U.S. DEPARTMENT OF COMMERCE National Telecommunications & Information Administration

Evaluation of the Telecommunications and Information Infrastructure Assistance Program

Case Study Report

L.E.A.P. National Youth Center Networking Project (NYCN) 94002

New Haven, Connecticut

Site Visitors: Joan Michie and Nancy Speicher

Dates of Visit: February 18-19, 1998

PREFACE

On behalf of the National Telecommunications and Information (NTIA), I am pleased to share the following report that is one of a series of case studies conducted on grants awarded by the Telecommunications and Information Infrastructure Assistance Program (TIIAP) in 1994 and 1995. The case studies are part of the program's evaluation effort designed to gain knowledge about the effects and lessons of TIIAP-funded projects. NTIA contracted Westat, a research and consulting firm, to perform an independent evaluation of the program's first two years of grants. The evaluation consisted of a mail survey of 206 grant recipient organizations and in-depth case studies of selected projects. In February, 1999, the Commerce Department released Westat's evaluation report.

The projects selected for the case studies cover a broad range of program types and sizes, planning grants as well as demonstration grants, and they show varying degrees of implementation, sustainability, and replication. Westat selected the projects to represent a cross-section of all projects funded in the program's first two years. Specific selection criteria included geographic region, target population, project application area, project category, and size of award. To conduct each case study, Westat reviewed all project files, including progress reports and the final report, and conducted site visits. The site visits consisted of project demonstrations and interviews with project staff, representatives of partner organizations, and project end users.

NTIA thanks the case study participants for their time and their willingness to share not only their successes but their difficulties, too. Most of all, we applaud their pioneering efforts to bring the benefits of advanced telecommunications and information technologies to communities in need. We are excited about the case studies and lessons they contain. It is through the dissemination of these lessons that we extend the benefits of TIIAP-funded projects nationwide.

We hope you find this case study report valuable and encourage you to read other TIIAP case studies. You may obtain additional case studies and other TIIAP publications, including the final Westat evaluation report, through the NTIA web site (www.ntia.doc.gov)_or by calling the TIIAP_office at (202) 482-2048. We also are interested in your feedback. If you have comments on this case study or suggestions on how TIIAP can better provide information on the results and lessons of its grants, please contact Francine E. Jefferson, Ph.D. at (202) 482-2048 or by email at fjefferson@ntia.doc.gov.

Larry Irving Assistant Secretary for Communications and Information

TIIAP CASE STUDY

L.E.A.P. National Youth Center Networking Project (NYCN)

"The goal of the teaching staff at the L.E.A.P. Computer Learning Center is to engage children from highpoverty neighborhoods in Internet-based, multimedia projects that focus upon the themes of leadership and community awareness. Through the utilization of electronic communications L.E.A.P. children will act as the eyes, ears and voices of their communities. It is our hope that the participation of our children in such projects will allow them to understand the capacity of technology to enhance the art of communication, facilitate self expression, and highlight their roles as leaders in their own communities."

> Mission Statement L.E.A.P. Computer Learning Center

A. EXECUTIVE SUMMARY

L.E.A.P. is an after-school and summer program for low-income African American and Latino children aged 7 through 14. The program is headquartered in New Haven, Connecticut, where 500 children are served. Additional centers are in Hartford and New London, each of which serves about 200 children.

L.E.A.P. is primarily an educational program that uses a reading-based learning model, designed to excite children about learning. It has developed a nationally recognized curriculum for its targeted population.

L.E.A.P.'s TIIAP project was designed around specific objectives:

- "Train youth center staff in the use of electronic communications and emerging computer technologies;
- Develop and implement curricula focused on electronic communications and emerging computer technologies for use in youth centers serving low-income communities;
- Build a repository of information about youth center programs, curriculum models, drug abuse programs, counseling and intervention programs and training courses, to be accessed and supported by youth center staff, clients and the community at large;
- Establish a national network linking youth centers across the country to facilitate access to the repository and communication among youth center staffs and clients;
- Build community electronic leadership skills through the training and employment of high school aged low-income youth in youth centers; and
- Sponsor an annual youth center networking conference at which youth center staffs and clients will share programs, ideas, and experiences regarding the application of networking technology in community youth centers."

Under the TIIAP grant, L.E.A.P. got a high bandwidth server, and every computer was connected to a network. E-mail and web browsers became widely available, and staff were trained in the use of e-mail and web access. They make extensive use of these resources today.

