, or producing a multimedia documentary on the history of their community. Others, with an Internet component, may have students collect and upload weather data that they share and analyze with other classes, communicate with an explorer on a real-life adventure, or follow clues that lead them to educational websites where they collect hidden symbols and earn certificates of achievement (the Internet equivalent of a scavenger hunt).

Learner-driven projects supported by productivity tools and other technologies address many 21st century learning goals, such as communicating clearly, trouble-shooting and solving non-routine problems, self-assessing and reflecting upon one's own learning process, and working collaboratively with others. Emerging standards for the workplace and responsible adulthood call for active and creative problem-solvers, life-long learners who are able to cooperate with others to perform complex tasks, use evidence to make convincing arguments, and assess their own accomplishments. Teachers are being encouraged to create this kind of learning environment in the classroom, but entrenched institutional realities still work against them. Class schedules, standardized tests, and other pressures of the school routine, as well as curriculum and school cultures aligned to traditional practice, all go to support a more regimented style of instruction.

After-school programs, with no demands to achieve specific academic outcomes, are in a better position to offer students opportunities to carry out their own ideas and projects, either individually or in collaboration with others. After-school venues can offer students opportunities to explore the full power of productivity tools over an extended period of time, while carrying out individual or group projects. For example, children might be interested in publishing a newspaper, collecting favorite recipes in a database, displaying photos or artwork on a web page, or tracking and charting baseball statistics in a spreadsheet. Student projects, especially student-initiated and/or self-directed projects, involve what many educators regard as the most meaningful learning experiences students can have.

Developing Technological Fluency

Technological fluency – the ability not only to use technical tools but also to construct things of significance with those tools – has been cited as a prerequisite for getting jobs and participating meaningfully in society.[13] Developing that kind of fluency takes both time and opportunity. After-school programs can do a lot to help youth become truly fluent with technology, and they can do this across a range of ages, interests, and abilities.

[13] *Resnick, M., Rusk, N., & Cooke, S. "The Computer Clubhouse: Technological Fluency in the Inner City," in D. Schon, B. Sanyal, & W. Mitchell, eds., High Technology and Low-Income Communities. MIT Press, 1998.*

Age Considerations

Technology is both accessible and appealing to children as young as preschoolers. Popular early learning programs teach fundamental skills such as sorting, comparing, and recognizing patterns. Playful formats, colorful graphics, attention-getting sounds, and appropriate use of rewards are engaging to children. Many of these programs are affordably priced in the $20-30 range; others are freely available on the web.

Younger children may get the most benefit from independent practice or sharing a computer activity with a friend or two. The marketplace is full of engaging software and specially designed interactive devices that teach children in pre-K through the lower elementary grades, fundamental facts and concepts while involving them in creative and playful activities. Many products include lesson plans or activity guides, manipulatives, and headphones. For example, one recent award-winner, Think & Go Phonics,[14] uses a colorful handheld device to present 34 games that progress from teaching alphabet sounds to pronouncing three-letter words that children key in.

As they enter their middle school years, children can begin to use the technology to carry out their own self-directed projects. In addition to developing skills they are acquiring with standard applications like databases, word processors, and spreadsheets, projects can help middle schoolers build additional skills with other digital tools such as video cameras and editors, midi devices, scanners, and programming languages. Internet skills can be developed by children who are seeking homework help, reference materials, or answers to specific questions. Sites specifically designed for children of this age can be a wonderful resource for them, providing short-term or extended activities, fascinating topics, and opportunities to communicate electronically with other children. For example, the award-winning web site, *http://FactMonster.com*,[15] is considered equally useful for both school and after-school activities.

Older children are more likely to participate in after-school activities that help them take on adult roles. Service learning projects, activities that will prepare them for college and careers, sports and creative arts or performance activities appeal to this age group. Having access to good quality technology can provide students at this age with the means and motivation to find out

[14] *Technology & Learning Awards of Excellence winner, presented in December 2001.*
[15] *Technology & Learning Awards of Excellence winner, presented in December 2001.*

what they need to know and apply it to productive ends. Some of these technical tools may be available in regular after-school sites. Others may require special arrangements such as internships or mentor-mentee relationships so that students can have access to more specialized technologies. A third option is to arrange field trips for students to expose them to state-of-the-art applications of technology.

Gender Considerations

In the pursuit of scientific and technological careers, women still do not enjoy the same educational opportunities as men.[16] Longstanding disparities continue to exist between the sexes in standardized test scores in math and science and participation in advanced track math and science courses. The association of math, science, and technology with masculine environments has been regarded as a principal cause for girls' avoidance of these domains. Efforts to address these disparities in after-school and summer programs entail creating girl-friendly atmospheres, introducing girls to female role models and mentors, and using technology to explore topics of high interest to girls.

After-school programs in the greater Boston area that have been successful in raising girls' interest in computers and other technologies include:

GIRLS INCORPORATED OF LYNN
www.girlsinclynn.org

This organization runs a computer club where middle school girls can learn computer and Internet skills, meet women who work with computers and technology, learn web page design, and go on field trips. Two other programs, Eureka! and Operation SMART, focus on raising girls' interest in mathematics, science, and technology. Also, during the school year, girls in the after-school program have access to a computer lab with an Internet connection and tutorial software in academic subjects.

[16] *U.S. Commission on Civil Rights, Equal Educational Opportunity and Nondiscrimination for Girls in Advanced Mathematics, Science, and Technology Education, 2000*

THE COMPUTER CLUBHOUSE AT BOSTON'S MUSEUM OF SCIENCE
www.computerclubhouse.org

Mondays have been designated Girls' Day at the Computer Clubhouse, bringing girls aged 10-18 together to explore, create, and develop projects based on their own interests. Girls' Day provides girls with access to technology, female mentors, and a positive learning environment in an effort to build self-confidence and technological fluency.

WOMEN EXPRESS, INC.
http://www.teenvoices.com/tvhome.html

The mission of this organization is to further social and economic justice to teenage and young adult women by empowering them with tools for making a positive impact on their developing lives. Their Teen Voices program teaches girls aged 13-18 journalism and computer skills and enables them to communicate about the issues that affect them most deeply; educate one another on topics they consider to be important; create a world-wide community of support; and build self-awareness, job skills, and self-esteem.

Language Considerations

After-school programs, especially those in urban areas, may serve groups of children whose first language is not only not English, it is not necessarily shared by other children in the group.[17] Technological support for learners with diverse languages is plentiful. Some educational software products and some Internet sites allow users to switch between English and another language. Many publishers offer software for ESL, TOEFL, and foreign language students. For example, Transparent Language *(http://www.transparent.com)* offers affordable products for language learning, reference, and translation, along with free proficiency tests in several languages, games, and other learning aids. The Rosetta Stone website *(http://rosettastone.com)* is another valuable resource for a variety of language learning needs. One community Technology Center Director reported that the free demo software that can be downloaded from this site was so versatile it appealed to students at all levels.

However, lacking knowledge of English does not necessarily restrict children from using computers and other digital technologies. If the program or the tool to be used doesn't require a lot of reading for its operation, a minimum

[17] *comment from focus group participant at Bunker Hill Community College conference, June 2002*

amount of guidance may be all that is needed to enable a non-English speaker to accomplish her objective. Another way to address the issue of language was taken by an after-school program at Erie Settlement House in Chicago. Noticing that the English language user's manuals were not helpful to their Spanish-speaking clients, the program director invited the older, bilingual students to develop a translated version. The result was a professional and practical product created with their desktop publishing software.

