DOCUMENT RESUME

ED 376 940 PS 022 690

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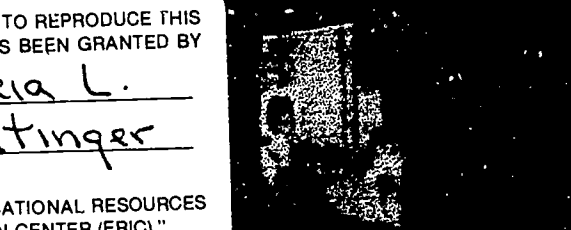
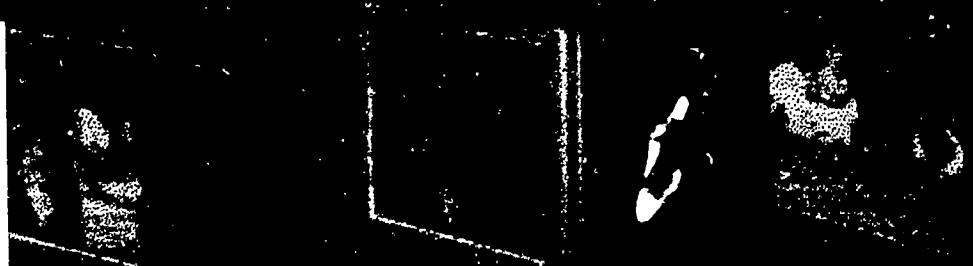
TITLE The Best of ACTTion News 1989-1992. 1st Edition.
INSTITUTION Western Illinois Univ., Macomb. Coll. of Education.
SPONS AGENCY Special Education Programs (ED/OSERS), Washington, DC.
PUB DATE Sep 92
CONTRACT HO24D90019
NOTE 66p.
PUB TYPE Collected Works - General (020)

EDRS PRICE MF01/PC03 Plus Postage.
DESCRIPTORS *Computer Assisted Instruction; Computers; *Computer Software; *Computer Software Reviews; *Computer Uses in Education; *Disabilities; Early Childhood Education; *Special Needs Students
IDENTIFIERS *Computer Integrated Instruction

ABSTRACT

This booklet presents a compilation of the best articles from the quarterly newsletter "ACTTion News," produced by Project ACTT: Activating Children Through Technology. It contains reviews of software programs and articles on computer technology, training, and curriculum publications. The articles are arranged alphabetically, and those that appeared in the newsletter as part of a series are printed together. The particular focus of these articles is on the benefits of computer technology for young children, especially those with disabilities. In addition to software evaluations and general articles on computer technology, the booklet gives ideas for creating software and making a personalized computer T-shirt; practical advice on making a Turtle Cursor and McGee Programs; and helpful hints on locating funding sources, assisting children at the computer, and preparing the computer environment. (AS)





The Best of ACTTion News
1989 - 1992

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September, 1992
(1st edition)

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The Best of ACTTion News is a product of a grant funded by the U.S. Department of Education, Office of Special Education and Rehabilitative's Early Education Program. Grantees are encouraged to express their judgement in professional and technical matters. Points of view do not necessarily represent official U.S. Department of Education position or policy.
HO24D90019

This product was developed under a grant with the Office of Special Education, U.S. Department of Education. Reference to commercial products, trade names, or manufacturers contained within this work is for purposes of example and illustration. Such references do not constitute endorsement by the U.S. Department of Education.

Introduction

Welcome to ***The Best of ACTTion News, 1989-1992***, a compilation of articles from *ACTTion News*, the quarterly newsletter produced by Project ACTT: Activating Children Through Technology.

Published four times a year, *ACTTion News* contains timely features on technology and training, reviews of software programs, and articles on curriculum publications. ***The Best of ACTTion News*** will provide you with just that--the top articles from years past, all in one publication. Articles are arranged alphabetically, and those which appeared in the newsletter as part of a series are printed together. We've included exciting up-to-the-minute information on the benefits of technology in the development of young children with disabilities, along with creative ideas, practical advice, helpful hints, and much more!

As always, we welcome your comments and invite your suggestions for future articles in *ACTTion News* or any other ideas you might have for our project.

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Ask ACTT

Dear ACTT,

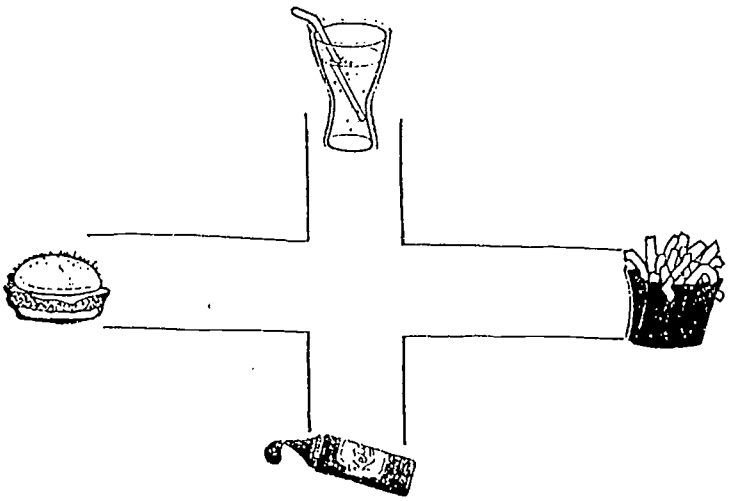
What is ACTT Instant Logo? How does it differ from Logo?

Logo is a computer language that can be used for graphics, computation, words and lists, music, or a sophisticated multi-purpose system. With Logo, the user teaches the computer by typing commands and storing them as procedures. Through these commands, such as FORWARD 50, RIGHT 90, FORWARD 50, etc., and procedures, the user moves Logo's cursor, referred to as a "turtle," on the screen leaving a trail, creating shapes, designs, and pictures.

The very nature of Logo makes it ideal for teaching and reinforcing children's problem solving and higher order thinking skills. However, young children have neither the spelling nor keyboarding skills to type in the Logo commands.

ACTT found a way, through ACTT **Instant Logo,** to allow preschool children with or without disabilities to make use of Logo and to benefit from the logical thinking and strategy skills needed to implement the program. With ACTT **Instant Logo,** children can draw pictures, direct the turtle to a target through a maze, or direct a robot (such as the Valiant Turtle) through an obstacle course.

Seven years ago, the Terrapin **Logo Utilities** II disk, which contains an Instant Logo, was adapted by ACTT to meet the needs of young learners. ACTT arranged the command keys for FORWARD, BACK, RIGHT, and LEFT in a diamond pattern on the keyboard, with FORWARD at the top, BACK at the bottom, and RIGHT and LEFT on their respective sides. Colored stickers attached to these keys make them easy for children to identify.



Using ACTT Instant Logo with a maze, a child can improve problem solving skills. Create a maze like the one above from an overhead transparency. Attach stickers to it and ask the child to follow the maze to get a lunch. Mazes can become more difficult as the child progresses. The variety of stickers available makes it easy for you to be creative.

For children with disabilities that do not allow them to access the keyboard, ACTT has also written "One Touch" procedures for using ACTT Instant Logo with the KoalaPad™. When one side of the Pad is pressed, the turtle moves forward; the other side operates as the BACK command. The buttons turn the turtle right or left. For those who need other alternative input devices such as switches, expanded keyboards, or larger touch tablets, Logo can be set up to be used with an Adaptive Firmware Card. The AFC also allows for speech feedback. Thus, when the child presses the area to move the turtle forward, the word "forward" is heard.

ACTT Instant Logo is a set of procedures for use with **Logo Plus, Krell or Terrapin Logo.** You *must have one of these programs before you can use ACTT Instant Logo procedures.* If you do not already have one of the programs, we recommend **Logo Plus.** Be aware, however, that it requires 128K of memory, while the others require only 64K.

You **cannot buy ACTT Instant Logo** on a disk from us. However, the philosophy and procedures for using **ACTT Instant Logo** are available in **Building ACTTive Futures: ACTT's Curriculum Guide for Young Children and Technology, Section V: Amazing Logo.** This Logo section contains all procedures necessary for you to enter **ACTT Instant Logo and One Touch Instant Logo** procedures onto a disk, as well as numerous Logo computer and computer-related activities that can be used with young children with disabilities. The Logo section may be purchased separately from the rest of the curriculum package. See the products section at the end of this newsletter for more information.

Also, for an overview of the benefits and operation of Logo for young children, our Project has a videotape and manual, **Logo in the Preschool Curriculum,** available for $49.95.

the bottom line...
Money, Money, Money

This article was based on the session "Augmentative Communication" presented by Aimee Luebben at the ACTT I Conference, March 16,1990.

There are three traditional sources for funding adaptive devices for children with disabilities. The first is private insurance companies. The second is public insura agencies (public aid, for example). The third option is the Division of Services for Crippled Children.

Letter of Justification

When approaching any of these three agencies for funds there are some general guidelines to follow. First, write cautiously. Your letter of justification for your request should be no more than one page, so be concise. Second, watch your terminology. Most agencies are comfortable with terms like "communication prosthesis" but some private agencies are not. Check this out with the agency before you submit your letter of request.

Third, be specific. Describe what the person's capabilities are, what his needs are, and what he will be able to do with the equipment you are recommending. Justify every piece of equipment.

Quote the child's physical or occupational therapist. She can help you write powerful, accurate statements like, "the wheelchair Michael is now using is contributing to the creation of physical deformities which will require corrective surgery".

After you have exhausted the traditional means of funding, it's time to try a creative approach.

Aimee's Three B's of Funding

Don't overlook your local resources. Luebben offers three alternate methods for finding funding sources. They are:

1) Beg
2) Barter
3) Blackmail

These options vary from individual to individual as to their effectiveness. They are to remind you of local resources available to you. Maintain a list of presidents of service clubs in your area. Kiwanis and Lions clubs do a great deal of philanthropic work in local communities. Develop a slide program, or include a child in a presentation at one of their meetings to demonstrate what a child with disabilities **can do** with appropriate equipment. Keep your presentation positive.

Check with the hospital. Most hospitals have social workers who can help you.

It is also advisable to talk to trust officers at local banks. Find out if there is money available from annuities which could be used for equipment for your children.

Check with libraries in your area. Some libraries now offer a service which will allow you to examine records that state the amount of money contributed each year and the area it was given to benefit.

The secret of successful funding is to keep trying. The money is out there. Your job is simply to redistribute it. That may require donation cans with your child's picture on it at grocery stores. Benefit dances and auctions are another possibility. Or consider renting the equipment instead of purchasing it. Quite often you might need to use a combination of methods, a wheelchair from one source, a computer and software from a service organization, and a speech synthesizer from another. The secret to successful fundraising is creativity, flexibility, and persistence.

Spring 1990

A Boy Named Ben

by Carol Schneider

Here at Macomb Projects, Project ACTT's "sister technology project" is Project TTAP. Our Technology Team Assessment Process is a demonstration project designed to develop, implement and demonstrate a cost effective functional technology assessment model. TTAP provides computer assessments here on the Western Illinois University campus at no charge to parents of children with disabilities.

During an assessment, the TTAP team, consisting of a Child Development Computer Specialist from the TTAP staff, a Psychologist, an Occupational or Physical Therapist, the child's parents, teachers and/or other support personnel, combine their efforts to assess a child's ability to use the computer to attain developmental goals.

When the assessment is complete, Project staff then recommend appropriate equipment and help parents, therapists, and teachers design strategies for the child's individual education plan. Any child, birth to 8 years of age, who has a disability which prevents him from interacting with nis environment and learning in traditional ways, qualifies for a TTAP assessment.

One child assessed by the TTAP team was Ben. His disabilities resulted when he suffered several strokes from complications of heart surgery performed in the spring of 1989. Ben had been in a coma for several weeks after surgery. The heart surgery itself was successful, but complications following surgery left Ben with a tracheotomy, gastronomy and complete dependence on family and medical personnel to meet his needs. Ben had lost his physical abilities to do much of anything. His communication skills consisted of blinking his eyes for "yes" and moving his eyes side to side for "no". Prior to the stroke, Ben, an active 8 year old, had no physical disabilities.

Ben's mother heard about TTAP and inquired about an assessment for her son. The assessment was scheduled for October 1989.

The TTAP team evaluated Ben from his wheelchair and a right side-lying position. An unsuccessful attempt was made to place the computer on a table so Ben could try to approach the keyboard or switch from his wheelchair/tray. A more successful attempt was made when Ben was placed in the side-lying position. The monitor was placed on the floor for Ben to view while he tried to activate a switch with his knee. Ben had considerable difficulty making and maintaining contact with all switches for any length of time. His face indicated he wanted to activate the switch, but his body would not allow him to do it.

During switch training at home Ben lies on the floor and activates a switch with his wrist.

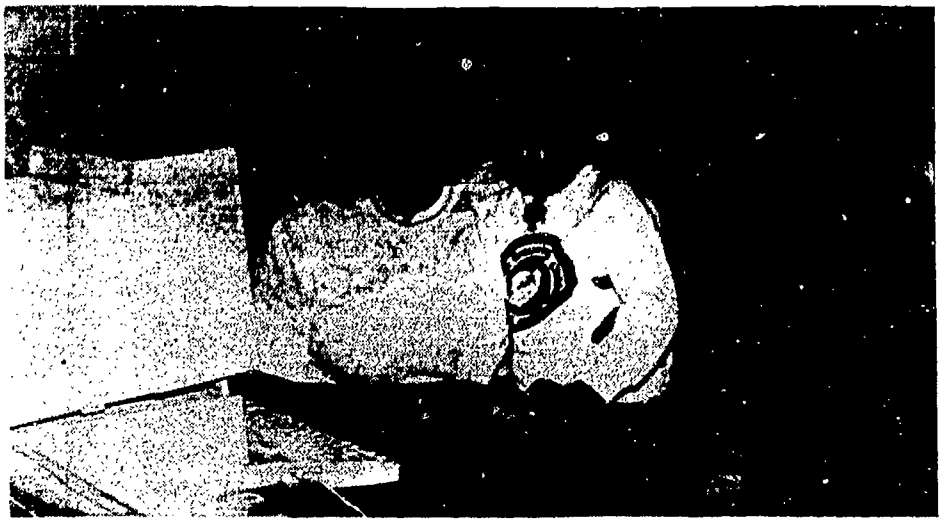
As a result of the assessment the TTAP team recommended initial switch training to give him a sense of control over his environment. Through home activities and therapy sessions, Ben became accustomed to using the switch. Once he grew comfortable with it, further activities with simple switch software and a computer were used to help Ben with various developmental goals. The ACTT and TTAP staff provided training to the family and any of Ben's support team members on computer equipment, software use, resources, and switch construction.

By March 1990, Ben's progress was heartening. He was now blinking his eyes and shaking his head for a" yes" and " no" response. He could raise his right arm for yes, pull himself to a stand, drag his left leg, walk with assistance, stand with minimal support for 20 seconds, and voluntarily bend his knee. Ben's verbal communication was , "Hi", "I", and "I love you".

TTAP's computer assessment indicated that a computer system would help Ben, since technology can be a tool for schoolwork as well as entertainment. An Adaptive Firmware Card™, a device which allows the user to bypass the keyboard

and use a switch with most software programs, was recommended for Ben to allow him to use the computer in a more versatile way.

Ben's parents contacted Dream Factory, a nationwide, nonprofit organization with 28 chapters in the United States and abroad, to request computer equipment. (Volunteers of this organization are dedicated to fulfilling the dreams and wishes of seriously ill children.) The Adaptive Firmware Card™ was purchased from a $500.00 grant from Dick Blick; a new computer table was purchased for Ben through a local class project, and basic awareness computer training was conducted by Project ACTT. The TTAP assessment report was instrumental in assisting Ben's parents in obtaining Ben's Apple IIGS computer system from Dream Factory and Dick Blick.



Seated on his mother's lap, Ben shows Carol Schneider how he has learned to communicate with a switch and a IIGS computer.

Ben's mother received Adaptive Firmware Card™ training in May, 1990 from the ACTT staff. At the end of the training session, a scanning array was selected for the The Print Shop (Broderbund). Ben had been listening to the training session the whole time while lying on the floor and indicated he wanted to be placed upon his mother's lap. As he was sitting on his mother's lap Ben communicated through his body actions that he wanted to activate the switch. With assistance from his mother, Ben attended to the monitor, watching the scanning array to activate the switch to spell his full name.