L.E.A.P.'s Computer Learning Center (LCLC), which opened shortly before the TIIAP project began, developed a curriculum that it published on the World Wide Web. As a part of the project, L.E.A.P. and Plugged In in California conducted a collaborative Internet project. Since the TIIAP project was completed, L.E.A.P. has expanded LCLC services to Hartford where they are community based. One week after the site visit, an LCLC was due to open in New London.

During TIIAP, the project piloted a school partnership program that has evolved into a formal school partnership. In addition, the project conducted a conference entitled "Risks and Opportunities for Children and Their Advocates on the Information Super Highway," held in connection with the Children's Defense Fund's (CDF) annual conference in 1996. It also coordinated several technology workshops during the CDF conference and operated an Internet demonstration laboratory during both the presession and the regular conference.

As a part of the project, the National Youth Center Network (NYCN) was established, and 10 organizations involved in youth services became charter members. Each member developed a project related to at least one of the goals of the TIIAP project. Information about NYCN was put on the World Wide Web. The network piece of the project has not continued beyond the TIIAP grant because it is beyond the fiscal capacity of L.E.A.P. to maintain it.

Among the lessons learned by the project were the following:

- The organizations participating in the NYCN were very different from each other. As a result, L.E.A.P. staff found that there was no easy way to keep them organized. They suggested that if the organizations had all been at the same level, it might have been better. The commitment of the organizations varied, as did the money they had available and their understanding of the project.
- Instruction in web searching should be provided by trained teachers or counselors, not by technical people.
- Collaborative projects need to factor in time spent in planning and in debriefing. Because of the amount of time required, it is difficult to put a volunteer or even a college student working part time in charge.
- Backup activities are needed for when the equipment fails or a website can't be accessed because it is down or so many people are trying to use it.
- Community partners are important. They have been helpful in securing space and providing wiring.
- Learning goals need to be clear. Technology must be integrated into the lessons.
- The focus should be on people and on staff development, rather than on the technology.

B. OVERVIEW

Purpose and General Approach

The purpose of the project was to demonstrate how electronic communications could be made accessible to low-income communities. The objectives defined in the proposal are shown below. (We would be more apt, however, to call them project goals.)

- "Improve how community institutions and their staffs communicate, both internally and externally, by providing a meaningful and usable vehicle for exchange of techniques, successes and experiences;
- Develop technology leadership and expertise within and through the youth centers;
- Engage the youth these centers serve in the use of electronic communications to help them reach out, to learn and develop, at the same time that they provide the ongoing support critical to the effort;
- Encourage communications software vendors to develop products to meet the needs of these communities; and
- Provide a compelling model of success that will attract major sponsors and innovators."

The L.E.A.P. proposal described the following "process" for addressing the objectives. We would be more apt to call them the specific project objectives.

- "Train youth center staff in the use of electronic communications and emerging computer technologies;
- Develop and implement curricula focused on electronic communications and emerging computer technologies for use in youth centers serving low-income communities. This curricula will address: a) electronic literacy, including technical skills; b) educational skills, including reading, writing, mathematics and research; and c) social skills, including group dynamics, self-esteem development, and expansion of the children's known world;
- Build a repository of information about youth center programs, curriculum models, drug abuse programs, counseling and intervention programs and training courses, to be accessed and supported by youth center staff, clients and the community at large;
- Establish a national network linking youth centers across the country to facilitate access to the repository and communication among youth center staffs and clients;
- Build community electronic leadership skills through the training and employment of high school aged low-income youth in youth centers; and
- Sponsor an annual youth center networking conference at which youth center staffs and clients will share programs, ideas, and experiences regarding the application of networking technology in community youth centers."

Description of Grant Recipient and Project Partners

Grant Recipient. L.E.A.P. is an after-school and summer program for low-income African American and Latino children aged 7 through 14. The program is headquartered in New Haven, Connecticut, where 500 children are served. Additional centers are in Hartford and New London, each of which serves about 200 children.

L.E.A.P. is primarily an educational program that uses a reading-based learning model, designed to excite children about learning. It has developed a nationally recognized curriculum for its targeted population, which is structured around eight pillars: reading, group cooperation, science/math, self-worth, community/community service, health, athletics, and arts.