Physical and Learning Disability Considerations

According to one after-school provider, lack of accessibility to technology for kids with disabilities is a roadblock.[18] Special devices or modifications can address a range of physical and learning difficulties, and enable virtually all children to use computers and learn from using them. For children with different learning styles, an award-winning program in the area of language arts and special education, called Balanced Literacy,[19] is one example of how computers can offer various approaches to literacy for beginning readers. Its capability for producing songs, print, enlarged text, and using switch access make its lessons and activities accessible to many different kinds of learners.

In Boston, the Access Technology Center at Emmanuel College has produced a list of strategies and tools, including computer software and other digital devices, to support the needs of diverse learners. This list can be downloaded at *http://boston.k12.ma.us/teach/technology/emmanuel/SupportsList.doc.*

Best Practices

There are two basic approaches to using technology for educational purposes. One is to use software to teach, test, reward, and manage individual students' learning. The other is to incorporate one or more applications of technology into activities that are directed and managed by students, perhaps (but not necessarily) as part of a larger group activity. The former usually focuses on basic skills; the latter, on 21st century skills. Both can be effective in after-school settings. However, their effectiveness depends less on the technology being used than on the conditions under which it is used.

Many elements that contribute to high quality learning environments apply to both school and after-school settings, regardless of the extent to which

[18] *comment from focus group participant at Bunker Hill Community College conference, June 2002*
[19] *Technology & Learning Awards of Excellence winner, presented in December 2001.*

technology is integrated into the program. A recent U.S. Dept. of Education publication[20] listed several instructional practices that effectively engage students. These include the following:

- Academic enrichment and hands-on learning
- Thematic instruction
- Appropriately challenging curriculum
- Individual and small-group instruction
- Focus on problem-solving and decision-making skills
- Heterogeneous grouping, combining ages and abilities
- Interaction with caring adults

Other effective ways to engage students that were cited in this report are activities that motivate children to excel, build their interpersonal skills, increase their exposure to cultural and sporting events, and build citizenship skills. These activities were contrasted with those that focus on remedial work and memorization of facts and theories.

Criteria for school-wide or district-wide classroom-based best practices that integrate technology with teaching and learning are detailed in a recent U.S. Dept. of Education report.[21] Of the 134 implementations that were reviewed, only two met the criteria for exemplary programs. These programs offer images of how technology can be integrated into multidisciplinary, open-ended approaches that have real-world connections. The two exemplary programs are:

THE CHALLENGE 2000 MULTIMEDIA PROJECT

Created for K-12 students in 1995, this program helped classroom teachers design and implement student-centered, technology-supported, project-based learning. In this program, "students analyze and propose solutions for real-world problems by planning and producing interdisciplinary, multimedia projects." In one example, pairs of 12th grade physics students produced video presentations for younger students about the forces that affect amusement park rides. Using accelerometers and graphing calculators, students collected data during actual rides at a park. They also videotaped the rides.

[20] *U.S. Dept. of Education, Extending Learning Time for Disadvantaged Students-Volume 1 Summary of Promising Practices 1995. Available URL http://www.ed.gov/pubs/Extending/vol1/pt2a.html [last accessed 5/10/02}*

[21] *USDOE Educational Technology Expert Panel, Exemplary and promising educational technology programs 2000, February 2002, publication number ORAD 2001-1015.*

They uploaded their data to a classroom computer, and analyzed and graphed patterns of acceleration associated with rides they had experienced. At the end of the semester, students presented their findings and videos to younger students at a well-received "film festival." One presentation, for instance, explained how a circular-shaped loop on a roller coaster made people six times heavier at the bottom than a tear-shaped loop.

GENERATION WWW.Y (GENY)

http://www.genyes.org/genwwwy/

In this approach, instead of training teachers to use technology, students in grades 4-12 are trained to partner with teachers to improve teaching and learning. GenY students, most of whom are in grades 6-8, take an 18- or 30-week course (depending on their grade level) in computing and telecommunications skills with the objective of preparing them to help "rebuild the curricular units in their school so that teachers, administrators, and all students can make better use of modern technology." Along with technical skills, GenY students acquire skills in communication, collaboration, project planning and management, standards-based curriculum development, and effective presentation of information to learners. Together with a partner teacher, they work on unique projects with real-world constraints to develop and revise lesson plans and curriculum units. One example of a student project was a "HyperStudio unit on prefixes, suffixes, and root words that was easy for the class to understand and included a quiz that was fun to take." This program, funded by a federal Technology Initiative Challenge Grant, has been adopted by hundreds of schools across the U.S., with diverse student populations and a range of technical resources. Since the courses can be taught outside of the regular school day, GenY is an attractive option for after-school settings.

One of the relatively small number of studies that examine the use of technology to promote learning in non-school settings reported on effective practices in six community technology centers. The best practices detailed in this study[22] include:

- giving students additional time (outside of the school day) to practice literacy and math skills
- providing a learning environment unlike a traditional classroom in order to avoid raising children's negative feelings associated with poor performance in school (for example, by supporting exploratory activities in learning how to use a computer)
- allowing youth who have technical skills to serve as volunteers and mentors (gives them a new perspective on teaching and learning)
- building a partnership with a school to share resources and promote both as welcoming sites for lifelong learning
- providing access to technology for students who lack home computers (leveling the playing field by helping them create the same "look and feel" of written reports, use the internet and email, use online reference tools, etc.)
- creating a realistic workplace setting as part of a job training program for older students
- developing a sense of community and ownership through peer collaboration and support

Three other highly successful programs developed by community technology centers that embody the principles just listed are:

PLUGGED IN
http://www.pluggedin.org

This community technology center was established in 1992 in a low-income area to "ensure that everyone in East Palo Alto California has the opportunity to fully benefit from all that the information revolution has to offer." An informative history of the center is presented in considerable detail in the Toolkit section of the website. While the early focus was on using computers to provide basic skills practice, a summer program in which children worked

[22] *Bill Penuel, Vera Michalchik, Debra Y. Kim, Linda Shear, The Organization of Learning in Community Technology Centers: Learning with Technology in Six Communities, paper presented at the annual meeting of the AERA, April 10-14, 2001, Seattle WA. Available at http://www.sri.com/policy/ctl/assets/pdfs/vstaera2001.pdf [last accessed 8/20/02]*

on computer animation projects led staff to develop more opportunities for project-based learning. According to Plugged-In founder Bart Decrem:

By early 1993, it became clear to all of us that, although the basic skills program offered an important service, our team projects offered tremendous potential to complement the classroom education of our students. After we did a fairly straightforward team project called Escapes From The Zoo, some of the students involved in that project created their own magazine, Kidz Stuff. For the first time since I had worked at the computer lab, kids started taking initiative, started telling their own stories and started creating their own production teams.

While computer literacy classes and basic skills games and tutorials worked well for younger children, project-oriented activities using C programming, digital video, and HTML were highly appealing to teens (a notoriously difficult group to attract to after-school programs). Projects such as one involving documentary interviews about Palo Alto social issues enabled many students to develop solid technical and production skills. At one point, the center had to establish a "teen-free environment" so that younger children could have their fair share of computer time. The center currently runs three programs. Teenagers, trained by Plugged In Enterprises, create web pages for community members and paying commercial clients, including Pacific Bell and Sun Microsystems. Plugged In Greenhouse, a creative arts and technology studio for children, houses an after-school program, classroom partnerships, and special projects based on educational themes. The Technology Access Center provides the community with access to a production studio, copy center, cyber-library, self-paced learning studio, and telecommunications.