When TTAP made a follow-up call in December, 1990, Ben's mother reported that Ben could now independently sit up by himself, get up to crawl, stand for a long period of time, focus on objects better, turn around, and find her lap to crawl onto. He now attends school from 9:00 - 2:00 each day.

Ben uses the computer each day while at home. A software program, **Audio Scan** (Don Johnston), is used daily for basic communication skills. Ben assisted his speech therapist in setting up this skeleton program.

Project TTAP staff are proud of young Ben's accomplishments and of the role their assessment played in helping Ben and his family members obtain the equipment he needed. His family and support personnel recognize the benefits computer technology has for Ben.

Perhaps you know a child who would benefit from Project TTAP assessment. For more information, call the Macomb Projects' office — 309/298-1634.

Winter 1991

Children and Art: Why Bother?

by Patricia Hutinger

One of our most popular conference presentation topics in recent months has been "Why Should Young Children Spend Time Drawing and Painting? Aren't There More Important Things To Do?" We have been surprised—and pleased—by the popularity of the topic. We realize art's importance for young children and are happy to know others agree with us and are concerned about implementing art activities with children who have disabilities.

The impact of the expressive arts on the developing young child with disabilities has not enjoyed widespread attention, although the importance of play in the early childhood curriculum has gained increasing attention and acceptance in the past ten years. However, the arts, which are an important part of regular early childhood education curriculum, also offer important benefits for young children with disabilities. Both art and play have important and critical roles in children's growth as symbol makers (Dyson, 1990). During the early childhood years children become fluent and inventive users of symbols, including gestures, **pictures, drawings,** spoken words and written ones (Vygotsky, 1978; Gardner, 1982, Nelson, 1985). The arts are rich in sensory experiences, involving interactive processes that foster a variety of learning (Brittain, 1979; Smilansky, 1968; Heathcote, 1984; Smith, 1984; Wagner, 1988).

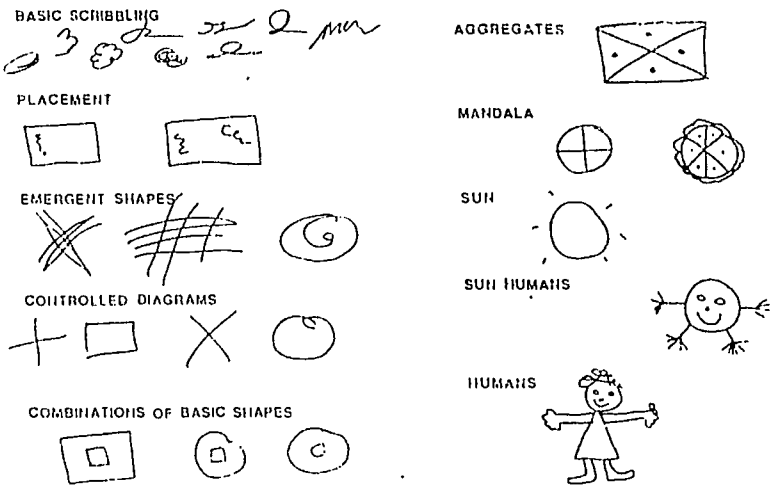
Arts for children without disabilities focus on the processes and outcomes of child-directed activities, exploration of a variety of materials, and the expectancy that children progress through a regular sequence of images from scribbles to recognizable objects and people (Kellogg, 1970; Lowenfeld & Brittain, 1975). While Kellogg (1970) believed that all children pass through the same progression of making symbols, she suggested that the exceptions are children with severe physical and mental disabilities. We would argue that perhaps those children have not had enough opportunities to participate in child-directed drawing and painting because of the nature of their disability.

The current trends toward using technology applications, i.e., computers, graphics (drawing) software, and adaptive peripherals, such as touch tablets or switches that can be activated by the head, knee, foot, or hand, make it possible for children with severe disabilities to draw with color and to print out a hard copy of their drawings using a color printer. Furthermore, a trend toward greater child initiation of activities seems to be emerging (Bricker, 1988).

Children with disabilities are afforded little time to explore materials and participate in child-initiated expressive arts activities for many reasons, sometimes because there are "more important things to do." While art activities have a place in curriculum activities for children with disabilities, the arts are likely to be viewed as vehicles to meet a specific therapeutic objective (i.e., finger painting for children who are tactily defensive) and tend to be adult-directed (i.e., teaching children to draw diamonds with 'proper' corners or recognizable trees using an adult image or coloring in a coloring book image drawn by an adult). Regular early childhood educators view the arts as a positive contribution, emphasizing child initiation, exploration of materials, and providing time for the child to develop his or her own visual art symbols. Special education staff sometimes use art in preschool programs but underestimate the potential benefits to be gained when young children engage in arts activities.

Just what are the benefits of expressive arts for young children? Drawings and three dimensional objects as well as dramatic play represent children's communication efforts before they are able to use the complex abstract systems of writing and reading (Dyson, 1986; Dyson, 1990). Art activities contribute to children's language development. They communicate ideas and feelings through drawings, and the art processes and products serve as topics of conversation with their peers or adults.

Summary of Developmental Images Denoting Stages of Children's Art



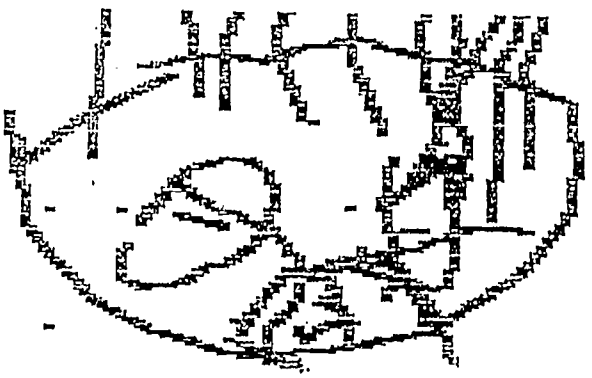
Adapted from Kellogg, R. (1970). *Analyzing children's art.* Palo Alto, CA: National Press Books.

Art activities make an impact on children's abilities to deal with abstractions. We no longer view early symbols, such as jagged lines to represent steps, as evidence of children's immature understanding of the world. Rather, they are viewed as evidence of children's creative capacity for discerning links between a symbolic medium (like crayon strokes) and an object (like actual steps) or some feeling. This ability supports young children's acquisition of the basic symbolic tools of their culture (Dyson, 1990).

Research has also linked drawing to emerging literacy in young children. Dyson (1986) suggested that through drawing young children learn about composing and using symbols which would be valuable to them when learning both written and spoken language. She concluded that drawing may function as a transition to writing.

Unfortunately, because the majority of twentieth century Americans see little reason for art, expressive arts in education are often the first thing to be cut in a budget crisis or time crunch, although the expressive arts hold the potential to be both the vehicle for and content of serious learning for young children as well as older ones. Perhaps this is because most adults see the arts as esoteric activities and nothing more than pastimes or hobbies. As Greene laments, "What happened to imagination? It has been discouraged by literalism, by complacency, by technical rationality, by obsessions with predictable results . . . [we need] to break through the fixities of our age . . . to look at things as they could truly be otherwise" (1988, p. 55). An already overburdened curriculum has insufficient time for frills such as the arts, some argue. Further, they believe that only a small percentage of children have exceptional artistic talent, so education in the arts is more expendable than education in other areas of development (Jalongo, 1990). Public school personnel often hold the misconception that parents will not support programs that emphasize the expressive arts together with the myth that only specially trained teachers can take responsibility for the expressive arts (Jalongo, 1990).

Since the arts are part of early childhood curriculum for children without disabilities, then the arts, with appropriate adaptations, should be a part of the curriculum for children with a *wide range of disabilities*.



Computer self-portrait done by a 4 and a half year old child using the TouchWindow®.

We believe that omitting or downplaying the arts in early intervention programs IS a disservice to young children with disabilities and their families. With adaptations, children with moderate to severe disabilities are able to participate in and benefit from the activities that engage their less disabled peers. Both high tech adaptations such as computers, peripherals, and software, as well as low tech adaptations such as larger and/or longer brushhandles and crayons that can be held in the palm of the hand can be used to integrate the arts into the curriculum for children who have disabilities and to give these children opportunities for learning and communicating through creative expression.

Spring 1991

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Computers: Powerful Communication Tools For Children

by Patricia Hutinger

The following material is adapted from Dr. Hutinger's 1989 LEEP Conference presentation, ***Technology: Impact on Communicative Competence.***

What makes the technology success of children with disabilities possible? Understanding the underpinnings requires examining several factors. Society's insatiable demand for the acquisition, storage, and speedy retrieval of massive amounts of information together with more powerful, sophisticated technology and instantaneous transmission of information across continents seems a far cry from preschool classrooms and the pressures inherent in implementing Public Law 99-457, the Education of the Handicapped Act Amendments, with its emphasis on early intervention. Yet, only a few years after the development and miniaturization of the microprocessor, computers had made their way into a few experimental early childhood programs for children with disabilities. Our own Project ACTT, initially funded in 1983 as a Handicapped Children's Early Education Program (HCEEP) model demonstration project, continues to train personnel, develop additional technology applications, and replicate the ACTT model. Prior to ACTT, the Macomb Projects staff spent two years training special educators to use computers in both inservice and university coursework. Over the past seven years, the array of computer hardware, software, and peripherals increased as new products appear on the market at an astonishing rate. Today's applications will soon seem outdated and primitive, but that is the nature of the technology explosion and does not constitute a reason for educators to "sit back and wait to see what will happen."

Computers and companion equipment have catapulted us into the Information Age, creating a society trying to cope with a technological revolution. Many adults are unwilling or even afraid to face the changes that technology brings to the world, yet these same adults may be classroom teachers whose "maybe it will go away" attitudes deny their students the advantages technology offers.

Even so, those who question the value of technology in the schools readily accept its uses outside of education. A wide range of technology applications is available outside the schools from the now commonplace microwave ovens and video cameras to robot controlled assembly lines and computerized audio warning systems in cars. Technologies are combined and information accessed in ways that our grandparents would find unbelievable—electronic data bases or computer driven media shows (think about those rides and displays at Epcot Center).

At issue in the Information Age is the fast transfer of clear, concise information. Those who have information have power, an important reason to provide communication tools for children with disabilities at an early age so they grow up with a sense of competence, knowing they can communicate their ideas and needs and interact with their world. Using the tools of technology to communicate results in many disabled children gaining skills and opportunities to equalize the way they function in normalized settings.

While the 80's saw the addition of P.L. 99-457 with its emphasis on special programs for very young children, the decade of the 90's began with the federal government funding states to implement the Technology Related Assistance Act for Individuals with Disabilities (Public Law 100407), landmark legislation which socially validated the positive impact of technology upon individuals with disabilities, including very young children. The challenge of the 90's is to integrate elements of the two pieces of legislation, P.L. 99-457 and P.L. 100-407, so that greater numbers of young children with disabilities have the benefits of technology access. Educators must continue to demonstrate and verify benefits already observed in well-documented research studies and program evaluation findings. At the same time, they must develop more applications for children based on the advent of new technology. Planning and implementing a state-of-the-art computer curriculum in early childhood programs require time and resource-intensive efforts.

While legislation emphasizes early intervention for children at risk or those with disabilities, society emphasizes the functional aspect of 'getting the message across.' Increasing emphasis on communication is demanded across society, in video, telecommunications, and information management. Developing functional language skills is the prelude to communication and is a major element of early childhood curricula today, as in the past. As language theorists and educators increasingly discussed the importance of syntax, semantics, and pragmatics in the developing communication skills of young children, the seemingly unrelated advent of the computer provided a new curricular element that serves as a tool and a topic

for communication as well as a tool to analyze research data.

Computers represent only one component of the Information Age, but they are not a passing fad; therefore, incorporating their assets into early childhood curriculum is imperative. Computers are part of the real world. No longer seen as frills, computers are available to many children in their homes or private nursery schools. However, some teachers and administrators still need to be convinced that technology has a place in the preschool or early intervention classroom. Misconceptions about using computers abound, including the notion that, as one teacher said to us, "These children are so far behind, they need the basics. They don't need computers." But time after time, we see children who do not usually respond to adults or to other children talking to everyone about their computer experiences. For them, computers become an exciting reason to communicate, a topic of immediacy and interest.

A positive effect of this computer experience is that parents enthusiastically approve of involvement in technology and often take part in more than planning their children's programs. Sullivan and Lewis (1988) pointed out that one of the major effects of their computer contingency intervention program was on the positive perceptions and attitudes of parents to their disabled children. Not willing to wait until research data are available, parents tell us they do not want their children to miss out on opportunities other children have. Neither do they want their children to be behind others. Lois-ellin Datta (1986) notes a similar response in her analysis of public and private policies that partially determine whether or not computers will be available to some or all children. Some parents we know have developed interesting individualized software programs for their children while others volunteer in the classroom, helping with computer activities.

The challenges of designing exciting computer activities for children, in conjunction with training early childhood staff to use technology applications themselves and with children, present major tasks for the 90's. Nevertheless, both are likely to be less formidable as hardware and software become more "user friendly" and as costs decrease. However, new equipment is not likely to make its way into classrooms for some time because of expense, existing and still usable older equipment, and reluctance among professionals to use technology with young children because of lack of knowledge, fear of technology, or the genuine, if inaccurate, belief that technology is not appropriate for youngsters. A bewildering array of hardware, peripherals (printers, switches, joysticks, paddles, graphics tablets, adaptive keyboards, and TouchWindows®) and software needed for young children to operate computers is available in the marketplace, adding to early childhood personnel's confusion and reluctance about equipment and applications. Yet the challenges of technology are well worth the effort. Providing young children with the tools of technology to communicate is a potent means of empowering them so they can function more fully in their homes, classrooms, and communities.

Summer 1990

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Computers: Language & Communication

by Patricia Hutinger

The following material is adapted from Dr. Hutinger's 1989 LEEP Conference presentation, ***Technology: Impact on Communicative Competence.***

The pragmatic assumption that communication has a consequence guides ACTT's work. Typical youngsters learn to communicate without a classroom teacher, learning language "naturally," through exploration, imitation and practice. Communication is not an isolated phenomenon; rather it is a part of the tapestry of a child's experiences with the people, objects and places in her world.

Learning new vocabulary means interacting with new objects, going to new places, and studying familiar objects in depth. Without potent, meaningful experiences, new words are soon forgotten. Sitting in a circle while the teacher talks (unless the goal is to attain listening skills) provides an opportunity to sit in a circle, but seldom results in the child attaining major language goals she retains and uses over a long period. Moreover, the child needs to make decisions about what to communicate so that she is in control of her own communication. The intent to communicate, together with a purpose for communication, is essential.

If adults expect communication, then children need something to talk about (interesting software programs such as **McGee** or **Katie's Farm**); a way to communicate (**Peek & Speak** with a PowerPad™ and the Echo™); and a need or reason to communicate (giving directions to another child who is operating the computer to move a robot around the room). Using computers provides for all three. Children communicate for a variety of purposes: to alter someone's behavior ("Move 'im back!" "Press that key instead."); to alter some aspect of their environment ("Stop him!" "Make it beep!"); to transfer information (using a screen dump to print out the monitor picture); and to produce information.

Inability to communicate their needs is frustrating to young children and, we believe, is a major factor in "learned helplessness." Several children with cerebral palsy in our caseload were 12 or older when we first introduced them to specialized computer communication systems. For the most part, those children tended to be more motivated to maintain comfort and the approval of their caregivers than in participating in communication events and cooperative games with other children. Our findings point to the need to provide a tool as early as possible to produce oral speech for children who cannot talk, thus increasing their sense of competence and reducing their frustration levels and "learned helplessness".

Computers stimulate language because they incorporate a unique combination of graphics, animation, speech output and sounds (Meyers, 1986; O'Connor & Schery, 1986; Larson & Steiner, 1985). Moreover, they represent a set of novel stimuli and a "real life" activity, a machine that adults also use, not a scaled down toy replica of adult objects. Furthermore, computers are responsive and patient, unaffected by the psychological stresses of everyday life. For the most part, the child is in control with only a little help now and then from adults. Four- and five-year-olds, and often three-year-olds, can start a system and boot a disk. Such independent behavior occurs time and time again. In the beginning, we were not sure that young children really could take responsibility for computer use, but experience soon showed us that children easily learned the steps necessary to use computers competently and safely.