The participating children are served in groups of eight with one college student (senior counselor) and one high school student (junior counselor) in each group. Altogether, 115 college and 115 high school students work with the program. Junior counselors mentor the 7- to 14-year-olds and are themselves mentored by the senior counselors. Most of the administrative staff of L.E.A.P. were former counselors.

The students were originally recruited door-to-door within set boundaries that comprised low income neighborhoods. The program has been in most neighborhoods for 3 to 6 years, so little additional recruitment is necessary. Once students become a part of L.E.A.P., they stay in the program and grow with their group. Counselors generally participate for the academic year and through the following summer. During the summer, the college counselors move into the neighborhoods where the children live, an arrangement made possible through a partnership with the Public Housing Authority. They make weekly visits to the children's homes and provide 24-hour accessibility.

The summer session lasts 8 weeks, and children receive at least 40 hours of services each week. During the school year students receive up to 15 hours of services each week. Every session is supposed to include at a minimum a "read-aloud," journal writing, an educational activity that complements scholastic exercises, homework help, and recreation time.

In New Haven, L.E.A.P. activities mainly take place in space donated by the public school system. L.E.A.P. provides transportation for students to come to the L.E.A.P. Computer Learning Center (LCLC) from the schools. Two groups at a time come to the center. In Hartford, all L.E.A.P. services are neighborhood based. The program occupies a unit in each of two public housing complexes. Each center serves 12 groups of children.

L.E.A.P. had very little exposure to electronic networks prior to the TIIAP project. Only two e-mail and dial-in connections were in place, and staff were in the process of negotiating with Yale University to bring in a high-speed line. The curriculum was based on software, e.g., Hyperstudio.

Project Partners

Original partners

• **Morino Institute** – The Morino Institute, based in Reston, Virginia, "works to find and cultivate ways in which interactive communications can be used to benefit society, empower individuals, and create opportunity." Groups targeted by the Institute include the economically and educationally disadvantaged.

• **Plugged In** – a program in East Palo Alto, California, with multiple youth centers providing computer training to low-income youth. This program received a TIIAP grant in FY 1995.

Additional partners

- Eight other youth center organizations became partners in the National Youth Center Network (NYCN), the development of which was one of the TIIAP project objectives.
- **CompuMentor** San Francisco-based nonprofit organization that provides computer networking education and consulting services to other nonprofits.
- **Playing to Win Network** The Network, located in Newton, Massachusetts, runs a community-based technology learning center and has a framework for sharing the results of its efforts. (The network has since been retitled CTCnet; see www.ctcnet.org.)

Project Costs

Total project cost: \$449,638

Federal contribution: \$203,493

Sources of matching money:

- L.E.A.P. in-kind and personnel support
- Plugged In in-kind personnel support
- Morino Institute direct cash and in-kind support

C. PROJECT CONTEXT

Community Description

New Haven is one of the poorest cities in the country and meets the eligibility requirements for Community Empowerment Zone status. The city has high unemployment and much drug-related gang activity. The high school dropout rate is around 50 percent.

At the same time, the city has resources such as Yale University. Many of the L.E.A.P. senior counselors are Yale students, who value participation in such an effort.

Status of Telecommunications/Information Infrastructure Environment Prior to the TIIAP Project

The New Haven schools have very limited computer resources. The equipment purchased 10 years ago is still in use. Most schools, but not all classrooms, are connected.

Because of the efforts of a newly hired head of the public library, 1997-98 has been the first year with significant web and e-mail accessibility at the central library. These resources are not yet available in the branch libraries.

D. PROJECT IMPLEMENTATION

Activities/Milestones that Occurred Prior to the TIIAP Grant Period

L.E.A.P.'s Computer Learning Center (LCLC) was established with the mission to "teach basic computing skills and understanding of computing technology; enhance general communication skills: reading, writing, and verbal fluency; develop social skills through collaborative projects; and promote electronic communications literacy." In March 1994, the program coordinator for the new LCLC visited Plugged In in East Palo Alto and several other similar programs. The LCLC itself was opened on July 1, 1994, 3 months before the program applied for TIIAP money. Funding for these early activities came from Echoing Green in New York and Mario Morino. (The latter provided funds as an individual, since the Morino Institute was just being established.) Space for the LCLC was donated by Yale University. Donations from foundations, corporations, and individuals were used to purchase the computer hardware.