STREET LEVEL YOUTH MEDIA

http://streetlevel.iit.edu/

According to its mission statement, "Street-Level Youth Media educates Chicago's inner-city youth in media arts and emerging technologies for use in self-expression, communication, and social change. Street-Level programs build self-esteem and critical thinking skills for urban youth who have been historically neglected by policy makers and mass media. Using video production, computer art and the Internet, young people address community issues, access advanced technology and gain inclusion in our information-based society." Examples of projects carried out by Street-Level youth can be found at *http://streetlevel.iit.edu/youthprojects/youthprojects.html*. These include a

photojournalism project entitled "Through Our Eyes" in collaboration with Columbia College Chicago students; Chiksite, a website created by an "all-girls collaboration on what it means to be a women in cyberspace;" Kidz Werk, a "zine" filled with original short stories and pictures; an on-line project focusing on issues of American identity in Chicago's immigrant populations; and an interactive website for oral history collection and community dialogue, based on earlier projects involving video installations for the Chicago Historical Society. Other projects explored by young people using various technological media have focused on urban environmentalism, American and British slang, and the political scene at the Democratic National Convention. A multimedia block party is an annual event produced by Street Level Youth to celebrate all their work.

COMPUTER CLUBHOUSE

http://www.computerclubhouse.org/sat.htm

The Computer Clubhouse, 1997 winner of the Peter F. Drucker Award for Nonprofit Innovation, is an exemplary program that originated in Boston. In partnership with the Museum of Science, the MIT Media Lab, and Intel, 100 Computer Clubhouses are being established in under-served communities worldwide. Four principles guided the development of the original Computer Clubhouse. These are:

- Support learning through design experiences.
- Help youth build on their own interests.
- Cultivate "emergent community."
- Create an environment of respect and trust.[23t]

Clubhouse activities focus on helping children "acquire the tools, problem solving skills and confidence for successful lives." For example, one of its programs, Beyond Black Boxes, engages inner-city girls (ages 9 to 14) in scientific and technological inquiry in a way that feels relevant and inviting to them, with the goal of strengthening their interests and their intellectual, social, and emotional development. Details about this program, provided on the Computer Clubhouse website, include:

Working with staff and volunteer mentors (professionals and students from

[23]*The Computer Clubhouse: Technological Fluency in the Inner City. Available URL http://web.media.mit.edu/~mres/papers/Clubhouse/Clubhouse.htm [last accessed 5/16/02]*

Harvard, MIT, and Wellesley), participants built scientific instruments using LEGO, Crickets (microcomputers developed at the MIT Media Lab), motors, sensors, and various other building and art materials. Using Crickets, participants gathered, analyzed, and interpreted data. They created sculptures, moving environments, and other works of science/art. The BBB initiative encouraged experimentation, invention, and fun by making it ok to ask questions, to be beginners, to work individually as well as in groups. It introduced girls to building, design, computer programming, and career opportunities in science and technology.

Resources for Technology Programs

While technology brings along a host of problems and issues to those who wish to use it, it also presents abundant solutions, or at least, sources of information and support that can lead to solutions. High quality resources in the areas of curriculum and general support for using technology for educational purposes are detailed below.

Curriculum Resources

One of the best resources for curriculum and related materials is *http://www.ed.gov/free/*, the Federal Resources for Educational Excellence website. Here, visitors can search within academic content areas for free educational materials developed with federal government support. A recent posting is one example of the hundreds of outstanding teaching and learning materials easily accessed on this site:

A Visual Sourcebook of Chinese Civilization features 10 image-based units on Chinese history, culture, and society. Each unit organizes photos, maps, and art around a theme: China's geography, archaeology, religion, calligraphy, military technology, painting, homes, gardens, clothing, and the graphic arts. Questions highlight key facets of Chinese culture: Why is calligraphy highly ranked as an art form in China? Over what kinds of terrain did Chinese civilization spread? How did siege warfare in China compare with siege warfare in medieval Europe? (supported by the National Endowment for the Humanities).

Thousands of free lesson plans, worksheets, worksheet generators, webquests, problems, puzzles, and tests in a range of subject areas, including multi-disciplinary lessons, for grades K–12 can be obtained at sites such as the following:

- The Lesson Plans Page, *http://www.lessonplanspage.com/*
- edHelper.com, *http://www.edhelper.com/*
- Lesson Plan Central, *http://lessonplancentral.com/*

Websites designed specifically for children offer a range of materials, activities, and links to still more resources. Frequently recommended sites include the following:

- Berit's Best Sites for Children, *http://www.beritsbest.com/*, has links to 1000 other high quality children's sites and a weekly list of the most popular 25 sites, determined by tracking which links are chosen most frequently by site visitors.
- The Spaghetti Book Club, *http://www.spaghettibookclub.org*, a venue for children to publish book reviews and related artwork on the Internet. Lesson plans on developing book reviews, established publishing criteria, and a review panel all challenge young readers to think critically about the books they are reviewing.
- DLTK's Educational Activities for Children, *http://www.dltk-kids.com/*, has interactive games and worksheets to help young children learn and practice basic math and literacy skills, as well as crafts and other kinds of learning activities. It also has links to sites that provide activities in French and Spanish for children at the pre-school and elementary grade levels.
- NASA Kids, *http://kids.msfc.nasa.gov/*, PBS Kids *http://pbskids.org/*, and National Geographic Kids, *http://www.nationalgeographic.com/kids/*, are examples of a great many sites that have been developed by national institutions to attract young people and provide learning activities related to their organizational missions.

Technology and Education Support

YOUTHLEARN
http://youthlearn.org

Youth Learn is an initiative of the Morino Institute now housed at Education Development Center. It provides resources and tools for creating learning programs enhanced with technology. Among these are the YouthLearn Guide, a newsletter, and an electronic discussion list. The YouthLearn website showcases examples of good project-based learning with technology, and enables visitors to access planning guides and teaching techniques, activities and projects for working with youth and technology, and other information and

advice on equipment and software. Visitors can also view and contribute to displays of children's creations, and link to other websites of organizations doing similar work with youth.

COMMUNITY TECHNOLOGY CENTERS' NETWORK (CTCNET)
http://ctcnet.org

CTCNet is a national, non-profit membership organization of more than 700 independent community technology centers. An important part of the mission of CTCNet is to offer "resources to enhance each affiliated agency/program's capacity to provide technology access and education to its constituency and to help and nurture other like-minded programs in its area. CTCNet will facilitate telecommunications, print, and in-person linkages enabling members to benefit from shared experience and expertise." For a small annual membership fee, members gain access to a national network of peers and expertise as well as all of CTCNet's services. CTCNet support includes an annual national conference, Leadership Development Institutes, national email discussion lists, a Start-up manual, online publications including impact studies, an annual Community Technology Review, and an Evaluation Toolkit. Many of these materials are freely available for downloading. One CTCNet initiative that may be of particular interest to Boston after-school providers is the CTC Support Project. According to a description on the CTCNet website:

In the Metro Boston region, the CTC Support Project is creating a replicable model that consistently addresses volunteer and operational needs of CTCNet affiliates by providing volunteer, technical, and other support. Goals include: development of a pool of available, skilled volunteers; volunteer placement in metro-Boston CTCs; contribution to the knowledge base and managerial decision-making in participating CTCs; compilation of useful evaluation data from pilot CTCs; and development of a well-documented, replicable model.

AMERICA CONNECTS CONSORTIUM
http://americaconnects.net

ACC brings information, training, technical assistance, public attention, and new resources to community technology centers nationwide. Resources available on the ACC website include information on starting and sustaining a community technology center; obtaining technology support, services, and training; accessing educational activities and tools; addressing disability and

inclusion concerns; and funding sources. The ACC site also provides a collection of free and fee-based online learning opportunities categorized under four headings: Business and Management, Education and Instruction, Technical Training, and Distance Learning Directories. Online panels are also offered by ACC, and archives of past panels can be accessed from the website. Among these are panels on the topics of Program Design, Literacy, Youth Leadership, and Evaluation and Assessment.