Computer graphics programs provide another means for children to explore symbols as they draw. For some children whose disabilities do not allow them creative expression with "standard" art tools, the computer coupled with a touch tablet and graphics software provide an additional outlet for creativity.

Communication Symbols

The function of language is communication, that elaborate and complex symbolic behavior essential to human survival in social groups. No matter what their culture, most people communicate with oral language, written language, and gestures — all symbolic behavior. Communication also includes music, drawing, painting, and sculpture. Early childhood

seems to be a time of accomplishments in the development of symbolization (Gardner, 1983; Gardner & Wolf, 1979; Hutinger, 1987; Sheingold, 1986). Seldom does the symbol (i.e., the word 'doll') bear any resemblance to the object itself (the curly-haired rubber doll as big as a toddler) unless the symbol system is drawing, painting or sculpture.

ACTT's emphasis on communicating with computers is based on the symbolic character of language and developmental levels of representation ranging from concrete objects to abstractions such as letters and words. Developing symbolic representation includes acknowledging and acting on the object itself (a toy fire engine), pictures of the object (a drawing of the fire engine), models of the object (a cardboard model), parts of the object (the hose and ladders), or sounds made by the object (the wail of the siren). Children younger than two who are at the very early stages of developing the complex notion that an object, a person, or an act is represented by a thought or an image, need to remain fairly close to representations of the real object. Photographs, whether moving or still, and drawings are more meaningful than letters or numerals which have little meaning attached to them.

Computer-operated robots generate much excitement and communication in the classroom. Children cooperate, discuss, and learn problem-solving strategies as they command the robot's movements together.

Children develop their own means of representing their world when they draw, beginning with scribbles that reflect greater interest in the process of moving a crayon or pencil around on a surface than in producing recognizable objects. Next, children name their scribbles. Only later do young children draw identifiable symbols (the sun, houses, trees, and their own special style of 'writing' that may or may not conform to adult expectations of what written symbols look like). We incorporated the graphic element of computer use into the **ACTT Curriculum** as one way to build on the developing symbolic skills of young children. Then, thinking that this point of view is so often overlooked and so important, we went on to produce **Exploring Graphics**, a videotape module on young children and graphics (Hutinger, Ward & Gomez, 1989).

Communicative Competence

Child or adult, people demonstrate communicative competence by manipulating symbols, not real objects, clearly so others understand. When we became interested in computer effects on young children's communication, we first observed a number of children using different applications, from a simple program to select food choices

(**Choices** or **Peek & Speak**) to small groups of children discussing what was going to happen in an adventure program (**Dragon's Keep**). Then, we listed general communicative outcomes we expected to see when children with all ranges of disabilities from mild to severe used computers. Generally these outcomes are characterized by whether or not they are appropriate and relevant, thereby demonstrating the child's competence.

Communication involves much more than simply learning vocabulary. Children need to make decisions about what to communicate. Talking about what they ate for breakfast won't solve the problem of helping another child move a robot along a map of the route to the grocery store the class has painted on brown paper. Children need to have an intent to communicate and, usually, the intent is related to their desire to influence a person or object in the environment. Perhaps that intent is to ask for a drink of juice or for help reaching a favorite toy or to tell someone the rules of a game or what direction to turn the robot.

Even more important, children need to know that they are in control of their own communication events. This means the child needs to have a way to initiate conversation about a new toy or a trip to the bakery or to indicate that she doesn't want you to tickle her anymore. However, whether through ignorance, sympathy, or frustration, all too often adults attempt to control the communication efforts of children with disabilities. Sometimes adults talk louder to a young child, as if volume will increase understanding. Or perhaps, impatient with the child's efforts, they do not allow her to complete sentences or words but finish them for her, thinking they are helping.

When children have an intent, a purpose to communicate, then a teacher's praise for "good talking" is unnecessary because positive reinforcement results from obtaining successful consequences for a communication effort. For example, when four-year-old Janet says she wants to play with the purse that is part of the toys used in the PEAL software **Exploratory Play**, giving her the purse to explore produces easily apparent, personal, and highly meaningful consequences for her. Perhaps she thinks, "If this works so well, I'll try it again!" Then, she does!

We have found the computer to be a powerful tool for young children's communication efforts. Computers offer the means to help those with disabilities communicate through artificial speech. Various software programs give youngsters communication opportunities with an adult or other children, provide stimulus for group problem-solving, or simply present children with new ideas and insights. In the next issue we will consider the computer both as a tool and as a topic for communication.

Fall 1990

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Computers: Tools & Topics for Communication

by Patricia Hutinger

The following material is adapted from Dr. Hutinger's 1989 LEEP Conference presentation, ***Technology: Impact on Communicative Competence.***

Computers as Tools for Communication

The unique capabilities of computers enable them to function in one mode as communication tools. Voice synthesis in combination with a computer and appropriate software provides a severely disabled youngster a means of communicating as well as a tool for practicing skills and engaging in games and other learning activities. Voice synthesizers speak for those without oral language, usually with an alternative mode of input such as one or more switches. Dedicated communication devices are continually upgraded by advances in computer technology. However, for children under two (and sometimes older), the complications and expense of dedicated devices are sometimes impractical.

Initially, very young children with disabilities which inhibit verbal speech need to understand that their action, whether it activates a head switch or a leaf switch, is a causal factor. When a child finds out that he makes something happen when he swipes the switch with his hand, he repeats the action. When that happens, the child is ready for simple communication software activated by a single switch or a PowerPad™. As the child grows more sophisticated in her communication skill, more complex software can be used.

Computer access to graphics programs, word processors, and printers takes the place of paper and pencils that cannot be grasped by children with severe disabilities. For example, in 1982 we saw a severely disabled fifth-grader in Sarasota, Florida, who was using a word processor because he could not write with a pencil. Interestingly enough, he thought his teacher was not paying enough attention to his writing on the computer monitor so he asked for a printer to record his writing. After he got his printer, he could communicate with the printed word so a listener was not an immediate necessity. His ideas and needs were saved with 'hard copy' so they did not get lost each time the monitor was turned off.

Although a computer often must be turned on by someone else, it provides a way to begin electronic communication activities with children whose disabilities prevent them from speaking. We first started working with Bryan, a child with cerebral palsy, when he was four. Although he was able to communicate verbally, he was unable to use his hands to write with a pencil. Computer graphics and word processing not only provided him with alternative means of communication but also gave him a skill to share with other children. In one video segment taken in 1989, eleven year old Bryan sits in his wheelchair talking with an ACTT staff member. He tells her, "On Fridays I go down and help the kids in the handicapped room learn to use computers."

"What are you drawing?" "How did you get that color?" Computer graphics programs spark interest and promote conversation between classmates.

Computers as Topics for Communication

Many children are placed in preschool rooms for developmentally delayed and handicapped children because their language is delayed or seemingly non-existent. Computers and software programs provide exciting adventures for children with oral or gestural language. **McGee** and **Katie's Farm** (Lawrence Productions) are two of the ACTT staff's favorite programs for young children. Designed with the preschool child in mind, **McGee** and **Katie's Farm** require no reading, have superb graphics and a realistic child's voice. Choices are made using the mouse and easy-to-select icons. In **McGee**, McGee is the first person to wake up one morning and has the entire house to explore while Mom is still in bed. In **Katie's Farm,** McGee and cousin Katie explore the barn, trees, fields, and ponds around the

farm. In both programs the antics, adventures, and infectious giggles of the characters provide a myriad of communication opportunities for children using the programs. A little girl in Springfield who does not talk much, made telling comments the whole time she used the **McGee** program. "What's he doin' outside by himself? He shouldn't oughta be out there alone! He'd better go inside where his mom is."

Computer activities are seldom as rich and meaningful in isolation as they are when accompanied by related off-computer experiences. Conversation about a software program, creative dramatics and group stories relating to the software program, and assisting others on the computer are only a few of the many computer-related opportunities which encourage language development. These related experiences reinforce a concept introduced by a particular piece of software and provide communication opportunities for the children.

Often the related computer activities lead to spontaneous play. Jean Davenport, Bryan's preschool teacher, usually has a Computer Week at the beginning of the year to acquaint or re-acquaint children with the hardware and software. During that time, activities include reading stories and singing songs about robots and computers, drawing and painting, writing group stories, making banners and signs, and engaging in dramatic play, all focusing on technology. Pictures and stories about computers line the hallway bulletin board. Jean and her children make a model computer with an egg carton keyboard, a cardboard box monitor, small boxes for disk drives, squares of lightweight cardboard for floppy disks, and construction paper sleeves to hold the disks. They record voice synthesized speech on a tape recorder, then set up a computer center.

A videotape segment of Bryan, when he was five, shows him sitting at the cardboard computer. After spending several minutes getting the disk inserted into the pretend disk drive, he 'turns on the computer.' At the same time, Jean turns on the tape recorder and we hear, "Hello. What is your name?" He says, smiling, "Bryan." The tape goes on to ask where Bryan lives, several other questions, and ends with "Do you like computers?" Bryan nods his head in affirmation, still smiling, then says, "yes." Other video segments show small groups of children playing at the computer center with Jean or with another child running the tape recorder. Conversation and attention focus on computer parts and operating procedures, helping children learn appropriate computer behavior.

Computer graphic programs such as **Master Touch, Touch Graphics** or **Micro Illustrator** stimulate conversation about the drawing process and about what is seen on the screen. Children first experiment with the drawing process, accidentally adding color or new ways to make lines. Much conversation is generated. "Look, now it's doing a circle!" "How do I get red?" "Will this one make a fat line?" As children learn the operations, they begin to make images and predict what kind of line they will draw or what they will make. The drawings can be saved or printed out in a hard-copy in black and white or in color if an ImageWriter II and a color ribbon are available. Stories about the drawings can be dictated. Dena McDonald, another ACCT classroom teacher, prints out drawings, writes the children's dictated stories about their drawings, photocopies the pages, and binds the story-drawings into a book for the children to take home. Dena involves the children in all aspects of the bookmaking, teaching them about the equipment and generating a great deal of conversation.

The **Explore-A-Story** series of software provide interesting content and are so inviting that children are quickly involved in story making activities. Themes relate to children's interests or real life experience, including **Where Did My Toothbrush Go?, A Brand New View,** and **What Makes a Dinosaur Sore?.** Related off-computer activities extend learning. For example, the dinosaur software includes a book about the prehistoric denizens, and teacher creativity with models, sandbox landscapes, and a dinosaur costume for a **Valiant Turtle** robot are not only fun but provide potent stimuli for conversation.

Using LOGO results in a great deal of discussion between and among children. Moving the LOGO turtle through a maze to get a hamburger at MacDonald's or to get to school works well if two children work together. They talk about which direction to turn the turtle, how far to move it to stay on the road, which end is the front and which is the back, and much more. A great deal of learning occurs when more than one child uses LOGO to operate a robot. Usually children do not need to be told to cooperate when they are intent on moving a robot around a floor map of their school room or toward a tower of blocks expressly made to knock down. Giving accurate directions presents an impelling need to communicate. Following directions is equally important if the blocks are to be knocked down. Asking questions is critical if the child happens to be operating the computer that controls the robot. Temper tantrums do not work. Refusing to say anything does not work either. Children find they need to help each other solve the immediate problem. To do that, they must communicate. Besides learning related cognitive tasks, children must confer with each other to attain a common goal. After all, who wants the robot to go off the road and get in the mud or miss the blocks all together?

Providing very young children with the tools of technology to communicate is a potent means of empowering them

so they can function more fully in their homes, their classrooms, and their community. Viewing computers as both tools and topics for communication provides families, teachers and administrators with a basis for planning goals for children and themselves. When such a useful tool is available, early childhood program staff must make use of it for the benefit of young children, their families, and society.

Winter 1991

Contingency Intervention: Teaching Infants with Severe Disabilities to Interact with Their Environments

by Joyce Johanson, based on comments by Mary Howell

At the ACTT I Conference, Mary Howell's presentation, ***Contingency Intervention: Using the Computer to Document Learning in Severely and Profoundly Retarded Infants,*** *included a demonstration of a contingency session, illustrative data of differential learning patterns in children, and videotapes of infants during contingency intervention sessions.*

Miss Howell, doctoral candidate in Special Education at the University of Illinois, Chicago, specializes in Early Intervention. Her interest in children with handicaps began during her career as a social worker. She is currently an early interventionist at the Institute for Developmental Disabilities and works as a research assistant with Dr. Richard P. Brinker and as a visiting lecturer in the Early Childhood Special Education Program at the University of Illinois.

What is Contingency Intervention?

Contingency intervention attempts to teach infants (birth to three) with severe and profound multiple disabilities that their actions can affect their environment. Its aim is to bring the child to the perception of himself as an active agent in his world. The child needs to be able to feel "I can make things happen."

Contingency intervention research, currently being conducted at the University of Illinois at Chicago under the direction of Dr. Richard P. Brinker, is designed for infants who are not interacting with their environments in an intentional manner.

Why is Contingency Intervention Needed?

Infants learn through cause and effect, and once they realize they can cause something to happen, they become more eager to explore the world. Infants with multiple disabilities are often incapable of motor activity and control; therefore, they are unable to interact with their environment and fail to develop the motivation to learn about people and objects in the world which surrounds them. Without contingency intervention, they may never realize that it is possible for them to cause something to occur.

In addition, parents and caretakers expect less from and react differently to an infant with disabilities, perhaps not interacting with him to the extent they would with a "normal" infant. Without social stimulation from his parents, an infant cannot develop optimally.

How Does Contingency Intervention Work?

An environment using switches is set up, whereby the kick of a leg or the movement of an arm will result in a consequence for the infant. When a child's action causes a consequence (music seems to be the best reinforcer), the child experiences contingency.

The Apple IIe computer is the "workhorse" behind contingency intervention. Using software especially designed by Richard Deni, the computer controls and records the intervention session.

The interventionist can specify beforehand which response will be reinforced (arm or leg), how many presses of the switch will be necessary, and how long the reinforcer will be activated (usually 3 seconds). The computer then records the switch presses during the session so conclusions about the infant's performance can be made. Each session is also videotaped for later analysis of effect (smiling, etc.) and positioning.

Children with profound multiple disabilities (24 months of age, but developmentally at the 2 month level) have mastered contingency problems (e.g. discovered that kicking a foot will turn on favorite music). The results for severely motor impaired infants can be especially exciting as a child who has been unable to control his environment finds that ability in this adapted setting.

What Next?

Once the child seems to understand he is having an effect on his surroundings, he is then observed to see if he **intentionally** sets out to activate that piece of his environment. From this point it is critical to change the problem to keep motivation high. The reinforcer, the required response, the number of switch presses needed, etc. can all be changed. This process can take 6-8 months to complete, and some children never attain the ability to differentiate responses.

Is Special Equipment Necessary?

The concept of contingency can be incorporated into early intervention programs even without the special computer software. Adapting the environment to give control to the infant is the most necessary element to successful contingency intervention. Adapting the environment for the responses that an infant has will give the "contingency experience"; kick switches on the crib or a mercury switch on the arm will reinforce movement.

In Dr. Brinker's Early Intervention program, social contingency is also emphasized by asking the parents to make some of their behavior contingent on the infant's responses. For example, Mom smiles and coos at baby for a minute and stops...Mom waits for an indication from baby that he wants more (smile, eye blink, body movement) before continuing. In this way the baby learns that he can affect his social environment. This is the beginning of communication.

Looking Ahead

Today's success with contingency intervention promises even greater things to come as technology opens the world to youngsters with disabilities. In the future, technology will make more creative options and implementations for environmental control in the early years available to infants with multiple disabilities. Once a child realizes he has an effect on and can control his environment, he realizes he is a part of that environment, not merely an observer. He belongs at last!

Spring 1990

ACTTive Software

Create Your Own Software? No Problem, with HyperStudio™

by Karen Lawson and Letha Clark

HyperStudio™, a software program from Roger Wagner Publishing, allows you to create your own software without any programming knowledge. What the Macintosh has done for "desk top" publishing, **HyperStudio™** has done for "disk top" publishing. It has given computer users who have no programming knowledge the tools necessary to construct their own software. Although commercial software for young children has improved in both quantity and quality in the last few years, **HyperStudio™** allows you to "fill in" the gaps in your own software library. The TouchWindow® or mouse may be used to operate the software you design, making this especially beneficial for teachers of children with physical disabilities.