Activities/Milestones that Occurred During the TIIAP Grant Period

Under the TIIAP grant, L.E.A.P. got a high bandwidth server and every computer was connected to a network. E-mail and web browsers became widely available.

In the first and second quarters, training was provided to staff of the LCLC as well as the junior and senior counselors. This training was based on a 3-week training at Plugged In attended by the LCLC director. Later, the rest of the L.E.A.P. staff were trained in the use of e-mail and web access.

The LCLC has an open house each Wednesday night for the entire L.E.A.P. community, including parents, children, counselors, and administrative staff. A workshop on a particular software or Internet resource is the focus of each open house, but assistance is provided on other resources as well. On Sunday afternoons, L.E.A.P. children may drop in to the LCLC.

The LCLC developed a curriculum that it published on the World Wide Web. As a part of the project, Plugged In's curriculum also was put on the web. Along with reading and writing, doing research and using new technology to do it became L.E.A.P. fundamentals. Examples of the types of activities conducted in the LCLC are The Heritage Calendar and Think GlobaLEAP, conducted in fall 1995, which are shown in the Appendix.

The LCLC and Plugged In conducted a collaborative Internet project in fall 1995. The purpose of the project was to demonstrate how the World Wide Web could be used as a teaching tool and to engage students from the two locations in the same project. The project, called "On the Road," had both sets of 9-to12-year-old students participate in a virtual road trip. At stops along the way, the students investigated some facet of the location such as geography, art, and government. As a part of this 6-week project, students wrote a travel journal that included both text and drawings, used e-mail, and solved problems that required them to search for information.

During TIIAP, the project piloted a school partnership program. It involved a third grade teacher in one school and a second grade teacher in another. Children from the pilot classes came to the LCLC once

per week. This program has evolved into a formal school partnership in which the LCLC works with all the teachers in a school for a semester or a year.

To develop the network of youth centers, L.E.A.P. held a planning meeting on January 21-22, 1995, attended by 29 people from 15 relevant organizations. Before the meeting, a survey was sent to the organizations to determine their use of electronic communications technology prior to the project. The survey results showed that the organizations that directly interacted with youth had limited access to e-mail and the Internet, whereas all the organizations that provided services to youth services agencies had e-mail access and all but one had Internet access.

L.E.A.P. asked potential partners in the youth network to complete an application form that was used to determine the ability of the organization to participate in electronic communications. Based on the information provided, 10 organizations were invited to serve as charter partners to the National Youth Center Network: Alabama Council on Human Relations, Children's Defense Fund (Washington, D.C. and Marlboro County), Computer Clubhouse, Eagle Rock School and Professional Development Center, Korean Youth and Community Center, Lansing Housing Commission, L.E.A.P. and the LCLC, Plugged In, Southern Coalition for Educational Equity, and Urban Strategies Council.

On October 21-22, 1995, all the NYCN partners met. One purpose of the meeting was to develop a vision for NYCN and to determine how each partner would contribute to fulfilling it. It was decided that each partner would take on a project related to its area of expertise. Each project also addressed one or more of the goals of the TIIAP project. A second purpose was to ensure that all partners had common understanding regarding online communications, use of the Internet, and the integration of these tools into daily operations; this was accomplished through some training exercises. Following this meeting, L.E.A.P. staff visited each partner organization to help plan its NYCN project.

One project objective was to establish an annual youth center networking conference. The first of these conferences, "Risks and Opportunities for Children and Their Advocates on the Information Super Highway," took place on February 7, 1996, as a presession to the Children's Defense Fund's annual conference. The project also coordinated several technology workshops during the CDF conference and operated an Internet Demonstration Laboratory during both the presession and the regular conference.

The project developed a database of descriptive and contact information for over 200 youth organizations and resources. Entered on line during the fifth quarter of the project, staff then worked on keeping it updated. The project received a time extension to make the online database fully interactive.

Steps Taken to Sustain Project Activities Beyond the TIIAP Grant

The LCLC was highly integrated into the L.E.A.P. program in New Haven from the beginning, and it continues to be. L.E.A.P.'s revenue comes from a variety of federal and state sources, as well as private foundations and contributions from individuals.

The network (NYCN) piece of the project has not continued, because it is beyond the fiscal capacity of L.E.A.P. to maintain it. The Morino Institute has the money, but does not consider the network to be a strategic use of funds because of limited results (see Section G, Lessons Learned).