Electronic Newsletters

Several newsletters that are delivered by email could be rich sources of information for after-school providers.

The Scout Report, published every Friday by the University of Wisconsin-Madison's Department of Computer Sciences, contains short descriptions and links to websites dealing with topics in research and education, general interest, and network tools.

Current issues can be viewed at: *http://scout.cs.wisc.edu/report/sr/current/.* To subscribe to the Scout Report, go to: *http://scout.cs.wisc.edu/misc/lists/* or send email to: *listserv@cs.wisc.edu.* In the body of the message type: subscribe SCOUT-REPORT.

TechLearning News is a bi-monthly update published by the Consortium for School Networking (CoSN) and Technology & Learning. It contains news about current issues in education and technology and summaries of articles in Technology and Learning Magazine. It also has links to information about advocacy and leadership development, conferences, contests, and funding sources. Subscribe to this newsletter by sending a blank message to: *join-techlearning-newsletter1@lyris.mfi.com* or go to: *http://www.techlearning.com/content/resources/newsletter.html.*

The PEN Weekly NewsBlast is the property of the Public Education Network, a national association of 71 local education funds working to improve public school quality in low-income communities nationwide. Each issue of the newsletter features summaries and links to articles on education topics and lists grant alerts for both formal and informal settings. To view past issues of the PEN Weekly NewsBlast, visit: *http://www.publiceducation.org/news/signup.htm.* To subscribe, visit: *http://www.publiceducation.org/news/signup.htm.*

Technology and After-School Programs in Boston

A "Scan" of Technology Use in After-School Programs

While one study has identified the issues related to technology access and adult employment training programs for Boston's low- to moderate-income residents[24], and a few neighborhood surveys have been conducted by community-based organizations[25], there has been no citywide technology capacity survey of after-school programs.

A comprehensive survey of the technology access and usage in after-school programs in Boston is beyond the scope of this paper. However, we were able to review websites of many youth-serving organizations and schools in Boston, interview staff at representative programs and leadership agencies, and conduct a focus group at Bunker Hill Community College. Our "scan" provides an illustrative and analytical overview of how technology is used for learning in after-school programs in Boston.

Our research was guided by three questions:

- What technology programs are available at these sites?
- How is technology used for learning in after-school programs?
- What are challenges that after-school programs face in improving their technology programs for children and youth?

Technology programs for children and youth in after-school programs are taking place in three types of settings in Boston: community technology centers; community-based organizations (CBOs); and programs that are based in Boston municipal facilities, including schools and public housing. In addition to these, we will also examine technology programs conducted by the Boston Public Schools that relate to after-school programs.

[24] *The Center for Social Policy and Center for Community Economic Development, Beyond Access: Putting Technology Training to Work for Boston Residents, Technology Centers and Employers. University of Massachusetts, Boston, 2002*

[25] *For example, Codman Square Health Center developed the Community Technology Resource Guide www.tech4us.org/resources/index.shtml, which maps technology access in North Dorchester.*

Community Technology Centers

Since the early 1990s, the concept of a Digital Divide has been at the forefront of technology policy in the United States, particularly in large metropolitan areas.[26] Low-income individuals and families, ethnic minorities, and other underserved communities have significantly less access to technology than affluent communities and population groups. More significantly, there has been a growing concern that the digital divide may lead to a cognitive divide – the capacity to analyze and use information in a knowledge-based economy[27] – and further widening of the socioeconomic gap.

The City of Boston has been at the forefront of a resulting national policy to develop community technology centers in low-income communities. The mission of these community technology centers has been to provide convenient, free or low-cost, technology access to all community residents. Implicit in this mission of universal access has been providing basic technology training to enable users to access the Internet and to perform basic computer functions.

In a study conducted for Virtually Wired and the Women's Educational and Industrial Union, the Center for Social Policy and Center for Community Economic Development at the University of Massachusetts, Boston, have identified over 150 technology access centers in Boston, with a possibility of even more such access points not identified by their methodology.[28] These centers cover all neighborhoods in Boston and put every resident of the city within easy access of technology by foot or public transportation.

In 1995, the Community Technology Centers' Network (CTCNet) was established to provide support and technical assistance, leverage group power for purchasing and grants, and network sharing opportunities to community technology centers. There are currently more than 700 CTCNet members throughout the United States and in Africa, Europe, and South America.

[26] *Benton Foundation, "The Digital Divide." The Digital Beat 1 (8), July 1999. Available URL http://www.benton.org/DigitalBeat/db070899.html [last accessed June 20, 2002].*

[27] *International Information and Communication Technologies Literacy Panel, Digital Transformation: A Framework for ICT Literacy. Princeton, NJ: Educational Testing Service, 2002.*

[28] *The Center for Social Policy and Center for Community Economic Development, Beyond Access: Putting Technology Training to Work for Boston Residents, Technology Centers and Employers. University of Massachusetts, Boston, 2002, p. 15.*

There are more than 50 members in the Greater Boston area. See www.ctcnet.org for a list and links to Boston members. Our scan of Boston CTCNet members indicates a number of exemplary CTCs using technology in after-school programs, two of which are described here.

CODMAN SQUARE YOUTH AND TECHNOLOGY CENTER, CODMAN SQUARE HEALTH CENTER

As part of the CivicHealth Institute, CSHC houses its own youth programs, and plays host to programs of partner organizations. These programs are national models for engaging youth in technology. They include:

- The CyberShop, a design and graphics/web business that offers on-the-job training and experience to teens
- A hardware lab, a new facility where adults and teens learn to troubleshoot and repair computers and other hardware
- The ATLAS Project, providing homework support and tutoring, basic computer skill development, and preparation for SAT, MCAS and other standardized tests for students, ages 7–18 years old. This program is open Monday through Friday 2:30 p.m. to 6:00 p.m.

THE TECHNOLOGY CENTER AT TENT CITY

This center is based in a mixed-income housing development in the South End and was founded by long-time community activist Mel King. In addition to providing open access and basic skills training for all ages, the Tech Center has engaged youth in a number of out-of-school learning activities:

- For nearly five years, in partnership with TecsChange and independently, the center has run a computer repair and refurbishing course in which older youth frequently participate. The center runs related programming and technical courses on an ad hoc basis, based on client interest and the availability of volunteer instructors.
- Through an America Connects Consortium Field Innovation Grant, a group of teenagers spent six months involved in a research project. They analyzed the skills they needed to find web sites to support their play of complex computer games, and they tracked the different skills and knowledge they acquired as they moved from playing games to designing and building them.

Findings:

While community technology centers are likely to be rich in technology, they are less likely to have developed educational programs for children that have an academic skills focus. While there are examples of programs in CTCs that tie after-school activities to academic learning, such educational programming is the exception rather than the rule.

This finding is not surprising given that the main mission of community technology centers is to provide universal technology access. Funding for community technology centers has declined over the last several years. As a result, there is considerable tension in community technology centers as to whether they should maintain access hours and update their technology on the one hand or invest in developing more substantive programming on the other. Many agencies have had to choose open access over programming. The Virtually Wired/WEIU study has pointed out a similar pattern in terms of access versus employment training for adults. The study found that availability of employment training programs at community technology programs are sporadic because centers see their main mission as providing access, not education and training.[29]

Community-Based Organizations Serving Children And Youth

The growth of community technology centers has not been the only response to the digital divide in Boston neighborhoods. Since the proliferation of digital technology, many community-based organizations (CBOs) have added computers and Internet access to their offerings. The missions of these CBOs are programmatic to begin with. They serve children and youth by providing recreational activities, tutoring, and social development programs. These agencies added computer access in order to teach computers as a learning goal or to use technology to support their educational and youth development programming. One primary example is the Boys and Girls Clubs of Boston, which has established five Computer Clubhouses serving 8,000 children and youth. We distinguish these CBOs from community technology centers because of their origins and missions. For CBOs, youth programming is primary and technology access is secondary, the reverse of community technology centers' general priority.