With **HyperStudio™** software, a series of cards (think of them as index cards) is combined and referred to as a **stack**. You determine what happens on each card and how the child will move to the next card. **HyperStudio™** is designed to be used only on the Apple IIGS with one megabyte of RAM memory (after you become more involved with creating software, you will need more memory). Included with the software is a microphone and card (which does not take up a slot on the logic board) that enables you to record your own sounds and voices to use in your software programs. Sounds, art, and sample stacks are also included with **HyperStudio™**.

Scenes from "Class", a HyperStudio™ stack created with Computer Eyes™. Selecting a child from the classroom scene moves to a close-up of the child. Clicking on the child activates the child's voice. Clicking on the name,returns the user to the classroom scene.

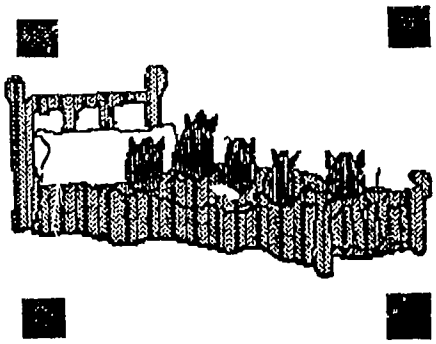
Applications

We have used **HyperStudio™** in a number of ways with preschool children. By "dumping" paused images from a camcorder into **Computer Eyes™** (a video digitizer which allows you to import pictures from videotape to your computer), importing these images into **HyperStudio™**, and adding children's voices from recordings made in **Sound Shop** (part of the **HyperStudio™** program), our first attempt became a program called **Class**. Ideas for this program were based on two needs: the most common delay in our children was language development,

and secondly, it was the beginning of the school year and the teachers wanted a way to help the children quickly learn the names of the other children in their class. The program is set up so that when a child uses the mouse to click on an image of a child in the classroom, the next image is a close up of that child and the user hears that child saying her name.

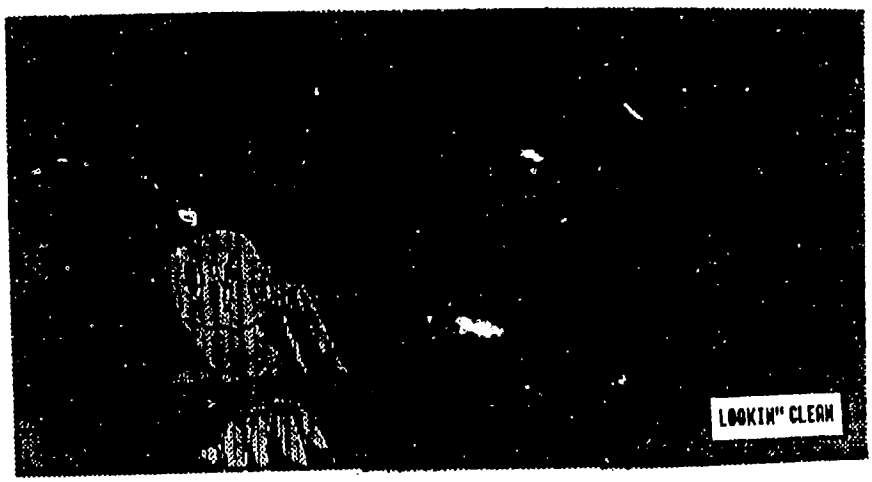
The next software we developed was based on a rhyme the children loved and often requested. "Five little mice jumping in the bed. One fell out and bumped his head. Called for the doctor and the doctor said, 'That's what you get for jumping in the bed!'"

The rhyme was broken down into four lines and a child recorded each line separately. Although the drawing was done by an adult, it could easily have been done by children. Adults developed the animation. Four squares, each a different color, were added to the corners of the screen. When the child pressed a square, he/she heard one line of the poem and saw corresponding animation. The child's goal was to activate the lines of the rhyme in proper sequence.



Clicking on one of the squares in the corners of "Mice" activates one line of the poem.

After becoming more familiar with **HyperStudio™**, you become more adventuresome. The next software we developed, **Sing-A-Long,** was based on the children's art work. We selected characters from the children's drawings and reduced them on the photocopy machine so they would be easier for the children to scan. Drawings were scanned with the **Quickie™** hand held scanner. Once the drawings were scanned into the computer, we animated them. The children then recorded their songs in **Sound Shop.** The children especially loved recording their voices, adjusting the playback speed, playing rhythm instruments, and developing their own "rap" tunes. We played their songs and adjusted the playback speed until they were satisfied with them. We also videotaped their movements as they sang, and incorporated the same movements into the animation of their characters. Accessed by a click of the mouse on a character, the final product shows the characters dancing as a child's voice sings a rendition of such favorites as **Did You Feed My Cow?** or **Peanut Butter and Jelly .**



Lookin' Clean and Head Start Kid are two singing and dancing characters from "Sing-A-Long."

HyperStudio™ has enough features to encourage you to explore your own potential, and the open-endedness of the program allows you to be limited only by your imagination.

If you have not explored **HyperStudio™**, do. Your children will help you find ways of using it you hadn't even thought of, and your software library will grow very quickly. If your stacks are small, you can easily install files from **HyperStudio™** which will make your disks self-booting. The stacks you create with **HyperStudio™** may be shared as public domain without royalties being paid to Roger Wagner Publishing. However, a $100 fee must be paid to Roger Wagner Publishing if you intend to sell the software for profit.

HyperStudio™ 2.1 costs $150. The new **3.0** will sell for $180. If you have **2.1**, an upgrade to **3.0** will cost $45. **Computer Eyes™** is available from Digital Vision for about $250. The **Quickie™** scanner may be purchased for $300 from Vitesse.

If you would like a public domain copy of the program "Mice", please send $5 to cover postage, handling, and disk costs to: Mice, c/o Project ACTT, 27 Horrabin Hall, Western Illinois University, Macomb, IL 61455.

Fall 1991

Creating a Personalized T-Shirt

by Carol Schneider

Content Area: Symbol development, abstraction, fine motor, language enhancement

Child Objectives:

1. Use the mouse or keyboard from the Apple IIGS computer to draw.
2. Indicate awareness of how lines or symbols are being made when using the mouse or keyboard.
3. Develop self-constructed symbols.
4. Recognize colors and his/her name.

Materials:

Apple IIGS computer with color monitor
Print Shop IIGS (Broderbund)
ImageWriter II printer
ImageWriter 4 color heat transfer ribbon
T-shirts
3 1/2" or 5 1/4" ProDOS data disk
Computer printer paper
Iron and ironing board

Teacher Preparation:

Have each child bring a clean t-shirt from home. Familiarize yourself with the software program. Make a sample t-shirt ahead of time.

Related Activity:

1. Children can draw t-shirt designs on paper first.
2. Talk to the children about the design they made.
3. Set up a related drawing activity where the child uses fingers, hands, or fists to make lines, swirls, and symbols.

Computer Activity:

1. Have one or two children approach the computer. Ask one child to insert **Print Shop** into the 3.5 disk drive. Ask another child to turn on the computer and monitor.
2. Select "Graphic Editor" from the "Main Menu". Demonstrate the program for the children or have a child demonstrate how the program works. Let the children take turns creating their own t-shirt design.
3. Once a child has created a design, select "Save". Give the design a name and save it to disk. "Quit" and return to the "Main Menu".
4. From the "Main Menu" select "Sign", "Design Your Own", "No Panel", and "No Borders" options. When choosing a graphic, select "From Other Disk". Choose the child's design.
5. Let the child choose a font. Select a color and enter in the child's name. When done, under the Print Options, choose "Set Print Options". Select "**Backwards**" and "OK". Print out the design onto the computer paper.
6. Once the design has been printed, cut the design into smaller pieces if need be. Prepare the t-shirt by placing computer paper between the ironing board and the shirt itself. Adjust the graphic onto the t-shirt. Apply a hot iron onto the graphic. Do not move the iron in circular motions. Hold the iron down for several seconds using up and down motions. The personalized t-shirt will then be done and ready for wearing.

Helpful Hints:

The first time the t-shirt is washed, wash in cold water and vinegar to set the colors in. Then wash as usual.

Variations:

On the Apple IIe computer, use **The Print Shop** (5 1/4" disk) and select the "Graphic Editor" from the main menu for making the original design.

The children can make a special t-shirt for the special helpers (parents, grandparents, volunteers, program assistants) in appreciation of their service to the classroom.

During a computer workshop for teachers and/or parents have the materials available so everyone can make a t-shirt transfer for a t-shirt.

Adaptations:

Auditory Impairment: Use sign language for directions.

Visual Impairment: Have the child follow directions from a sighted peer. After the t-shirt is done, apply puffy paint onto the t-shirt design.

Motor Impairment: This activity may be setup with the Adaptive Firmware Card.

Switch Use: For a setup that will provide an automatic scanni ɛ and alphabet array do the following:

1. Boot backup copy of AFC Menu **and Construction Disk**.
2. Press **6** to move the cursor down on the menu disk.
3. Move the cursor to "PrintShop scan+ PrintShop" <Return>.
4. Select "LOAD THIS SETUP" **<Return>**, turn on your AFC, and remove your AFC setup disk. Insert PrintShop and press **<Return>**.
5. Insert switch into the AFC I/O box.

Winter 1991

27

A Customized Switch Holder for Switch Placement on a Child's Wheelchair Tray

by Carol Schneider

Many children access the computer while positioned in their wheelchair. While the monitor is placed at eye level the child must concentrate on activating a switch. Even though a switch can be secured to a wheelchair in different ways to allow switch access for a variety of movements (e.g. head, legs, or foot) a majority of children use their arms, hands, or fingers for switch access. Many times these switches are temporarily secured onto a child's wheelchair tray with masking tape, duct tape, or dicem. This may be appropriate for some children, but other children may become involved with the tape itself or remove the switch from the tape or dicem.

Project TTAP's answer to this problem is a customized switch holder. Project TTAP has used a switch holder during assessments and found it very helpful for stabilizing a switch. The holder also conceals the switch cord and removes another temptation from the child's reach.

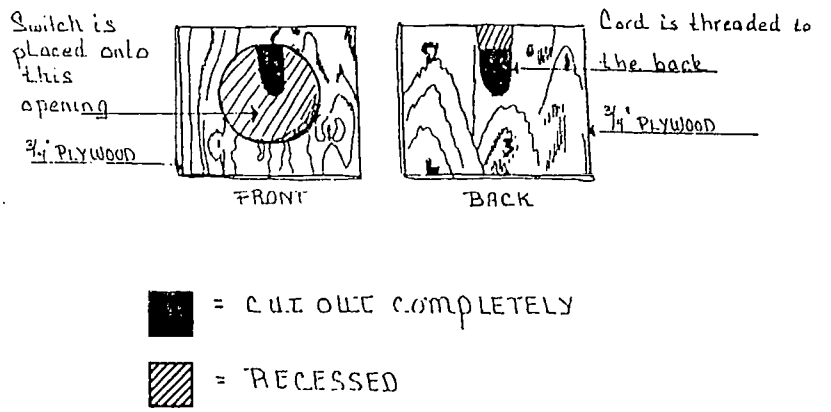
With help from a carpenter or handyman, you can make an inexpensive customized switch holder from scrap plywood. When placed into the holder, the switch can be securely attached to the child's wheelchair tray with clamps so it can be easily accessed and activated by the child. When a switch is in a secure position, the placement will allow the child easy access to the switch.

Directions for Making A Customized Switch Holder for the Big Red Switch

First, assemble the necessary materials. You will need 3/4" scrap plywood (preferably AC grade), a circular saw, a saber saw, a router with rabbiting and rounding bit, sand paper, varnish and/or paint, and a Big Red Switch (AbleNet - $35.00). Portable clamps are optional.

Next, study the application of the switch and determine how to work the wood to adapt to the switch. Cut the 3/4" plywood to fit securely on top of the child's wheelchair tray. After determining the correct placement of the switch, trace the switch onto the plywood, leaving a 3/8" lip on the inside. With the saber saw cut the traced circle. Using the router with the rabbit bit, make a ledge to hold the switch so that it will be recessed. Rout around the switch's shape. Remove the unnecessary wood with the router. Place the switch into the hole. Check for adjustments. Remove the switch and make final adjustments. Router an additional straight line underneath the plywood so the switch's cord can pass through. For a smooth outer edge, router the outside edge of the holder with the rout and rounding bit. Sand the holder till smooth. Finally, paint or varnish the holder.

Directions for Cutting the Wood for Your Switch Holder



When the paint or varnish has dried, insert the switch into the holder and place it on child's wheelchair tray. Use a portable clamp to secure the switch holder, if necessary. Plug the switch into the switch interface box or a battery-interrupted toy. The switch is now ready to use.

Any type of switch may be used. Just adapt the wood to fit the switch. When painting or varnishing the holder, be creative and include the child's name, graphics, and/or a favorite sticker.

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Dunamis ToolKit 4: Is It Hardware OR Is It Software????

by Letha Clark

When I see "toolkit" my first reaction is likely to be panic. Visions of hammers, power tools, nails, lumber, drywall, paint and wall paper flash through my mind. What wall are we tearing down now? Are we closing in another doorway? All reasonable reactions of a reluctant remodeler. Take comfort, as I did, in what Dunamis really meant when they released the PowerPad™ ToolKit 4 ($99.95) for the Apple IIe and IIGS. Actually you can "build" or construct or "remodel" or modify with this recent product release, and best of all it doesn't create its own mess!

This software program enables you, the teacher, parent or care giver, to design and construct PowerPad™ software specific to your child's needs. It provides ways for you to incorporate what you know about a child into her very own computerized learning activities. By making set-ups increasingly more difficult, the software you create can "grow-up" with the child. Designed to be user friendly, on-screen instructions "take you by the hand" and lead you through the creation process.

Before you begin, have your idea and a ProDOS formatted disk ready. Determine the number of active PowerPad™ buttons. Choices begin with one button and end with 144 buttons. You'll probably choose a button number closer to one for the first overlay. You can add graphics, create the illusion of animation, add music (there is a two octave range), show text on the screen (it is not large) and add synthetic speech (the pitch can be altered) to each button. Use one or all of these options for any button. The sequence for these options can also be different for each button. Perhaps you might want to plot your idea in a smaller scale and see what it looks like.

Your ToolKit includes a picture disk and set-up disks. Review the pictures on the disks; you might want to use some of them. If not, locate other black line drawings (coloring books are excellent) to scan (the Vitesse Quickie Scanner™ is recommended) or reproduce with a graphics tablet such as the KoalaPad™ ($139.00). Another source would be the child's own art work. Most pictures will be too large, so carry them to your friendly copy machine and reduce the size. A four inch image seems to work well. Use the Paint.Std.HIRES option and load all graphics, either scanned or drawn into 816/Paint ($75.00). Utilize 816/Paint to clean-up your images. Unfortunately there isn't a clean-up command; you'll have to do the dirty work one pixel at a time. Getting the graphics ready to use is not difficult but is the most time consuming part of the process. Graphics are then saved UNPACKED to your formatted disk. If you use a 3.5 inch disk you can take advantage of storage space for memory-hungry graphics. Use the same disk to save all graphics related to a particular child. The disk can then become that child's disk.

A created set-up is easy to modify and just as easy to copy. If you have a set-up for Michael that would also work for DeAndre, copy and then modify it by adding DeAndre's name or a picture that is special to him. Changes such as this take only a few minutes.

Pictures for the PowerPad™ overlay can be printed using your ImageWriter II printer. Color graphics can be printed with the addition of a 4-color ribbon. ToolKit comes with a pad of PowerPad™ size paper, just right for mounting the printed pictures for an overlay. Laminate the overlay so your work will last more than one session.

Soon to be released is the ToolKit Developer's Package ($59.95) which will enable you to make each ToolKit set-up disk self booting. You can order it now and be put on a waiting list for shipping. Use your child as the inspiration and her needs as an objective to work toward. You can transform your PowerPad™ into a talking word board, a game board and a customized storyteller. If you hit a snag you will find the Dunamis people supportive and anxious to assist.