Activities/Milestones that Occurred Following the TIIAP Grant Period

L.E.A.P. has expanded services to Hartford, where they are community based. The two centers are located in units of low-income housing complexes. Both centers have computers and provide training in how to use them. One week after the site visit, an LCLC was due to open in New London in response to community requests.

Partnerships with schools have continued since completion of the grant. In 1996-97, teachers at the Helen Grant Elementary School received an orientation to the LCLC. In 1997-98, two classes at Roberto Clemente High School came to the center once each week. Both of these schools are in areas where L.E.A.P. runs programs.

Problems

Notification of TIIAP award occurred shortly before the project startup date. As a result, the project needed to adjust its timetable, in part because new staff needed to be hired. It took the project about 6 months to find and hire the network coordinator, who also became the project coordinator.

E. PROJECT ACCOMPLISHMENTS AND IMPACT

Technology-Related Accomplishments

The NYCN web site was established. However, as noted above, NYCN has not been continued.

Impact of Project on Direct End Users

L.E.A.P. children and their counselors make use of electronic communications on a regular ongoing basis. Staff commented that technology is also a viable tool for effective youth development. Technology is also a viable tool for youth employment training programs (e.g., the 16-year-old junior counselors are paid by the program.)

E-mail has become a primary communication mechanism. It is a way to keep in touch with high school counselors who go off to college and with summer counselors who go back to campuses in other parts of the state. The New Haven server now has 500 accounts, including staff, children, and school partners.

Impact of the Project on Other Beneficiaries and/or the Overall Community

Participation in the NYCN activities at the Children's Defense Fund Conference was as follows:

- Over 125 people attended the pre-conference;
- About 500 people used the technology demonstration laboratory;
- Over 250 people attended NYCN-sponsored workshops during the conference; and

• Over 125 visitors to the lab expressed an interest in learning more about and participating in NYCN.

Impact of the Project on Grant Recipients and Project Partners

As a result of TIIAP, the New Haven LCLC experienced great growth, from minimal use of computers to a center that uses the electronic media for educational purposes. From fall 1994 to summer 1996, the NYCN partner organizations generally went from minimal e-mail access to organization-wide access, from no web presence to web access, and from no online collaborative activities to the conduct of such activities.

Each of the partner organizations conducted a project that addressed one or more of the goals of the TIIAP project. For example, the project designed by Eagle Rock School in Estes Park, Colorado, is described as follows:

"Eagle Rock has a unique model and philosophy in its serving of high-school students not succeeding in the traditional educational and living environments. Their model and philosophy as well as implementation scheme are being developed for dissemination via the World Wide Web. Also, their students will engage in a discussion with curriculum and program developers of other NYCN partners in issues surrounding helping in the education of youth who have difficulty with traditional learning environments. As an additional cooperative venture with other NYCN partners, Eagle Rock will serve as a pit-stop for the children engaged in the L.E.A.P.-Plugged In cross-country Internet project. During this time, students from all three organizations will share and interact both using e-mail and the more engaging Internet-based video-teleconferencing."

Some relationships among the partners in the national network (NYCN) still exist. However, since the grant, there has not been ongoing growth.

Project Goals Not Met

All project objectives were fulfilled.

Impact of TIIAP Support on the Initiative

According to project staff, without the TIIAP money, L.E.A.P. would have gone ahead with developing electronic communications, but not as quickly. The TIIAP money expanded their commitment regarding technology, including central office staff. It upgraded their way of thinking.

Especially as a result of the CDF conference, L.E.A.P. became established nationally as a child development program. This has helped them get established with private funders.

F. EVALUATION AND DISSEMINATION

Evaluation

Evaluation of the TIIAP project consisted of 1) documenting that the timeline for project objectives was met; 2) compiling information about the partner organizations; and 3) conducting a brief survey of the partners to determine their e-mail accessibility, web presence, and conduct of online collaborative activities. Survey data for fall 1994 and summer 1996 for each partner organization are provided in the final report.

When the NYCN network director was hired, there were plans to conduct two focus groups to assess the uses of technology in low-income communities and the accessibility of technology to low income clients. However, these did not occur.

An external evaluation of the overall L.E.A.P. program was conducted in 1996, and the results were very positive. Unfortunately for our purposes, the technology component was not separately addressed. A full-time evaluator for L.E.A.P. was hired in June 1997.