[29] *Ibid.*

Dorchester

It would require an effort beyond the scope of this paper to conduct a technology survey of CBOs serving children and youth in Boston. Therefore, we focused on Dorchester as an illustration of what one is likely to find in any part of Boston. Dorchester is Boston's largest neighborhood and among its most diverse in ethnicity. Table 1 illustrates the hardware and the computer classes available at these sites. In a small number of these programs, only members have access to the computer technology. In most cases, however, the computer lab(s) that are used by the after-school program are also made available to the general public.

	ACCESS		TECHNOLOGY				CLASSES	
Organization	E=Eves	Fee	Computers	Print	Scan	Net	Basic	Inter.
Bird Street Community Center	Public, E	Usage	9 PCs	BW	x	x	x	x
Blue Hill Boys and Girls Club, Computer Clubhouse	Members only, E	Member	20 PCs	Color,BW	x	x		
Codman Square Health Center Neighborhood Center	Public	Free	9 PCs	BW, Color	x	x	x	
Dorchester ABCD/ Dorchester Neighborhood Service Center	Public	Free	34 PCs	BW, Color		x	x	x
Dorchester Center for Adult Education	Students only, E	Class	8 PCs	BW	x	x	x	x
Dorchester Temple Baptist Church	Students mostly	Free/Usage	38 PCs	BW, Color	x	x	x	x
Dorchester YMCA	Members only	Member, Class	42 PCs, 2 Macs	BW, Color	x	x	x	
Dorchester Youth Collaborative	Students mostly, E	Free	3 PCs	BW		x		
Ella J. Baker House	Public	Free	10 PCs	BW, Color	x	x	x	
Little House	Public, Students, E	Class	16 PCs, 1 Mac	BW, Color		x	x	
Log School	Students mostly Free	13 PCs	BW, Color	x	x	x	x	
Mo Vaughn Youth Development Program	Members only, E	Member	7 PCs	BW, Color				
Salvation Army Jubilee House	Students only	Free	2 PCs, 6 Macs	BW		x		
STRIVE Career Path	Students mostly	Free/ Usage	20 PCs	BW	x	x	x	x
Urban League of Eastern Massachusetts	Public (part time)	Free	34 PCs	BW	x	x		

The following examples of how technology is being used in after-school programs in CBOs illustrate that in most cases, it is but one component of a program rather than a central focus.

INQUILINOS BORICUAS EN ACCION, IBA, SOUTH END

IBA's Cacique after-school program in the IBA is new, serving 30-38 children between ages 6-13 (they are in the process of obtaining the license to increase their capacity). IBA has adjusted their programs to accommodate a population change in the community. While they used to serve only Latinos, they currently serve Chinese residents in Villa Victoria as well. The gender breakdown is 60 percent girls and 40 percent boys.

Children have access to the computer center two or three times a week from 2 PM to 6 PM. Programs offer structured training, classes, and modules to support students in completing school assignments and building specific skills.

In the daytime and evenings, IBA's El Batey Computer Center is used for a wide range of computer classess, including a CISCO certification training provided by a Bunker Hill Community College instructor. IBA's Technical Support Unit provides technical support to IBA's 3000 residents, many of whom are new owners of home computers.

ALIANZA HISPANA, ROXBURY

This after-school program in Roxbury serves 30 children, with a gender balance of 50 percent girls and 50 percent boys. The agency makes an effort to maintain gender balance. The students are all in middle school, 6th to 8th grades, ages 11-14. Eighty percent of the participants are Latinos. The after-school program schedule is structured as follows:

- Every day, from 3:30 to 4:30 PM: Snack and homework.
- Monday and Wednesday, from 4:30 to 5:30 PM: In two separate groups, girls and boys meet to discuss issues of their interest and to work on specific projects.
- Tuesday and Thursday: The academic program follows a "Whole Brain" learning approach, with an emphasis on fun. For example, a "Jeopardy activity" is used to help children learn math, history, and geography facts.
- Friday: The groups go on field trips, practice sports, or do other outdoor activities.

Children use computers for homework and research papers assigned by their schools. The Alianza Hispana after-school program features a balance between recreation and academics and a focus on boys only and girls only programming to respond to their needs and issues. It is a bilingual and bicultural program with parents involvement through parent workshops to discuss behavior and homework. There is a waiting list for the after-school program and Alianza Hispana would like to expand their program when more resources are available.

NEW ENGLAND SCORES

This after-school program serves 360 boys and girls, 40 percent of whom are Latinos. Programs are implemented in twelve Boston schools by school-teachers that are hired for the after-school initiatives. The program focuses on soccer, creative writing, and literacy with parents' participation, with limited use of computers.

INTEL COMPUTER CLUBHOUSE

The Intel Computer Clubhouse Network grew from the flagship clubhouse founded in 1993 at the Boston Computer Museum (now housed at the Museum of Science). As the network grew, a number of clubhouses were established in partnership with local youth-serving organizations, for example: the Boys and Girls Clubs of Boston, the Patriots' Trail Girl Scouts, and United South End Settlements. One of these Clubhouses is described below.

BOYS AND GIRLS CLUB OF BOSTON, BLUE HILL CLUBHOUSE

The Blue Hill Computer ClubHouse program serves 500 children and youth, with more girls than boys attending. This Computer ClubHouse is accessible to children over 8 years of age. The technology is web filtered, with monitoring by a technology instructor. The staff is bilingual and bicultural. Programs follow an open-ended, inquiry-based approach that is a hallmark of the Clubhouse philosophy: club members choose the programs they want to attend and work on projects that reflect their particular interests. In addition, a Clubhouse-to-College/Career program assists youth in developing job readiness, practicing resume writing, completing applications to colleges and universities, and touring higher education institutions.

Findings:

CBOs throughout Boston have progressed at a different pace in adding and integrating technology into their after-school programs. Many larger CBOs with the capacity to capitalize and support technology have computer labs. These labs serve multiple functions, including computer courses for adults, job-training programs, and ESL classes. Some after-school programs have been able to arrange computer access time for students. Programs such as the Intel Computer ClubHouses create an open environment of learner-driven activities. More structured learning programs aimed specifically at academic outcomes such as MCAS are uncommon. This finding is not surprising given that CBO staff lack training on using technology and using it to reach specific learning outcomes.

Programs In Boston Municipal Facilities

In partnership with neighborhood community-based organizations and residents, the City of Boston uses their facilities (e.g., schools, community centers, and public housing) to provide many human service programs, including after-school and technology programs for all age groups.

Our study focuses on two large programs undertaken by the City: The Boston Centers for Youth & Families (formerly known as Boston Community Centers, or BCC) and Boston Community Learning Centers (BCLC). Key staff for these two programs (Kevin Stanton and Dishon Mills, respectively) work in close collaboration. In addition, we discuss several Boston Public Schools initiatives that demonstrate the city's capacity to provide innovative out-of-school technology-based learning experiences for residents of all ages.

The Boston Centers for Youth & Families are a network of 43 facilities that provide a wide array of activities to over 65,000 Boston residents annually, making them the City's largest human service provider. We have identified 19 community centers that offer some kind of computer instruction, such as computer literacy; email and Internet; and introduction to office applications like Microsoft Word, Access, and PowerPoint. The sites include public housing centers (Archdale) and public schools (e.g., Blackstone, Quincy, Jackson Mann, and Madison Park). These centers are listed in Appendix A.