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tives and activities. At this time, begin demonstrations of computer use, software, and peripherals.

Designing group experiences for individuals with wide ranges of computer ability and understanding is challenging. Dividing participants according to varying experience or allowing the children to help their parents are helpful strategies.

Workstations provide essential hands-on computer time. Parents who leave the workshop after practicing skills or trying out strategies tend to implement them into day-to-day activities more than those parents who have only been lectured to or who have passively watched others participate.

Once each participant spends sufficient time at a workstation, assemble the entire group for sharing experiences and asking questions. Before closing, ask parents to evaluate the workshop. Accomplish evaluations through informal discussions or written questionnaires. Participants' answers will help you modify objectives and activities for future workshops. Among questions you might ask: How useful were the workshop materials? What new knowledge did you gain in regard to computer intervention? In what way was this a worthwhile experience for you?

End on a positive note. Thank all participants and, as each family departs, present them with a certificate of attendance. These can be created with *Certificate Maker*.

Benefits of Family Involvement

When parents become active participants in the child's educational program and generalize classroom skills to the home, the child becomes more competent in both environments. By working with more complete knowledge of the child and his disabilities, both parents and professionals can provide more appropriate instruction and care for the individual child. Fewer communication/information gaps exist between home and school, and parents' active participation allows the child to demonstrate accomplishments that might otherwise go unnoticed outside the classroom.

The preceding article was excerpted from the MicroApplications Module ***Strategies for Family Involvement****. More about family involvement benefits and activities is included in ACTT's new curriculum guide* ***Building ACTTive Futures*** *or in* ***Strategies for Family Involvement****, available from Macomb Projects.*

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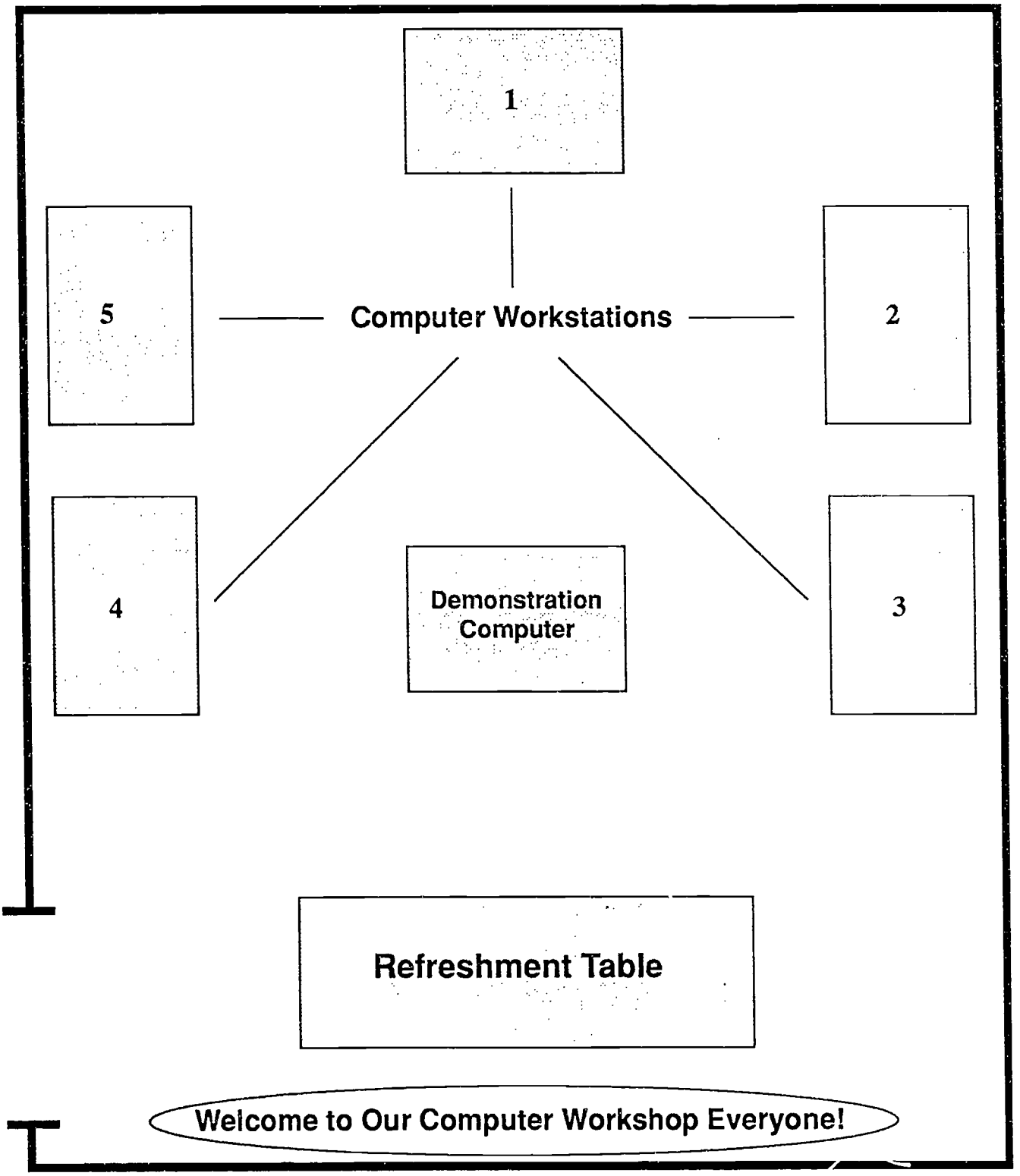
Suggested Room Arrangement for the Workshop



Selected Software for Five Computer Workstations

Although parents enjoy using *PrintShop* during their introductory computer workshop, as their computer confidence and competence increase, organize workshops that introduce them to the software and peripherals their children are using. Below are software and peripheral suggestions for each computer workstation. Limit the software programs to two at each station to give parents plenty of opportunity to examine each.

Workstation 1 — Keyboard program: Use software programs that will change the picture based on when any key is pressed. Suggested programs: **Sparkee** (Public Domain), **Fire Organ** (Public Domain), and **Hodge Podge** (Dynacomp).

Workstation 2 — Keyboard program: Use programs, such as **Stickybear ABC's** (Weekly Reader), for which any letter key changes picture or action, or **Charlie Brown's ABC's** (American School Publishers), for which double input of the same letter key produces animation.

Workstation 3 — Keyboard program: Use programs that operate only with specified keys to change the action or make a selection. We recommend **Mr. and Mrs. PotatoHead and Peanuts Picture Puzzlers** (American School Publishers), **Stickybear Opposites and Stickybear Numbers** (Weekly Reader).

Workstation 4 — Alternate input: Demonstrate software controlled by simple alternate input devices such as switches, a joystick or game paddles, or a mouse. **The New Cause and Effect,** (Public Domain), **Katie's Farm and McGee** (Lawrence Productions), **The Playroom** (Broderbund), and **The Explore-A-Story Series** (Learningways) are recommended for this station.

Workstation 5 — Alternate input: Demonstrate software controlled by the PowerPad™, TouchWindow®, KoalaPad™, or Muppet Learning Keys™. Use one device with one or two appropriate programs, such as **Peek & Speak** (ACTT), **Muppets On Stage** (Sunburst), **Exploratory Play** (PEAL), **Creature Chorus** (Laureate Learning Systems), **Touch And See** (Edmark), **Micro-Illustrator** (Dunamis), **Wheels On The Bus** (UCLA/LAUSD), **KoalaPainter** (Koala Technologies).

Please note: If possible, station an aide near each computer to explain the correct use of the software and peripherals. As parents learn, they will soon be helping each other. The suggestions herein are intended merely as guidelines. Adapt your computer awareness workshops to the equipment, software, and staff you have available.

Families Go On-Line with Computers

by Patricia L. Hutinger

Children's excitement about working with computer technology is contagious! Even fathers who don't usually want to get involved may suddenly show interest when their youngsters begin to talk about computers at home. Mothers whose only familiarity with computer printouts is a grocery check-out receipt are sometimes hesitant when they find out that their children know how to operate a computer, but many of those mothers soon find that they too can use computer technology. Children who have learned to operate computers in preschool programs often can help others, including their families, learn to use hardware and software. But what does this mean to Head Start programs or preschool programs for children with disabilities? Computer workshops for families successfully provide families with technology-age skills and can be adapted in a variety of early childhood programs, including Head Start, after staff are trained and computers are initiated into the program. Family computer workshops, the topic of this article, are one parent participation strategy used in Project ACTT (Activating Children Through Technology). Other individualized approaches are also used. ACTT staff have been working with families of children with mild to severe disabilities for the past six years. We are now translating that experience into work with Head Start families in the PACT-ACTT Partnership in an urban and rural program in west central Illinois. Macomb Projects' staff members Amy Bruns, Letha Clark, Carol Schneider, and Linda Robinson have worked extensively with parents, developing the plans and activities in this article.

Workshops and training are based on direct experiences with computers instead of watching someone else use the equipment. ACTT operates on the assumption that adults who see the computer as a useful personal tool for themselves are more likely to incorporate computer use into daily activities for children. Tool use for teachers and families includes word processing, data bases, spread sheets, and other applications. The tool function allows for newsletter production, notes to individual families, resume and letter writing, anecdotal records, bookkeeping, information retrieval and electronic communication. Teachers and family members determine which functions are most appropriate for their own use. Curriculum use with children is a major tool function emphasized in training.

Early childhood personnel must be confident in their own skills in using computers both with children and as tools to accomplish paperwork before they are willing to bring families onto the technology scene. This means ongoing effective staff training in the uses of technology. Further, computer equipment (the computer, color monitor, and printer) must be available on a regular basis, and personnel must have access to appropriate software to use in curricular activities. Administrative support for technology applications is crucial in ensuring that teachers have the necessary resources and competence.

A set of competencies accompany ACTT training so that teachers and staff can keep track of the skills they have acquired and those they need. When staff feel that they are competent users themselves, they are ready to share the computers with children and families. Then computer workshops can begin for other staff members and family members. A Macomb Projects video module titled "Strategies for Family Involvement" is used to help staff learn to give computer workshops.

Families can be involved with classroom computer uses at three different levels in the ACTT Curriculum depending on their needs and interests. At the awareness level, newsletters and meetings provide information. At the observation and assistance level, parents assist in classroom computer activities. At the third level, they plan and carry out classroom computer activities. A specialized set of parent computer competencies is used to determine the individual needs of family members and provides a blue-print for their workshop experiences.

A number of early childhood programs, including the PACT-ACTT Partnership, use the strategies developed by ACTT in its work with preschool programs in public schools across the nation. A yearly plan for parent technology workshops was developed and integrated into parent meetings. In the Springfield Head Start Program, parent meetings are held once a month on Fridays. For the school year 1989 to 1990, these parent meetings took on a new look when they were extended to include "Computer Involvement Workshops."

The calendar for the parent workshops, planned in advance, includes an initial "Project ACTT Kick Off Awareness" session. During the first workshop, parents complete a "Parent Computer Competencies" record to be used during the entire year. They also learn about the potential of computers in their child's curriculum. ACTT trainers often assist in the first workshop, even though teachers have been trained to be computer users. We've found that it takes some time before new computer users feel confident enough to train other adults to use technology.

The monthly workshops are initially organized according to topics ACTT staff have tested with other families. Changes are made as families make suggestions or show differing needs. The first workshop usually covers use of the software program "Print Shop." Announcements, signs, letter head, banners, greeting cards, and certificates can be made on the computer. Individualized or group workshops centering around word processing, data bases, spreadsheets, and electronic communication are scheduled as parents express interest.

Next, families are introduced to "Computer Curriculum Activities in the Classroom." Various computer activities are demonstrated and tried by parents. Another workshop topic is "Printer Games". Parents use software programs that specifically use the printer. Programs such as **Explore-A-Story** or **Create with Garfield** allow the user to select scenery and characters, place them in a picture, and add words to create a story which can then be printed out on paper. Parents enjoy making pictures and cartoons as they learn about printers.

"Off-computer Activities at Home" features a make-it and take-it session. Parents learn how to make off-computer activities at home with materials they don't have to go out and buy. Off-computer materials may consist of a cardboard model of a computer with an egg carton keyboard for 'pretend' use at home, or mazes and games to reinforce concepts of right and left used in LOGO, a program used for problem solving activities.

The focus of another workshop is "Setting Up the Computer Environment." Parents learn the important features in determining how their child's computer learning environment is set up at school or how it could be set up at home. During a meeting near the end of the year, parents complete the computer competencies, and preparations are made for the following month's "Computer Open House." Staff, parents, support personnel and children are involved in this open house which provides an opportunity for children and parents to show what impact computer technology has made on them during the past year. After participating in monthly meetings, parents not only know more about their child's computer activities but also gain knowledge and confidence in their own computer skills.

The series of training workshops leads to more active involvement in the children's program, provides the beginning of a possible new work skill and tool of society, and increases learning experiences that facilitate "growing with your child." Sometimes children even help teach their parents. Parents and children have common topics of interest and conversation about the early childhood activities and share an active relationship with the program personnel. Often parents express surprise and pleasure that they, too, have entered the electronic age. One mother said, not long ago, "Can you imagine? Me on a computer? I never knew it'd be this easy!"

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Helpful Hint

When parents, teacher aides, or substitute teachers are in the classroom to assist children at the computer, valuable time may be lost because they are unfamiliar with the programs, proper positioning for the child, the adaptive equipment required, or the child's goals. You can help such assistants provide constructive computer time for each child.

Keep an index file card for each child in a file box near the computer station. On the card list the goals from the child's IEP or IFSP, along with recommended software for attaining each goal. List the adaptive peripherals required for the child, as well as any positioning that may be needed.

The index file card is also an excellent means to chart a child's progress by listing dates certain objectives were begun and dates they were achieved. Use the cards to keep track of which level a child is on in a specific software program or which game on the disk the child should use.

Not only do these cards provide useful information to a person who is assisting the child, but later you will find them useful sources of documentation for writing progress evaluations or program reports for each child.

Spring 1991

How to Make a Turtle Cursor

For Use With Logo PLUS and ACTT Instant* Logo

by Karen Lawson

The concepts of directionality—forward, backward, right and left—can be confusing to a young child. As we mentioned in the Spring newsletter, Logo is a good tool to use for helping young children develop these concepts. However, the triangle shape of the cursor often confuses young children. We suggest changing the cursor from a triangle to a turtle shape, so children can more easily identify which direction the cursor is facing. Transferring these concepts of directionality from two dimensions to three dimensions will also be easier when children have had experience working with the turtle cursor and follow up with an activity using the Valiant Turtle robot. Directions for changing the cursor's shape follow.

Boot **Logo PLUS**
At the **?** prompt, enter **EDSHAPE 11**
Use the arrow keys to move the flashing cursor up, down, right, and left. Press the **spacebar** to fill or clear a space. Press **B** to locate the center of the shape (where the logo drawing and turtle trail originate. In Figure 2, the darker square indicates the location of this point).
When completed, press **Control C**
Enter **SETSHAPE O** and press **return** (you will see a ▲)
Enter **SETSHAPE 1** and press **return** (you will see)
Enter **SAVESHAPES "TURTLE** and press **return**
Your turtle cursor is now saved on your **Logo PLUS** disk.