Dissemination

The project activities related to the Children's Defense Fund conference could be considered dissemination activities. Results are shown under Section E.4.

Information about the project appears on the NYCN web site, which is still accessible.

G. LESSONS LEARNED

- The organizations participating in the National Youth Center Network were very different from each other. As a result, L.E.A.P. staff found that there was no easy way to keep them organized. They suggested that if the organizations had all been at the same level, it may have been better. The commitment of the organizations varied, as did the money they had available and their understandings of the project.
- Instruction in web searching should be provided by trained teachers or counselors, not by technical people.
- In order to run a successful 1-hour class, 2.5 to 3 hours of prep time is needed.
- Collaborative projects need to factor in time spent in planning and in debriefing. Because of the amount of time, it is difficult to put a volunteer or even a college student working part time in charge.
- Old computer models can't run many of the applications and are, therefore, not recommended.
- Backup activities are needed for when the equipment fails or a website can't be accessed because it is down or so many people are trying to use it.
- A project with only one platform is easier to administer.

- Community partners are important to have. They have been helpful in securing space and providing wiring.
- Learning goals need to be clear. Technology must be integrated into the lessons.
- The focus should be on people and on staff development, rather than on the technology.

H. FUTURE PLANS

- A second L.E.A.P. Computer Learning Center was expected to open in New Haven in June 1998.
- As the overall program expands, staff expect to have technology as a piece of what is provided.
- Staff are exploring ways to provide more access to more students and to parents. However, they want the experience to be of high quality.

Appendix

LCLC Activities

1. 12- to 14-year olds

The Heritage Calendar

Approximately fifty 12- to 14-year-olds (six groups) in the L.E.A.P. program will attend LCLC biweekly throughout the year. Every 2 weeks, they will receive 2 hours of instruction on the computers to aid them in their L.E.A.P. year-long project, the Heritage Calendar. Using Photoshop, a professional-quality graphics program, the children will enhance and manipulate images of African American and Latino heroes and sheroes. They will then access the World Wide Web to conduct research on their group's chosen s/hero. Each group will assume responsibility for designing and providing content for 2 months of the calendar. Together, all six groups will create a 12-month calendar representing their heritage through words, images, and history. They may then market their product on the Internet as well as through other media (e.g., local television and radio ads). The children will also contribute their research to Midlink Magazine's "People of Character" project (http://longwood.cs.ucf.edu/~MidLink/).

Software platforms for this curriculum:

Adobe Photoshop 3.0 (Mac/Win), Netscape 1.1 by Netscape Corporation (Mac/Web), Adobe Pagemaker 6.0 (Mac/Win).

Special Hardware: Scanner.

2. 7- to 11-year olds

Think GlobaLEAP

Twenty-five children between the ages of 7 and 11 will attend LCLC for 2 hours each week to engage in a project related to the year-long L.E.A.P. curriculum, "Around the World." LCLC will provide a forum to deepen and expand children's exploration of cultures across the globe. These projects will be similar to the Heritage Calendar project in that they will be fully integrated into the overall L.E.A.P. curriculum and will direct the children's activity towards a concrete goal. Rather than work towards a single, long-term product, however, 7- to 11-year-old LCLC groups will create smaller products along the way. Children will engage in short, collaborative Internet projects such as the Currency Comparison/Conversion Project, in which they will reinforce mathematical concepts as they learn about money from around the world (http://www.pegasus.oz.au/~gorokep12/curcomp1.html). Interactive reading software will allow children to become "global storytellers," adapting familiar stories to new cultures. In addition, every child will have a personal account on the L.E.A.P. mail server and will communicate via e-mail to key pals from around the world. Finally, given the fact that most of the children do not have access to computers outside LCLC, it is important that they be able to leave with a product in hand to show for their creative efforts. Therefore, children from the three groups will contribute drawings, photographs, interviews, op-ed articles, and special events info to a collaborative monthly magazine that can be published both on paper and online.

Software platforms for this curriculum:

Kid Works 2 by Davidson (Mac/Win),

Dabbler 1.0 by Fractal Design (Mac), Pine e-mail by University of Washington (freeware, Mac/Win), Netscape 1.1 by Netscape Corporation (Mac/Win), Student Writing Center by The Learning Company (Mac/Win), Fizz and Martina in Tough Krudd 1.11, and Jack and the Beanstalk 1.11 by Tom Snyder Productions.