In the 2002-2003 academic year there are 31 school-based after-school

programs that are part of the Boston Community Learning Centers, as well as two community-based programs. BCLC provides funding that originates from a variety of sources, including the U.S. Department of Education 21st Century Community Learning Center program *http://www.ed.gov/21stcclc/*. These schools are listed in Appendix B. The following schools are examples of the type of technology activities taking place at BCLC schools.

PHINEAS BATES ELEMENTARY SCHOOL, ROSLINDALE.

The Boys and Girls Club of Boston operates an after-school program serving approximately 60 students. It provides homework help, literacy, math, arts and crafts, cooperative games, performance arts, conflict resolution, and character education. Students have access to computers up to three times per week, using them to develop essential computer skills and conduct research projects.

RAFAEL HERNANDEZ TWO-WAY BILINGUAL SCHOOL, ROXBURY.

The Hernandez School offers a variety of academic, recreational, and social activities. There are approximately 30 students per day attending the after-school program and technology is offered two times weekly. Close to 60 students cycle through technology classrooms each week.

BRIGHTON HIGH SCHOOL, BRIGHTON.

An average of 40 students participate in the Engineering Sciences Academy. In the after-school time, these students engage in such activities as web design, computer repair, and MCAS preparation with a Department of Education computer program. Students are self-directed and they work on projects related to their interests.

O'BRYANT GEAR UP, ROXBURY.

GEAR UP (Gaining Early Awareness and Readiness for Undergraduate Programs) is a national grant program supported by the US Department of Education. The primary goal of GEAR UP is to prepare students beginning middle school for successful entrance into college after high school. O'Bryant is one of eight GEAR UP programs throughout Boston that provide services such as academic tutoring, mentoring, college visits, enrichment programs,

parent outreach, and college awareness programs. The O'Bryant GEAR UP is an after-school tutoring program made up of teachers and tutors from O'Bryant and other colleges. The program on Mondays and Tuesdays is snack, homework (45 min), Projects (45 min). The technology program includes PowerPoint and Web Page Design along with Journalism, Law/Mock Trial, Cinematography, and Drawing Techniques.

Findings:

After-school program personnel are only at the beginning stages of finding out how technology programs can fit into their program priority. They recognize that providing technology access to students is important in the Information Age.

Those after-school programs based in Boston Public Schools have a unique opportunity to leverage the existing infrastructure: all BPS facilities have at least a starter computer network and one up-to-date computer lab with Internet access and computers that are loaded with a standard set of Microsoft Office applications and other age-appropriate learning software (such as Inspiration, KidPix, HyperStudio, and Math Type). Some schools may have used their software budget to purchase additional software based on their course offerings (e.g., Macromedia Dreamweaver or Flash for a web design course).

Even when after-school programs have access to the school's computer labs and use the labs for individual student projects and homework, they generally do not have the resources to train staff and to develop structured learning activities for elementary and middle school students. Instead, they rely heavily on the school's computer instructional staff and trained para-professionals to provide support and instruction in the labs.

School-based after-school programs at the high school level generally engage students who are interested in technology careers to participate in self-directed technology projects.

Boston Public Schools

In 1996 the BPS accepted the challenge issued by Mayor Thomas M. Menino: to increase the computer to student ratio and to network every school, public library and community center. The initiative, called the LINC (Learning and Information Network for Community) Boston Plan, was extraordinarily successful. By 2001, the computer to student ratio was 1:5 and all the libraries and community centers were wired (including Timothy Smith Trust Fund supported computer learning centers).

The following policy direction, listed under Essential Six Goals, relates to Boston after-school programs:

LEARNING AND INFORMATION NETWORK FOR THE COMMUNITY (LINC BOSTON II)

http://boston.k12.ma.us/linc2/lincdraft9_20.doc

In 2001, the Boston Public Schools adopted LINC Boston II as a new five-year (2001-2006) technology plan to support the unifying goal of Boston Public Schools' education reform plan. LINC Boston II outlines a plan to "use technology to continue student and adult learning at school, at home, and in the community, at any time of day."[30]

The part of the plan that is relevant to after-school programs is Essential Six: Technology Supports Family and Community Engagement. It provides a framework for all schools to work with community organizations in using technology to improve student learning outside of school.[31] LINC Boston II has included the following policy directions in its Essential Six Goals that is relevant to Boston after-school programs:[32]

- Schools will work closely with the Mayor's 2:00-to-6:00 After-School Initiative, the City's Office of Community Partnerships and other resources to engage students in educational and social activities beyond the school day.

[30] *Boston Public Schools, LINC Boston II: Comprehensive Technology Plan to Support Focus on Children II, p. IX. http://boston.k12.ma.us/linc2/lincdraft9_20.doc*

[31] *Ibid., pp. 63-66.*

[32] *Ibid., p. 65.*

In addition, LINC Boston also set the following directives:[33]

- Principals and headmasters will be held accountable for setting goals and developing strategies to engage families and partners in the schools.
- Strong partnerships between schools and a variety of businesses, universities, human service providers and cultural institutions will support the schools' performance goals.

Moreover, it identified the following steps in support of the Essential Six Goals:[34]

- Develop a program to provide TechBoston students with internships at community-based organizations to provide students with work experience and CBOs with support resource.
- Create a formal program to open computer labs at selected schools to CBOs with appropriate guidelines to ensure security and integrity of school resources.
- Develop a program to facilitate schools' participation in the Technology Goes Home program to increase the availability of computers to students outside normal school hours.
- Collaborate with the Digital Bridge Foundation to expand access to technology for all Boston students and families.

Moreover, while the LINC Boston initiative improved the computer-student ratio, LINC II the Future will improve it yet again to 1:4. In addition, each classroom will have at least one networked computer. This means that after-school programs may want access to computer labs and/or classroom computers.

TECHBOSTON

TechBoston provides high quality, hands-on technology education to BPS students to prepare them for careers and post secondary opportunities in technology. It creates opportunities through internships and scholarship opportunities for students, including computer repair, networking, web design and other aspects of the information technology industry.

[33] *Ibid.*
[34] *Ibid., p. 65-66.*

The TechBoston Consulting Group provides TechBoston students the opportunity to utilize learning in real world situations. It has two lines of business:

- website design and maintenance
- computer support assistance

BPS juniors and seniors who are active in advanced technology courses work on and/or off site and are supervised by a TechBoston teacher.

TECHNOLOGY GOES HOME

The mission of Technology Goes Home, which is supported by the Boston Digital Bridge Foundation, is to bring technology into the homes of low-income families. This program helps adults with access to job and career opportunities and children with their academic work. It also helps link families together through intergenerational training and shared interest in technology. Technology Goes Home currently operates in Codman Square, Allston-Brighton, Dudley and Lower Roxbury and other Boston neighborhoods. Every family that completes the training receives a computer, a modem, a printer, and free Internet access.

MYBPS

BPS administrators and faculty have access to several information systems that allow them to access and share critical data and best practices. In particular, there are two existing systems that after-school programs could benefit from – LIZA (Local Intranet Zone for Administrators) which provides student and school performance information and MetroLINC which connects teachers in a community of practice. A central element of LINC II the Future is the development of a single portal, MyBPS, that will provide these kinds of information to everyone involved in the development of Boston's school-age children: teachers and administrators, students, and parents/guardians. There are plans to extend access to critical student information to after-school program and community center staff.