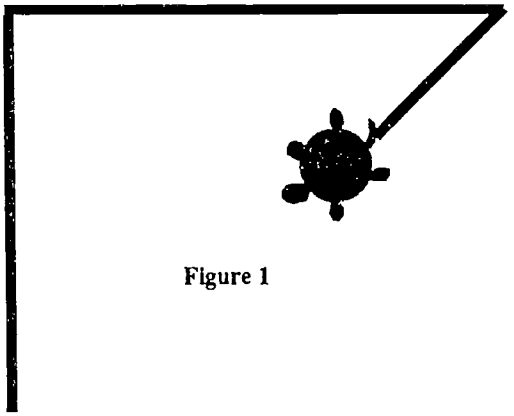

Figure 1

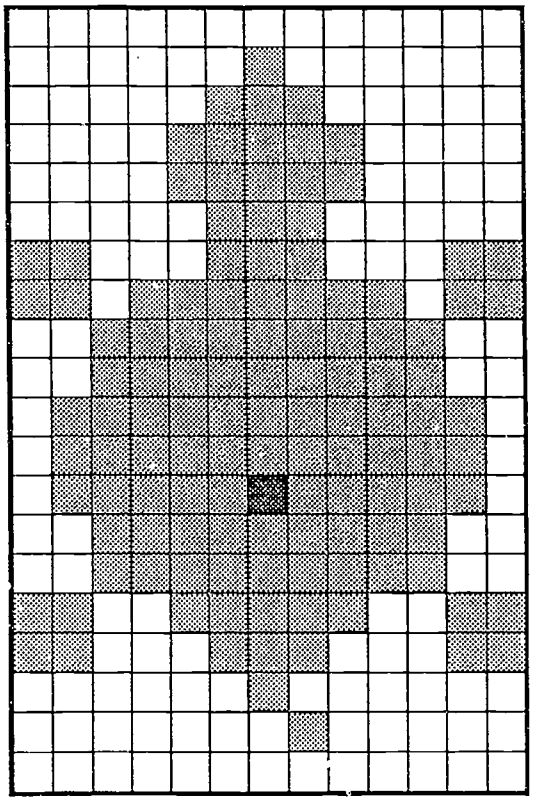

Figure 2

To boot **Logo PLUS** using your turtle cursor:
Boot **Logo PLUS**
At the **?** prompt, enter **READSHAPES "TURTLE**
Enter **SS 1**
Enter **READ "INSTANT**
Enter **INSTANT**

***Procedures for ACTT Instant are given in** Building ACTTive Futures.

Summer 1991

The Importance of Software Evaluation

by Carol Schneider

Software evaluation requires *time; written* software evaluation requires *more* time. Why is writing a software evaluation even necessary? Although it is time consuming initially, filling out a software evaluation form actually *saves* time later. A completed evaluation form provides:

1) A general description of the software, documentation, and required peripherals.
2) Easy reference for developing a lesson plan or curriculum activity.
3) Information on how the software would/would not meet the needs of your program or classroom.
4) Identification of the software that is readily available for each grade level and/or handicapping condition. This information in turn provides for a more complete offering of software for each classroom, population, or handicapping condition.
5) A helpful resource for additional comments on the effectiveness of the software after it has been used within the program or classroom.
6) Easy and accessible recommendations on software to other staff.
7) Documentation for budget justification for software purchases.
8) Documentation for grant writing.

The ACTT Software Evaluation form (see page 44) was designed for easy reference. This form contains areas for general information about a software program, a description area, and a content/educational value rating scale. Users can easily add other content areas to the form either in the description area or on the back to customize it for their own use.

If possible, evaluate software prior to purchasing it. If that is not feasible, evaluate it immediately after purchase. Examine it first for damage; if it has been damaged during shipment, read warranties, guarantees, or return policies. Most software companies allow thirty days for a full refund or credit.

Once evaluation is complete, file the form in a notebook or file folder where it can be found for easy reference. Once you accumulate many evaluation forms, you will want to enter them into a data base on your computer.

Remember, time spent now evaluating software is time saved later when all the information you need about a particular program is as close as your filing cabinet or computer data base.

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Project ACTT Software Evaluation Form

Reviewer_____ Date _____
Program Name_____
Company Name_____
Price_____
Equipment Required_____
Content Area_____
Skills Necessary _____

Summary

	Poor	Average	Excellent
Quality of Content			
Educational Value			
Instructional Design			
Usability			

Recommend to Others Yes No

Capable of Adaptations Yes No

Description

Poor	Average	Excellent	**Content/Educational Value**
			1. Objectives are clear.
			2. Appropriate preteaching and follow-up activities are suggested.
			3. Content is clear and appropriate for the target age/grade level.
			4. Content reflects objectives.
			5. The amount and difficulty of any reading is appropriate.

Poor	Average	Excellent	**Instructional Design**
			1. Can the rate and levels of difficulty be adjusted for individual users?
			2. Usable for groups.
			3. Program stimulates user interest and active involvement.
			4. Program moves from level to level at appropriate intervals.
			5. Graphics, sound, and color are utilized.
			6. Positive feedback is effective.
			7. Negative feedback is effective and not reinforcing.
			8. The display is clear and effective.

Poor	Average	Excellent	**Usability**
			1. Wrong key and wrong time input errors are handled well.
			2. HELP instructions are available on screen.
			3. The program operates quickly.
			4. Exits can be made easily, quickly, and safely.
			5. The program has sufficient instructions for easy use.
			6. The documentation/manual is clear and effective.
			7. The program accepts user's adaptations (i.e., alternate input devices)
			8. Detailed and accurate records of responses are kept.

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In Their Own Words....

by Linda Robinson

This is the first in a series of three articles on the benefits and applications of computer technology for young children with disabilities. These articles are testimonies by the teachers in West Central Illinois who have been using computers in their early childhood programs for the past six years. We will begin with Birth to Three programs here and cover preschool and severe disabilities classrooms in future issues.

Sue Marshall is a Child Development Specialist for the Birth to Three program at McDonough County Rehabilitation Center in Macomb. She conducts the Tots Learning Center two days each week for ten children, and also works with parents and children throughout the county during home visits. The computer is used during center time for individual and group activities.

Nancy Romine is the Director of the Birth to Three Program at Warren Achievement School in Monmouth. Pam Dunn is a Parent Infant Educator who teaches in language development classrooms and conducts home visits in the same program. The computer is used as a center activity in the classroom for parents and children. Pam, Nancy and Sue talked with us recently about the benefits and applications of technology in their programs.

On Providing a Sense of Control....

Sue - I think it's really important for these children who have a limited ability to really act on toys, to use this kind of an adaptive system.

Pam - Some of the children that are very physically involved have a difficult time exploring their environment, developing this sort of cause/effect relationships that mobile children are able to develop. And the control over their environment is difficult for them to achieve, so using the computer allows them to learn cause and effect relationships and also to learn that they can have an impact on their environment.

Using Technology for Equalizing Play....

Sue - Now for the more physically disabled kids who can't manipulate toys it's one way for them to be able to do the same thing that the other kids can do.

Nancy - It gives them a chance to be equal with the other kids that may be using, for example, the little toy, the little dog, if a physically handicapped child couldn't actually manipulate that. By pressing a switch it equalizes his chance to be able to use things through play or other instances of his environment.

Achieving Developmental Goals.....

Sue - Attention Span - One thing I've seen is it really motivates them to sit in one place for a length of time and work on one task. It would be increasing their focus and also, a lot of times they have to wait for me to fix something in the computer that's not working right and a lot of them build up quite a bit of tolerance for waiting.

Fine Motor Skills - Fine motor kinds of skills relate many times, for physically handicapped kids, to their occupational therapy or physical therapy goals. Depending on what kind of switch you're using or if you're using the keyboard, you might be working on individual finger movements on a keyboard, using a pointing gesture on a keyboard to press keys on a point.

Nancy - Attention Span - It really keeps their attention. It helps kids who have really short attention spans.

Language - We might use the computer to have children identify body parts, name pictures, match objects and pictures to increase vocalizations to get them to imitate the sounds. Even children that aren't saying words will vocalize more and make more sounds when they're working with the computer.

Social - Everybody wants to use it at the same time, so it at least helps with the turn taking aspect of it.

On Parent Involvement...

Sue - I think they do enjoy seeing their children use such a sophisticated piece of equipment. For many families learning how to use the computer -they feel good about learning it themselves. They find it's not as hard as they thought it would be. I think they do look at it as being a real positive thing for them and their children.

Pam - We always include the parents when the children sit down to work with the computer and encourage them to play with the child on the computer and they seem to really enjoy that sort of activity, because it's something the children are successful at and there isn't any wrong or right way to do it.

Overall - I think it's a good medium for all kids . . . it's a good way for them to learn about other things in a different way.

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In Their Own Words...

by Linda Robinson

This is the second of three articles on the benefits and applications of technology for young children with disabilities. These articles have been compiled from interviews of the teachers in West Central Illinois who have been using computers in their early childhood programs for the past six years. The focus of this issue is the preschool classrooms.

Preschool teachers from four area classrooms in Bushnell, Galesburg, Colchester, and Ferris, Illinois, have been using computers in their curriculum for the past six years. All have agreed that technology offers benefits in various areas of development. The following views were recently expressed to us by three of these teachers, Jean Davenport, an Early Childhood Handicapped teacher at Bushnell Prairie City Community Unit School District #170 in Bushnell, Illinois, and Cheryl Hager and Mary Ann Hale, who team teach preschool children with disabilities at L.T. Stone School in Galesburg, Illinois.

On Technology as an Alternate Means for Achieving Goals

Cheryl: It's just a part of the classroom that we wouldn't want to be without, because it is very motivational. The computer does get their attention and it is something with which some of the children can be successful when they can't really be successful with other things.

Mary Ann: I really think a part of it is that there is a lot of motivation in a computer. It's visual, moving, and talking too! It's doing things and it puts everything together, more than you can get out of a picture card or activity at the table. It's spontaneous; the screen is moving and it's right there for them.

Jean: I've seen children that may not play so well together with other toys, but you put them on a problem solving activity with Logo, and they really work together to try to come up with a solution.

Using the Computer for Language Development

Jean: A child who is really delayed in speech and language will talk more when we're using the robot or Logo. And it makes children share and work together.

Cheryl: We find all our software will work with our kids who are coming to the program nonverbal. It's motivating as opposed to sitting down with them with picture cards and naming the picture card and expecting a response. I'm not saying that's not successful, but we are more successful with the computer. It gets their attention, we get the "oh's" and "ah's" and "uh-oh's." Some of the first words we have heard from kids have been while they are using the computer.

On The Benefits of Using Logo

Jean: I find that Logo is really good for integrating all the skills that we are working on in the classroom. It's good for language skills. It's good for problem solving to work on creativity, creative thinking, math skills, and perceptual skills. We really use it for a lot of different things, and I do a lot of off-computer activities to enhance learning to make it more concrete than what it is. One thing I really like about Logo is that children can make a mistake and correct it right away or change it and there is not someone sitting over there saying you did it wrong. I think that's a real good way to teach, to let children correct their own mistakes and do it instantly if they want to. And that builds good self-confidence for them.

Enhancing Social Skills

Mary Ann: Mostly it's turn taking; everybody wants to use it. And they learn quickly that everybody gets a turn, and they only have to wait a few minutes.

Jean: Logo makes children share and work together to solve a problem. How do we get the robot from here or how do we get Terry the turtle from one point to another? They have to think together and work out a solution.

Involving Parents in Computer Activities

Jean: Parents come to pick up their children; then the children will drag the parents over to the computer and say, "Look at what I've done! I can make the turtle move! "

Cheryl: With our more involved kids, it's something they can do. They can be in control. It even helps the parents to see their child who hasn't been able to do a lot of things. The parents feel so good about what their child has been doing in school; sometimes we invite them in to sit with the child and work on the computer. It's motivating for everybody.

Mary Ann: It [the computer] is such an integral part of the program that we wouldn't be without. It works well with parents; we've got parent interest because we are using a computer that a lot of the parents didn't use, so they enjoy it and think it's really neat that their kids are working on a computer.

Cheryl's words sum it up: **"I can't believe we ever had a classroom and taught without a computer."**

Winter 1990

In Their Own Words...

by Linda Robinson

In this last article of the three part series on the benefits and applications of technology for young children, we will turn our attention to the teachers and parents of children with severe disabilities. For them, technology is not only a functional tool which is needed as voice and print output for their children, but it also provides valuable feedback on the child's abilities.

The following thoughts and ideas are those of Denita Johnson, a teacher with the West Central Illinois Special Education Cooperative in Macomb, Jan Scott, a teacher at Warren Achievement School in Monmouth, Illinois, Jim Keefe, a school psychologist and Vice President of Warren Achievement Center in Monmouth, Lynn Priepot, a teacher at the Quincy School for the Handicapped in Quincy, Illinois, and parents, Jerry and Leslie Lewis.

As is the case with most adults who are presented with a computer for the first time, Denita Johnson was hesitant to use technology with her children who had severe disabilities. "My first feelings were that computers are not going to help my students. I would not work with the students on the computer during my first year of teaching. I let a specialist come in and work with them. But then the next year I got myself more involved and said, 'Hey this is going to work."' Denita changed her mind about the computer because "I was seeing the kids doing something on their own and they were excited that they made it happen. I wasn't the one making it happen. They were doing it themselves."

Achieving Skills

The computer has now become a part of each child's educational plan in Denita's classroom. "When I write out the IEP, I will put down the computer for methods and materials. I think the child needs to know that the computer is going to be used in different situations, not just learning pictures on a PowerPad." She feels the computer can help with many skill areas. "Besides cause and effect, we are working on attending skills, both visual and auditory attending. We have them look at the monitor for a few seconds. For a blind student, it's being able to hear the speech and make something happen." This auditory stimulus is one area in technology that Jim Keefe feels is overlooked. "I have talked to several people in the last few months who have found ways for the computer to be useful for the child who didn't have much vision, because of the sound that it can present. We usually think about the exciting things that happen on the screen, but the auditory is very important also."

Equalizing Play

Often the computer is used only on an individual basis with the students who have severe limitations. But Denita has found that technology offers a means for equalizing activities for children. "We do some group activities for self-care and social skills. For self-care we work on brushing hair and brushing teeth. We use the program called "Morning Song" which sings to the children. As we sing to them, they are looking at the monitor, and we work on brushing with them. I have one student who is now able to bring the toothbrush to her mouth and is very pleased with herself." With the group activities, "it allows the students to see that they are interacting with each other with the computer. They are able to see that, 'If I press something, you know something is going to happen."'

Jan Scott agrees that using technology with two children at a time has many benefits that you do not usually see with other classroom activities. "It's a great motivator. The kids like the competition and they understand that they have to do a good job in order to compete and get anywhere. It really makes them work harder. In fact, when they get free time now, instead of asking for a book or a toy they indicate computer, which I think is good." Jan sees another aspect of socialization at the computer. "They love to show off that they've done an excellent job. They love to show what they can do."

Focusing on Individual Interests

All of the teachers and parents whom we talked to agreed that an important part of the child's success with technology is finding the reinforcement which is most motivating. Jerry and Leslie Lewis talked about their ten-year-old daughter who is making better progress with a communication program than with battery-operated toys. "Basically she's more interested

if she pushes something to indicate eat or drink. Maybe the toy movement just isn't interesting enough to her, but when food or something to drink is involved, it seems like that holds her interest more."

Denita makes modifications in her computer activities according to the child's needs. One child uses **First Words** (Laureate Learning Systems) as a motivator for identifying objects, while another needs sound cues. "I had one student who was just passive, but if you get excited, then he will get excited. And knowing that he pressed the switch to find the spoon on the screen really gets him excited. For the other student who is blind, you have to have some kind of noise along with the program you are using to get him going. You really do have to think of what their interests are."

Providing Information About the Child's Abilities

For the child with severe disabilities, the computer can provide valuable feedback to teachers and parents. Jerry Lewis has already realized this with his daughter. "An entirely different possible application of technology is not so much the direct instructional use, but the computer as a means of providing information to parents and professionals. I found that in working with her, you need to start with the basics and start at the beginning and not go too far above her capability."

For Jan Scott, the computer was a way to find out that a little boy she had taught for several years had a sense of humor. "He was able to communicate to us his basic needs plus he was full of humor and we discovered this right away. Lots of times he didn't like it when Jim (the programmer) would change his program without telling him. So when Jim came in, his first communication was 'see ya later' because he wanted Jim to leave."

Lynn Priepot sees this feedback aspect of technology as most important for working with her children. "We see potential sometimes, and we cannot figure out how to get to it. The children are so limited in language and ability to move that they cannot show us how much they know. We use the computer to help us get to some of those things."

In Summary

The benefits which technology offers for all children with disabilities can best be summed up in Jim Keefe's words, "A nice thing about a computer is that it can supply some of the intelligence to the person who may not have all that he needs in order to make something happen. We can bring the child to whatever level of understanding and awareness he has and bring the computer to that same circumstance to help fill in the gaps that the child does not know how to do. Between the two of them you will get (skills) you had never expected and could not get any other way."