Findings:

It is clear that Boston Public Schools is in support of extending the availability of its technology infrastructure to the community. This is true on the policy and planning level. The challenge is to extend the collaboration and partnership to every school. Through interviews with school-based after-school providers, we learned that one critical success factor is the support of the computer instructional staff. These teachers and para-professionals must be willing to open their labs and libraries to the after-school programs, and to provide leadership to the after-school programs staff for the integration of technology into their programs.

Challenges

After-school providers were asked about the challenges they faced with regard to using technology in their programs. Their responses included the acquisition and management of technology, staffing, facilities, and curriculum materials.

Acquisition and Management of Technology

Technology is not 'forgiving.' If one thing goes wrong, the whole thing doesn't work.[35] Obtaining funding and/or material donations is a perpetual concern for community-based after-school programs. For those who choose to integrate technology, identifying and obtaining the appropriate forms of hardware and software are additional issues. Once obtained, day-to-day management and maintenance, as well as periodic upgrading, become further issues. Security involves protecting hardware devices from theft, vandalism, and other forms of physical damage. It also involves protecting digital assets from viruses, worms, and other invasions from outside agents as well as protecting children from potential threats to their safety that can result from Internet-based activities.

[35]*comment from focus group participant at Bunker Hill Community College conference, June 2002*
[36]*comment from focus group participant at Bunker Hill Community College conference, June 2002*

Staffing

Training staff and converting staff who are not proponents of technology is a big concern. Lack of funds and time make this very difficult.[36] Recruiting and retaining staff are major issues for after-school programs. Although program administrators may stay in their position for years at a time, the rate of turnover for staff who work with children on a day-to-day basis is typically quite high. Finding and keeping staff with good technical skills adds to the challenge. Further challenge is presented when staff must also support children's learning in effective ways. Of necessity, given the hours of operation and the limited funding that typifies such programs, staff are part-time and at the bottom of the pay scale, or serve as volunteers. Because in-service training is rare, the kinds of programs that can be offered to children depend on the skills, prior training, and interests of the staff. Staff with technology skill are especially hard to retain because such skill is valuable in the commercial sector as well.

Facilities

Existing computer labs are designed for individual learning, making it hard to demonstrate things to a group of kids or support collaborative activities.[37] The most common complaint voiced in after-school programs is the lack of connection and coordination between the school and after-school staff regarding the use of facilities and equipment.[38] Borrowed or temporary space prevents programs from tailoring an environment to make it a special place for children, where they can feel comfortable, welcome, and have a sense of ownership and participation.

Curriculum Materials

Staff priorities are to carry out essential operating tasks. Consequently, doing the 'neat stuff' with kids gets neglected. Time to develop 'new stuff' isn't there.[39] Providing technology access requires an additional commitment to selecting curriculum and designing activities that will meet students' needs. Careful planning must be done to make the best use of the hardware and software that is available and to determine what else needs to be acquired.

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[37] *comment from focus group participant at Bunker Hill Community College conference, June 2002*

[38] *U.S. Dept of Education Safe and Smart: Making After-School Hours Work for Kids – June 1998, Chapter 2, entitled What Works: Components of Exemplary After-School Programs. Available URL [last accessed 5/10/02]*

[39] *comment from focus group participant at Bunker Hill Community College conference, June 2002*

Looking Forward

Boston after-school programs clearly recognize the potential of technology in contributing to teaching and learning. But they also recognize that technology brings its own set of challenges, much of which seems to be beyond their limited resources in personnel and funding. These include hardware and software acquisition, technical management and support, training and professional development, and, for those in Boston Public School buildings, collaboration and coordination with the school technology staff. Community technology centers need continuing support not only in updating and expanding technology access, but particularly in developing after school learning and instructional programs. Community-based organizations with a history of youth programs require not only assistance in integrating technology into their instruction but especially in acquiring technology and in computer skill and competence. Both types of agencies need support in using technology integration to achieve specific learning goals and student outcomes.

These pragmatic issues are a daily reality for after-school programs. However, they can be addressed and ameliorated given the vast amount of resources available. These include best practice models, curriculum resources, networking and sharing opportunities, and technical assistance.

Recommendations

Our recommendations address short-term and long-term outcomes. The short-term recommendations are pragmatic, cost-effective tasks that can have immediate impact. The long-term recommendations are made with an eye toward establishing a sustainable citywide system of after-school programs that effectively use technology for learning. This system can serve as a national model for technology use in after-school programming.

Short Term

Recommendation 1: Work in collaboration with Boston Public Schools.
It is clear from the LINC II plan that Boston Public Schools is heading in the same direction as the Partnership in terms of expanding the availability and use of technology for learning beyond the school hours. To develop an appro-

priate response to these positive directives and steps, the Partnership needs to:

- Conduct outreach to principals, headmasters, and School Site Councils on the merit and importance of learning through technology in after-school programs. Work with them to open doors to their technology labs, classroom computers, and other technology resources; and to make available the assistance of technology coordinators, computer instructors, or teachers skilled at teaching using technology.
- Develop a formal agreement with TechBoston for reliable IT support to after-school programs, including helpdesk support, maintenance, and technology training.
- Work with the Technology Goes Home program to involve after-school programs, students, and their families in this program.
- Identify after-school programs that have access to school computer labs or want to have access. Work with them and the schools to develop guidelines to ensure security, maintenance, and effective use of the facility.

Recommendation 2: Coordinate, facilitate, and provide technical assistance and material resources to after-school programs. As indicated in the section of resources, there are ample resources and technical assistance for after-school programs to access. However, many after-school programs do not know about them or believe that it takes more time and effort to find and use help than it is worth.

There is no need to reinvent the wheel in terms of technological support and material resources. What is needed for cost-effective impact is to bridge existing resources to after-school program providers. Three major national technical assistance providers are located in the Boston area: CTCNet, YouthLearn, and America Connects Consortium. CTCNet was a project of Education Development Center (EDC) before it was established as a non-profit agency. YouthLearn and America Connects Consortium are currently programs of EDC.

The Partnership can play a pivotal role in encouraging and enabling after-school programs to use available resources. In addition, the Partnership should make available direct technical resources to fill in the gaps that the national technical assistance providers cannot focus on. Local technical assistance should be made available when strategic tailoring of assistance is required.

After-school programs need the following types of assistance:

- Professional development, including developing a system of credentialing in learning technology so that staff will be rewarded with better pay
- Hardware and software acquisition
- Fund raising strategies and grant resources
- Curriculum resources, particularly how to access them from the Internet and evaluate appropriate instructional materials for their programs
- Learning goals and learner outcomes, including how to develop appropriate technology integration strategies to reach the identified learning goals; particular attention may be paid to the Boston Public Schools standards and frameworks.
- Evaluation methodologies and tools

Recommendation 3: Build a network of after-school programs in Boston.

To support the work in previous recommendations, after-school programs need to organize themselves into a collaborative network with a leadership team and staff support. The function of this network will be to:

- Facilitate sharing of information, planning, and activities
- Provide staffing support
- Negotiate lower, volume-based, rates for fee-based services and training
- Work with BPS and the City to ensure that all after-school programs have access to the MyBPS portal
- Use existing BPS and City intranets (LIZA, MetroLINC, MyBPS) as a model for an electronic learning community that focuses on issues related to technology integration in after-school programs. This electronic learning community may include:
- A discussion board for sharing information
- A website that disseminate information about the Partnership, including best practices
- Resource pages that includes resources developed by members of the network
- Online courses for professional development
- A contact point (and mail link) for suggesting/volunteering resources for members of the network
- A peer-review process for available learning resources, similar to reader book reviews on Amazon.com

Recommendation 4. Establish grants with a priority toward supporting technology for learning. The Partnership should make using technology for learning a major priority in its support of after-school programs. A key criterion for funding is that the applicant must clearly define the learning goals to be achieved and connect the use of technology to the identified learning outcomes. The Partnership may also wish to:

- Fund pilot programs with strong educational vision and capacity to implement learning activities using technology. These programs can serve as leadership sites for the Boston-wide electronic learning community.
- Incubate new programs targeting underserved populations (e.g., homeless children, recent immigrants, incarcerated youth, and disabled children). These programs can serve as critical test cases and potential best practices for using technology integration to assist difficult-to-serve populations.
- Create a scholarship fund to support after-school staff participation in training.