Spring 1990

Integrating Technology into Birth to Three Programs

by Linda Robinson

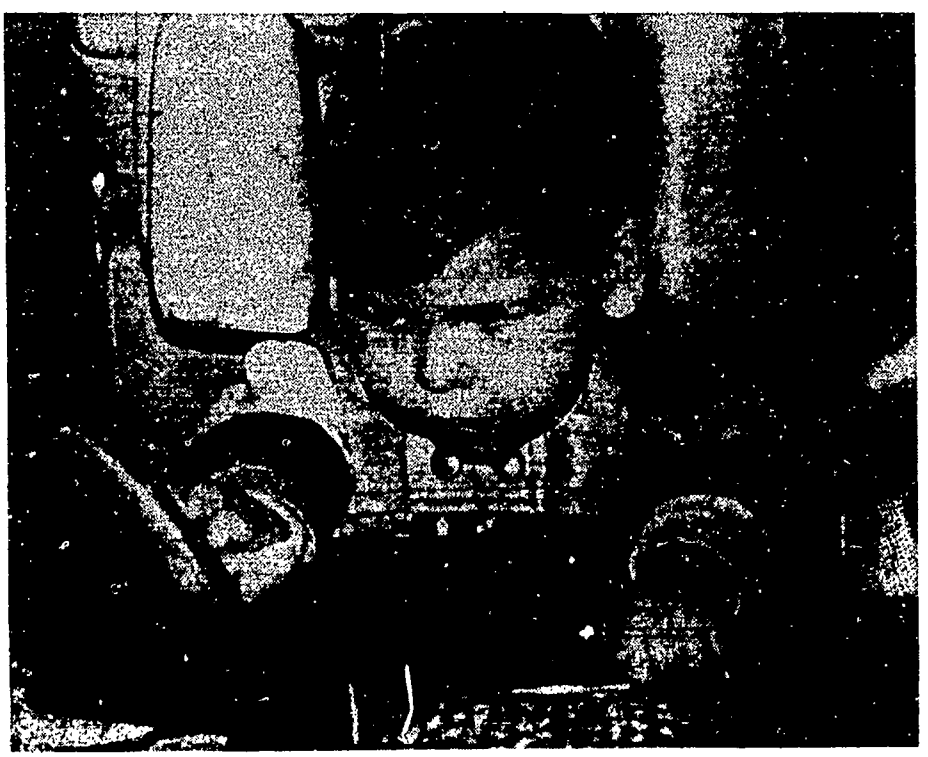
When thinking about integrating technology into a Birth to Three program, the first consideration is the child's goals. What goal will the computer be used to achieve? What skills will the computer be used to enhance? The computer can be used with any skills ranging from simple cause and effect to dressing skills. Parents and teachers have reported to us that the technology helps most with increasing attention span, providing or increasing communication, and helping those with physical disabilities to play with their friends in an equal manner.

Designing Activities

After the goals have been decided, the next consideration is the design of the activities. Think about the activities already being conducted in your program to reinforce the targeted goal. Combine the ideas you already are using with the many capabilities of technology. Use the exciting graphics, sound, animation, and concepts in the software and the unique capabilities of the equipment as the basis for the design of your activities.

For example, for a child with physical disabilities who needs to increase cognitive skills, but is unable to manipulate toys to learn his own causality of actions on them, a program, such as **Children's Switch Progressions**, could be used. With a switch, chosen to enhance the child's physical abilities, the child presses to see action on the monitor. The action may be a man walking across the screen to shoot off fireworks. The child controls with a switch press the continuation of the action, which is timed. With other programs the switch press controls a repeat of the same action. In this particular program the man moves closer toward a final goal each time the child presses the switch.

If the child does not understand his own causality of the action on the monitor and presses continuously, the Echo™ will tell him to "wait." As he uses this program he may begin to realize that he is in control of what the computer does and says. And through this type of activity he will begin to work toward his goal of developing cause/effect through a device which enhances his physical capabilities and allows him to be truly in control.



A switch connected to the computer or a battery operated toy allows a young child with disabilities an opportunity to understand causality.

Design off-computer activities to help reinforce the concepts at the computer. Using this same example of the fireworks, make a book from the different screens in the program by printing each picture with the FingerPrint card. Talk with the child and encourage him to talk about what is happening in each picture. The child could make his own fireworks also by using the Master Touch I program and the TouchWindow®. The "Touch Graphics" portion of the program provides a simple drawing medium. The child can touch and move his hand slightly on the TouchWindow® to make a

picture. In this way also you are reinforcing the cause and effect concept of pressing to control something.

With use of the touch tablets, such as the TouchWindow®, PowerPad™, or Muppet Learning Keys™, and a specialized software program for each one, customized overlays can be made. The software is **Talking TouchWindow, Talking PowerPad** or **Peek & Speak**, and **Talking Touch Pad** for each device respectively.

By making your own overlays, activities you do now in your program can be used at the computer with spoken words to encourage language development. If you have a name recognition activity during your center time, use the computer with one of the touch tablets with an overlay which contains photographs of the children in the room. Design an activity around each child pressing a photo and hearing the name spoken by the speech synthesizer. For children who can not talk, this is a good way to involve them in this group activity.

The speech synthesizer provides a stimulus for language development in children. Hearing the computer say their names or name objects may be more exciting than hearing an adult speak during a similar activity. In this way technology encourages language and provides a form of control for the children. Also concepts that the children have been learning in other ways have been reinforced at the computer.

A Birth to Three program in our area uses the **Wheels on the Bus** program with the PowerPad™ often. The Child Development Specialist has designed activities in different ways around the bus theme. During circle time as the children play with a plastic bus and figures, she talks about a bus and people who ride the bus. Then they pass the PowerPad™ around the group while each child takes a turn pressing a picture. The children are encouraged to sing the portion of the song and to imitate the gestures on the monitor. Children with physical disabilities may be assisted in pressing by a peer or an adult.

Other activities include reading a book about a bus ride or painting a picture by running a plastic bus through paint and then moving it around on paper. Use the FingerPrint card to print pictures from the program and make these pictures into small cards, a book or a large poster. Many off-computer activities can then be designed around these materials.

Child Positioning and Placement of Equipment

Two factors which need to be considered when designing technology activities are the child's position and the placement of the equipment. For children with good trunk control, a child-sized chair at a small table is suitable because it allows the child to sit comfortably and independently. Determine appropriate positioning for a child with physical disabilities during an individual computer assessment. A number of variables will need to be decided at that time, including what input method will be best for the child.

Always place the computer and monitor at a comfortable eye level for the children and within easy reach. Remove extra devices or components of the computer system, such as the disk drives, and at times the keyboard, from the child's view. This will limit distractions for the child. Set the monitor on a table so that it can be viewed comfortably, and place peripherals, such as a switch or PowerPad™ in a stable position. This may mean using non-slip matting to hold the device in place. Make switch holders to keep a switch in a secure position and to hide distracting cords.

A touch tablet, such as the PowerPad™, can be used with a group of children as they are seated on the floor. The device is then held by the interventionist and passed among the children as they take their turn pressing a picture. Whatever device and application is used, arrange the equipment to best meet the child's needs.

No matter what the input method or software, activities can be designed to fit into your present curriculum. Be creative and never be afraid to use a device or a certain piece of software because it looks too hard for the children. Children and technology continue to be a unique match that generates many creative applications.

Tool Use

Technology can also be an exciting tool for early intervention personnel and families. Not only can it make correspondence and data management easier, but it can help make the design of newsletters, signs, posters, and decorations for your program fun and easy. With **PrintShop** you can make banners for your center, signs for special events, and even make T-shirt transfers from the graphics in the program. By using the graphic editor portion of the program you can design your own artwork to print on your banner, card, sign or T-shirt. (Printing the design for the T-shirt requires a heat transfer ribbon, preferably a color one.)

The possibilities of using the computer as a tool are almost endless. Take time to play with the technology and software for your own use. You'll find many creative applications and become more comfortable about using technology with the children.

Fall 1991

Living In The Future Now: Doing And Making Do

by Patti Hutinger

In spite of the attraction and importance of new technology, remember that we have to live in our world, in our place and time. That means we have to **use what we have** while we work to make things better. Although technology changes quickly, with new applications available almost daily, many pieces of older equipment will still be used in schools and agencies.

The Old. While you might like to have an Apple II GS, your IIe will do many of the things you need in the classroom and may hold up for a long time. You can make do with your IIe by adding memory and using upgraded software. Children can use a drawing program with the PowerPad™, the Touch Window™, or another input device. I can remember demonstrating the PowerPad™ to a group of teachers here in Macomb several years ago. Many of them told me that they would never, never have access to equipment like that. The next year, one of them stopped me in the hall. She said, "You know Patti, you told us about the PowerPad™ at that meeting—and I told you I'd never get one. Well, now I have one. What am I going to do with it?" The unique quickly becomes commonplace these days.

And the New. As I was writing this article, I received a call from a group in the east who have a grant to develop a speech-based drawing program for children from five to eight. Imagine being able to draw on the computer by using your voice—ten years ago those of us who were computer naive would never have believed that this could happen.

And, I've also just previewed a CD-ROM program, "The Manhole," touted as a fantasy exploration for children of all ages. And it is just that! Although it has inherent limitations (it's in black and white and also needs a MacIntosh Plus, SE, or II with 1 meg or more and an SCSI hard drive, plus an Apple CD-SC CD ROM drive or equivalent and HyperCard), it is one of the most exciting programs for children I've seen. Children of all ages can explore a fantasy world with realistic sound that exists underneath the manhole cover in the street. This world is peopled by rabbits, elephants in boats, a walrus who complains that there are so many children around that he can't take his naps, a roll-top desk that houses a keyboard with various instruments' sounds, a drawing pad and a group of orchestra instruments, a swimming pool that drains and fills, passageways, stairs, rooms and much more. With a click of the mouse you can zero in on a small part of the environment, a television screen for example, and take a closer look. With the television screen you can click to see what's playing on "tv." And you can choose your maneuvers in and out of rooms, up and down stairs, and outside.

Behind this program is complex pre-production planning, time to execute interesting graphics, and a great deal of thought about levels of specificity for exploring the details of the objects and animals in the environment. It demonstrates, I believe, some of the potential of technology in programs for young children. "The Manhole", ActiVision for the Macintosh is by Cyan Software.

Winter 1990

A Look at the Future of Education and Technology

by Patti Hutinger

Just when you thought you were comfortable using computers, when you could install and use the Adaptive Firmware Card™ and the PowerPad™, I'm here to tell you that it's just a beginning! There's more! MUCH MORE! But you knew that already. I have to keep reminding myself because what you can do with technology always surprises and intrigues me. Between being excited by new possibilities and overwhelmed by the knowledge that as educators we must become comfortable with these amazing new and exciting potentials, some days I walk around in a mind-boggled daze wondering how we're going to put it all together, knowing that we must.

In state after state, for several years I've told audiences that the technology we are using now will be primitive in five years. People nod their heads in agreement. As my friend Bob Kelly says, "If you're current today, you won't be tomorrow." We need to constantly update ourselves on technology advances through contacts with other people who are excited about applications in our field, by playing with the equipment and software, reading magazines and journals, going to conferences, and hounding vendors. Keeping up takes time, energy and curiosity, and friends of kindred minds.

At a video conference this summer I heard a keynote speaker tell videographers and television specialists that they should seek a new name—"media specialists." He made a strong case for not getting stuck in one medium. Learn to combine technologies, he said, "or you will be unemployed." He urged that video people learn to use computer technology. But computers are only one part of the technology deluge.

The truth of the matter is that we've moved into the information age at warp speed and are living through nothing less than a technological revolution. The technology we use today is already outdated. More sophisticated hardware and exciting applications are here but are usually unavailable to us because of costs, a situation that leads to a growing gap between education and the rest of society. We hear that industry is far ahead of education and this is true. Lewis Perelman of the Hudson Institute gave the keynote address at the **Excellence in Education** conference in June and pointed out that the technological revolution sweeping through the U.S. and world economies will completely transform the social role of learning and teaching, leaving "conventional classrooms as obsolete as livery stables and blacksmith shops."

In our office we've been so impressed with Perelman's presentation that we wanted to share parts of it with you together with some of our insights. What Perelman says about education applies to Special Education and to Early Childhood programs as well as the entire field. Think about applying his content to your field as you read.

Perelman, who studies the effects of the expansion of technology, said last summer, "Business-as-usual policies and even reforms will lead to a growing gap between the technology of the school and the technology of the rest of the world..."

Outside of the schools, we are already combining technologies and accessing information in ways that our grandparents would find unbelievable—computers with videodiscs, computer driven media shows (think about those rides and displays at Epcot center), electronic data bases, an 800 phone number to check your electronic mail on BITNET.

Perelman noted that discussions of "educational technology" often focus on instructional computers, indicating that "just as the automobile was only the symbol of a host of technological and industrial innovations that changed the economic and social fabric of the twentieth-century world, the computer is only one star in a complex constellation of new technologies for and about learning that promises radical social change in the twenty-first century—which for public education has already arrived: The class of the year 2000 is in your schools today."

Perelman's estimate of the new teaching systems which will extend learning beyond what we normally think of as instruction (whether or not he meant applications for young children with disabilities) is both interesting and sobering reading:

The impact of evolving . . . technology on teaching is to increase greatly the productivity of a process that costs the U.S. economy over $300 billion annually, that employs at least nine and perhaps 14 percent of the workforce, yet which is ever less responsive to key economic and social needs. Two decades of research show that even rather ordinary computer-assisted instruction (CAI) produces about 30 percent more learning in 40 percent less time and at 30 percent less cost than conventional classroom instruction. The widespread adoption of existing, already-proven instructional technology could at least double the cost-effectiveness of teaching—saving the economy up to $100 billion a year.

. . . even greater gains in teaching productivity are promised by the continuing rapid advances in computer power in combination with the expanding educational use of related information technologies such as interactive videodiscs,

compact discs, telecommunications networks, huge online databases, and sophisticated software using artificial intelligence. These swiftly progressing technologies are making automated instructional systems ever more effective. Their use is growing rapidly everywhere outside of schools—in military training, in business and industry, and even in the home.

On another topic, he noted, "Some educators worry that the very strength of computerized instructional systems . . . will isolate students and undermine "socialization." But the truth is just the opposite. Studies of CAI show, according to Perelman, that in reality, it increases interaction among students and between students and teachers." This supports our observations during our years of using computer technology in preschool classrooms; we too have found that young children engage in cooperative social interaction when they work on the computer. Operating a robot, in varied scenarios, produces a wide range of cooperative behavior and sophisticated communication among children.

Education must be brought into the technology age faster and in a more pervasive fashion. President Bush's budget targets more money for education, together with research and development. Last summer Perelman noted that against the backdrop of the learning revolution brought about by technology, the solution to the problem of educational reform is not to resurrect the 'excellent schools' of some bygone golden age. Rather, he says: *The problem is that conventional schools are being deluged by a tidal wave of technological obsolescence.... The ongoing revolution in learning technology is totally out of the control of the public education bureaucracy. It is happening everywhere in our economy outside the public schools. The only question is whether the education system will catch up or fall ever further behind."*

Most classrooms are technologically little different from those of the nineteenth century.

Perelman cites rather frightening figures related to the economics of education:

. . . our largest and most costly information industry, has the worst and most regressive productivity record of any major sector of our economy. The Congressional Office of Technology Assessment found that education is the second most labor-intensive industry, with labor accounting for 93 percent of its production costs. At the same time, the education sector has the lowest level of capital investment of any industry—only about $1,000 per worker compared with an average for all U.S. business of about $50,000 per worker. And education has by far the lowest level of investment in research and development—spending a hundred times less than the average for the entire U.S. economy and 80 times less than the average American business .

While there are many examples of what seem to be meaningful changes and improvements in public education in the past several years, according to Perelman, when compared to the rapid and accelerating pace of change in all other social and economic sectors, the schools are falling backward at an alarming rate.

One of the outcomes of this growing technology gap, states Perelman, is "a widening equity gap between haves and have-nots. Because ...technology is ever more available in the workplace, the home, and the rest of the environment outside the schools, families with money and opportunity . . . will get access to high-tech learning regardless of what policies public education pursues . . . Down this path, in the next decade we will find that public schools have become a technological and intellectual ghetto for a predominantly poor, disadvantaged, and minority population.