Long Term

In the long term, the Partnership may wish to develop a Boston-wide vision for technology integration in after-school programs. This vision should clearly delineate that technology is an important factor and tool in achieving the learning goals of after-school programs of today and tomorrow. The vision should create a central mission for all programs in terms of technology integration, and at the same time allow individual programs the flexibility to pursue various learning goals using technology. After-school programs should have a role in creating and promulgating this vision. They should feel ownership of this system-wide vision.

Having bought into the vision, after-school programs then have the responsibility to clearly define their learning goals and connect appropriate technology (including hardware, software, connectivity, and environment) to the goals. In addition, they have the responsibility to determine specific tangible and/or measurable learner outcomes resulting from use of technology. Technology should not be obtained for the sake of having technology. After-school programs would have to think clearly about using technology effectively to reach desired educational impact.

Moreover, the Partnership may wish to develop a vision of national leadership and make Boston a national model of citywide collaboration and collective advancement. To achieve this goal, action, research, monitoring and studying the Partnership's technology initiative in support of after-school programs will need to be done.

APPENDIX A: COMPUTER CLASSES AT BOSTON CENTERS FOR YOUTH & FAMILIES

CENTER	COMMUNITY	CLASSES OFFERED	SCHEDULE
Archdale	Roslindale	Windows, Word, PowerPoint and Excel	M, T, Th, F 9:00 A.M. - 1:00 P.M.
		Personal Tutorials	M - F 2:00 - 4:30 P.M.
Blackstone	South End/Back Bay	Computer Literacy Program	T & Th 1:00 - 2:00 P.M.
Curley	South Boston	Windows 95, Internet Explorer, Word 97, PowerPoint	M - F 9:30 - 11:00 A.M.
		E-Mail, Intro to Computers	M - F 8:00 - 9:30 A.M.
Curtis Hall	Jamaica Plain	Intro to Computer	November/W 11:00 - 12:00 P.M.
		Intro to Windows	November/W 11:00 - 12:00 P.M.
		Intro to E-mail	December 1st/F 12:00 - 1:00 P.M.
		Intro to PowerPoint	January 2001 6:30 - 8:00 P.M.
		Intro to Word	January 2001 6:30 - 8:00 P.M.
		Intro to Access	January 2001 1:00 - 2:30 P.M.
		Intro to Excel	January 2001 1:00 - 2:30 P.M.
		Intro to Internet	December - February 11:00 - 12:00 P.M.
		Intro to Business	December - January 1:00 - 2:00 P.M.
Gallivan	Mattapan	Open Computer Center	M,W, F 9:00 A.M . - 6:00 P.M. T & Th 1:00-9:00 P.M.
Harborside	East Boston	Computer Classes	F 4:00 - 9:00 P.M.

APPENDIX A: COMPUTER CLASSES AT BOSTON CENTERS FOR YOUTH & FAMILIES cont.

CENTER	COMMUNITY	CLASSES OFFERED	SCHEDULE
Hennigan	Jamaica Plain	Computer Lab	M - F 3:00 - 6:00 P.M. & 6:00 - 9:00 P.M.
Hyde Park	Hyde Park	Intro to Computers & Computer Operations	M, T, W, Th 9:15 A.M. - 12:15 P.M.
		Excel	M & W, T & Th 9:15 - 12:15 P.M. & 5:00 - 8:00 P.M.
		Open Access	M - Th & F 1:00 - 4:00 P.M.
		Word	M & W, T & Th 9:15 - 12:15 P.M.
		Windows 95/NT	M & W, T & Th 5:00 - 8:00 P.M. & 9:15-12:15 A.M.
		ESOL Student Class	T & Th 11:00 - 12:00 P.M
Jackson Mann	Allston/Brighton	Intro to Computer Skills	TBA
		Open Computer Access	TBA
Madison Park	Roxbury	Computer Lab Access	M - F 2:30 - 8:30 P.M
Tobin/Mission Hill	Mission Hill/Roxbury	Computer Center	M - F 10:00 A.M. - 6:00 P.M.
Murphy	Dorchester	Workshops (ie,Excel Shredsheet)	Sat 10:00 - 1:00 P.M.
		Beginner	M - Th 6:30 - 8:30 P.M.
		Intermediate	M - Th 6:30 - 8:30 P.M.
Ohrenberger	West Roxbury	Beginners I	T 7:00 - 9:00 P.M.
Orchard Garden	Roxbury	Intro to Computers	T - Th 5:30 - 7:00 P.M.
		Microsoft Word	T - Th 5:30 - 7:00 P.M.
Perkins	Dorchester	Computer Lab	M - F 3:00 - 5:30 P.M.
		Teen Computer	F 3:30 - 8:30 P.M.
		GED Computer Lab	M - Th 6:00 - 9:00 P.M.

APPENDIX A: COMPUTER CLASSES AT BOSTON CENTERS FOR YOUTH & FAMILIES cont.			
CENTER	**COMMUNITY**	**CLASSES OFFERED**	**SCHEDULE**
Quincy Boston Chinatown	Chinatown	Adult ESL Program (computer instruction)	M - Th 1:00 - 8:00 P.M.
Roche	West Roxbury	Beginning Macintosh	W 10:00 - 11:00 AM
		Intro to the Net	T - Th 6:00 - 7:00 P.M.
Roslindale	Roslindale	Computer Classes	T & Th 6:30 - 8:00 P.M.
		Open	T & Th 3:00 - 5:00 P.M.
		Newspaper/Graphics	M 3:00 - 5:00 P.M.
		GED	M & W 6:00 - 9:00 P.M.
		Youth Classes	W & F 2:45 - 5:45 P.M.
		Seniors	M & W 10:00 - 11:30 A.M.
Shelburne	Roxbury	Computer Learning Center	M - F Sat 12:00 - 6:30 P.M. & 10:00 A.M. - 1:00 P.M.

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Bates Elementary School – Jane Southwick

Boston Arts Academy – Peter McCaffrey

Boston Community Centers – Dishon Mills

Boys and Girls Club – Daphne Griffin (Blue Hills/Dorchester Clubhouse)

Brighton High School – Charles Skidmore

Citizen Schools – Angel Dos Santos

Guild Elementary School East Boston – BCLC Coordinator, Patty Bradley

Computer Clubhouse – Stina Cooke

Codman Square Cyber Shop – Kate Snow

Dorchester High School – Edner Cayemite

Inquilinos Boricuas en Accion (IBA) – Lorena Monquella and Zobeida Vides

New England Scores – Kathy Fitsgerald

Rafael Hernandez Two-Way Bilingual School – Ken Larson

ROCA (Chelsea) – Victor Santana

Street Level Youth Media – Tony Streit

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Boston's After-School for All Partnership

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FleetBoston Financial Foundation
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Massachusetts 2020
Nellie Mae Education Foundation
New Profit Inc.
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United Way of Massachusetts Bay
Verizon

DESIGN: CAROL MAGLITTA IN PARTNERSHIP WITH BARBARA GAZLEY

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