The only alternative to this gloomy scenario Perelman contends is a sweeping restructuring of the entire education system: *The needed technological transformation of education will not be attained by simply throwing more computers and videodiscs into conventional classrooms. Rather, the organization, management, human resources, and curriculum as well as technical tools of education all need to be revamped and reassembled to fit a twenty-first-century economy.*

He believes that three simple and basic policies are needed to restructure public education. First, he advocates the introduction of choice and competition to the public education system. Second, the conventional methodology and philosophy of education must be comprehensively replaced with a system structured around mastery or competency-based instruction. Perelman insists, "We have known for decades that the failure to learn is technically unnecessary. Now it has become economically intolerable. The United States simply cannot afford to waste 80 percent of its human resources through an education system that makes most students fail so that a few can be labeled as 'excellent'." Third, he points out that we need to "abolish the cult of academic credentialism" if we want benefits of universal, competency-based instruction. Instead, we need "a national system of competency-based employment."

The public education system cannot carry out, by itself, the structural changes in policy that govern the education economy. Professional educators who choose empowerment rather than obsolescence need to help enlighten business and civic leaders about the kinds of reform that can really make a difference. Instead of fostering the belief that educators see the solution to every problem only as "more money," educators must reveal "one of America's best-kept secrets—that the great majority of public school professionals have all the imagination, talent, and courage needed to rise to the challenge of change."

Perelman gives us credit for being able to meet "the challenge of change." That's nice to know. Beyond that, as we see children who are unable to communicate verbally do so with technology applications, we know that these changes

Look Ma, No Mouse!!

Making McGee Programs Enjoyable For Those Who Cannot Use a Mouse

by Carol Schneider

If you are a regular subscriber to **ACTTion News,** you know how much we love the McGee software (**McGee, Katie's Farm, McGee at the Fun Fair).** However, the McGee programs are activated by clicking a mouse, and all too often, a child with physical disabilities has a difficult time using a mouse. If your classroom has access to an Adaptive Firmware Card™ ($520.00) and a Unicorn Board ($350.00) or switch, a set up can be made to provide a child access to the McGee programs. (See **Building ACTTive Futures,** Severe Disabilities Section). Also programs such as **MatchBox Keyboard Cover** ($85.00), **AFC Access TouchWindow®** ($150.00), and **Mousing Around** ($99.95) in conjunction with the Adaptive Firmware Card™, would provide easy access to the McGee programs for the child with physical disabilities. But, not all classrooms have the luxury of owning and using an Adaptive Firmware Card™.

If purchasing an AFC and other adaptive peripherals for your classroom is out of the question at this time, you can still provide your students with severe disabilities opportunities to explore with McGee by creating a book of McGee pictures so that the child is only required to point to a choice in the book rather than to operate a mouse.

Using the **FingerPrint GSi** ($94.95), a push button screen dump by Thirdware Computer Products, you can capture any image from the screen of the computer and print it out on your printer at the touch of a button. You can rotate, enlarge, crop, print billboards, or use any of the other options to enhance your images and position them on the page. If you have a color ribbon in your ImageWriter II printer, the screen dump will also allow you to print in color.

So, instead of using an Adaptive Firmware Card™ for a child to make choices, create a McGee Book by using a screen dump. Boot any one of the McGee programs. From each frame of the program, push the screen dump button to freeze each frame, make necessary adjustments, and print the screen using a color ribbon. The software program **McGee** will have six frames to print. After each frame is printed out, cut off the black color that surrounds each icon on the bottom of the picture. On light colored paper, paste each section of the picture (similar to what's on the monitor), allowing space between icons. Hopefully, this will make it easier for the child to see and touch.

Laminate each frame for durability and punch two or three holes at the top of the page. Use yarn or thread to tie the pages together, allowing enough leeway so you can turn the pages easily.

When the child approaches the computer center, the monitor should be at his eye level. Boot a McGee program to correspond with the McGee book you created. Talk about the sound and graphics of the software program. Show the child how the graphics in the book correspond to the graphics on the monitor. Instead of using the mouse to indicate his choice, the child will be able to indicate a choice by using the McGee book. As the facilitator, you will use the mouse and click on the child's choice.

This simple, inexpensive adaptation allows children with disabilities to participate in three exciting software programs for young children. If you have not purchased any of the McGee programs because you knew that the children you work with could not use a mouse and that the adaptive peripherals needed were not in your budget, wait no longer.

Spring 1991

Flap
Cut out

Flap
Cut out

Parent Workshop Project

by Karen Lawson

First Place Winner in Broderbund's The New Print Shop Classroom Creativity Contest

If you're looking for a great new idea to use in a workshop, try this sure-fire winner developed by ACTT staff for a parent workshop in our Head Start computer project. Not only did it fill the need of supplying Christmas boxes for gifts, it also won first place in the individual competition of **Broderbund's Classroom Creativity Contest.** All you need is **The New Print Shop** or **Print Shop IIGS,** an ImageWriter™ II printer, a four-color ribbon, and card stock.

To make a gift box, begin by making the lid. First select **Sign** from the menu; then select **Design Your Own.** Choose a background, border, and one or two graphics. Arrange the graphics in a frame with a larger graphic in the center of the sign. Add text where desired. You are ready to print your sign onto the cardstock. The pattern* on this page shows you approximately where to fold the edges of the sign to make a box. Cut out a "V" shaped notch as indicated on the pattern; then tape or glue the flaps to the inside of the box. For a box with deeper sides, adjust the folds closer to the center of the box. This will reduce the length and width of the finished box. Fold a second piece of cardstock to make a plain box bottom. You may also print a box bottom that matches or coordinates with the top. These boxes are much sturdier and look nicer if laminated with clear contact paper or laminating film.

After you have completed your first gift box, you may want to experiment with the size to make smaller boxes to hold tiny treasures. In the **Print** menu, under **Set Print Options,** set the reduction to whatever size you wish. Just remember the setting because, if you print a coordinating bottom, it must also be printed with the same reduction of size.

Whether you create your own graphics or use standard ones found in **Print Shop,** let your imagination soar. Print the first part of a favorite or seasonal joke on the box lid...'I told Santa you were good this year.' Then print the punch line on the inside of the bottom of the box...'and he said, "Ho! Ho! Ho!"' Personalize the box with the recipient's name, a special message, or a meaningful poem. The box may become a special keepsake of its own.

The beauty of **Print Shop** is its flexibility. With this program you will be able to print a coordinating greeting card using the sar e background and graphic as you used for the gift box. With **Print Shop Companion** you can make matching envelopes, too.

Reduce the size of the greeting card and envelope (selected in **Set Print Options**) to make a gift card. Most importantly, you'll find **Print Shop** is a great program to use to introduce families to the computer in an interesting, challenging way.

Summer 1991

Cut out
Flap

*Please note: This pattern is not an exact pattern. The folds and cuts indicated are approximate.

Cut out
Flap

Preparing the Computer Environment

The child's degree of success in developing skills on the computer depends to a large extent on the learning environment. Among other things, the learning environment includes the area the computer occupies in the room, the child's position at the equipment, the method of input the child uses for the computer, and the teaching strategies implemented.

The information which follows is taken from a chapter in **Building ACTTive Futures: ACTT's Curriculum Guide to Young Children and Technology**. The chapter is divided into three sections: birth to three, three to five, and severe disabilities. In upcoming issues of **ACTTion News,** we will be reprinting portions of each section.

The Computer Station

Whether your students will be using an Apple IIe or IIGS, a Macintosh LC or an IBM, there are certain additional pieces of equipment which can greatly improve the effectiveness of the computer station. The following list is certainly not inclusive, but serves as a good starting point.

1. **Computer cart on wheels:** For most children who use wheelchairs, a "standard" computer cart can be used to provide eye level placement for the monitor since many have adjusting table and shelf height. Depending on the size of the wheelchair, the top shelf of the cart may need to be removed entirely.
2. **Smaller table with chair:** Ambulatory children may need a different size table for appropriate computer/monitor placement. Their feet should touch the floor comfortably when they are using the computer. If the keyboard is not used, an input device and the monitor may be placed on the table without the keyboard to reduce extra stimuli.
3. **Surge protector:** A surge protector will protect your expensive computer equipment from damage caused by electrical surges.
4. **Power strip:** Power strips provide additional outlets. Some power strips also protect the equipment from electrical surges.
5. **Disk storage box:** A twenty-five to fifty disk storage box will provide adequate space for software which can be organized a number of ways within the file depending on the computer expertise of the staff. Disks may be arranged according to which children use them. This way, the staff can simply look for a child's name, select the program, and use it with little assistance. If the staff is fairly new to computer use with children, put a "cheat sheet" in the software box with the program which includes a list of the peripherals required, an outline of the instructions for use, and specific teaching instructions or applications for each individual child. You could also reduce pictures of the input devices and the keyboard on the photocopy machine and copy them on a full sheet adhesive label. Cut out the appropriate pictures and use them as icons on the disk envelope. If the keyboard is used, color appropriate keys on the keyboard icon which operate the program.
6. **Dot Matrix Printer:** Since most dot matrix printers print both graphics and text, teachers and children will both find many uses for the printer. The ImageWriter II is capable of printing in color, an important feature for printing children's art work. Children using augmentative communication programs can write and print out short notes to family members. Teachers can write IEP's, design calendars and newsletters, and use the computer for other record keeping tasks. Record keeping software with a hard copy print out option can provide useful documentation for measuring skill mastery.
7. **Various Adaptive Plugs and Jacks:** Some simple circuit devices to consider for classroom use are: 1) a switch extender (a length of wire to allow a child with physical disabilities to reach the interface box with relative ease), 2) double plugs to one jack adaptor (allows the child to operate two devices with a single switch press), and 3) double jacks to one plug (allows two children to operate the same toy or computer program).
8. **Switch Interface:** Several companies make switch interface boxes which enable single switch users to use the computer without the keyboard. Note that the software must also be written specifically for single switch use or operate with the Open/Closed Apple keys (on the Apple IIGS, the Open Apple/Option keys). An Adaptive Firmware Card™, versatile for single switch access, may be a consideration if most of the children in the classroom are single switch users.
9. **Clamps, tape, or other securing devices:** The keyboard, switch or other input device should be placed in a secure manner, be stable, and not hamper or distract the child from his objective.

The Child: Birth to Three

Environment plays an important role in the outcome of a curriculum activity for the very young child with special needs. Factors which can affect his/her level of response include switch type and placement, body position, location of the monitor or toy, room lighting, acoustics, and distractions. Input from parents and support professionals, such as physical therapists, vision and hearing specialists, occupational therapists, speech and language specialists, and physicians is essential in the consideration of environmental factors.

Child Positioning

The position of the child's body and the placement of the equipment are the two most critical factors affecting the level and duration of the child's response. Without proper positioning and placement, children are unable to initiate control over any aspect of their environment. Early sensory perception and cognitive development are affected by the child's position. Input from a physical therapist is essential in determining whether the child needs to be placed prone over a roll on the floor, in a chair, or in another position. Infants and toddlers have a strong need for stability and predictability in their environments. The consistency, comfort, and stability of their positions should allow them to concentrate on the activity.

Switch Determination

Determining the appropriate switch type is also an important factor to consider in conjunction with body positioning. To determine the type of switch the child can control with the greatest ease, begin by examining the child's present physical abilities for the most reliable body movements. Because switches vary in design and effort needed to activate them, the child's most reliable movements will be deciding factors as the choice for a switch (ribbon, leaf, tread, plate, or blow, for example) is made. Another factor to consider is the child's current concept of cause and effect. During initial stages of cognitive development, a switch which is activated by the least amount of pressure will help the child begin to realize his/her own role in causing the result.

Placement of Equipment

During initial switch activities with toys, present the switch in a position accessible to the child. When focusing on a single auditory stimulus—music, for example—it may be desirable to place the source of the sound out of the child's visual field, so that he/she concentrates only on the switch. When the switch is pressed, an auditory response is heard without any visual distraction. Choosing what to present in the child's immediate environment depends on his/her ability to focus on varying amounts of stimuli. For instance, if it is appropriate to present a moving toy to the child, the toy should stay within the child's visual field so that he/she does not lose track of it and become frustrated.

The switch should be held firmly in place (easily accessible to the child but not activated by the child in his "resting" position). It should not move (shift) when activated by the child.

When using single switch software, present only the monitor and switch in the immediate environment. Because young children love color and colorful software is exciting and attention-grabbing, a color monitor is more effective for them. With a long video cord for the monitor and an extension connection for the switch, the monitor and switch can be moved to a separate area from the keyboard, the disk drives and the computer. By seeing only the monitor and switch, the child more readily associates the switch press to the response on the monitor and is not confused by such factors as the "reading" light on the disk drive.

This same principle also applies when other peripherals are the focus of the activity. When using the PowerPad,™ present only it and the monitor to the child. In a small group activity, center the pad on a low table within reach of all the children with the monitor placed toward the back of the table. Or consider seating the children on the floor and placing the monitor on the floor or on a low table nearby. The PowerPad™ can be passed among the children.

Monitor placement is an important factor whether a switch or the keyboard is being used for a computer activity. The monitor should be placed at a comfortable eye level for the child. If he/she is required to hold his/her head back to look up at the monitor, he/she will tire quickly and will not be able to perform optimally. When an activity is conducted with a small group of children, consider the height of the monitor in relation to the children's eye level and place equipment so children can concentrate on the activity rather than on their discomfort caused by improper body positioning or equipment placement.

Limiting Room Distractions

Keep the room setting for any activity as familiar and natural as possible. If you are conducting home visits, the parent should help you choose an appropriate location in the home which can be consistently used for the child's activities.

It is easy to overlook details like background noises, so if the focus of the activity is auditory stimulus received from a tape recorder, toy, or software program, pay particular attention to the noises in the home. The young child may have difficulty focusing on the source of the sound if he is receiving constant noise from the environment. Even though sounds from a radio or television seem to be a natural part of the environment, overlooked in setting up an activity for the child, these same sounds compete with the auditory stimulus of the activity. When sessions are conducted in a large room, such as a church or community center basement, at a center-based program, poor acoustics contribute to noise distractions. It may be difficult for a child to determine the source of the sound when it appears to be surrounding him in a large room. Placing dividers in the room so that the immediate environment is more confined may help him to concentrate on the sensory component of the activity.

When the activity centers on a visual stimulus, consider the amount of visual distractions in the child's immediate environment. To determine what the child is able to see at a certain level, place yourself at the same level as the child. Darken the room slightly on a sunny day by closing the curtains to help the child focus on a lighted toy or to reduce glare on the monitor.

Summary

Obtaining information from the parents and support professionals who work with the child helps ensure an effective environmental design. Consider the child's position, most reliable body movements, resting position, physical abilities, sensory awareness, and level of cognitive development. The parents and professionals who know the child can provide you with information that would take hours of personal observation to gain.

Keep toys, switches, and other equipment in the visual field to a minimum to avoid confusing the child, place equipment with the comfort of the child in mind, and use switches that are easy for the child to operate. Always use a color monitor with a young child since it holds the child's attention more effectively than a monochrome monitor.

Integrating these environmental factors will determine the degree to which a child is able to respond, and controlling these "built in's" will have a great impact on the child's ability to succeed. Through continuous assessment of the child's physical and mental capabilities and of environmental factors, you can provide progressive opportunities to help the child achieve developmental skills.

Summer 1992

Software Review

Public Domain & Shareware Copy Programs Offer a Lot for a Little

by Kim Apfelbach

No doubt about it — whenever we see the words PUBLIC DOMAIN or SHAREWARE at a conference or in a catalog, we go nuts! For those schools and special agencies where money runs tight, the acquisition of public domain and shareware programs is a cost-effective means of adding alternative software to educational software libraries. Project ACTT, having analyzed hundreds of public domain games, utilities, educational and business programs over the years, has found that sometimes the most under-emphasized programs are the most helpful and useful.

Public Domain is defined as software that is not copyrighted and is donated to the general public by its author. While the software itself is free, distribution is not. Distribution charges vary from organization to organization. **Shareware** is defined as software that is copyrighted, with the author granting the user the right to utilize the program for a stipulated fee or a donation after a certain number of uses. These fees can range anywhere from $5 to $30 per program.

Copy programs, as unglamorous as they sound, are extremely useful to those schools and agencies where teachers and personnel share computers, software, and peripherals on a continual basis. Copy programs allow back-up copies of unprotected disks to be made — a feature which relieves any teachers from the headache of swapping software time after time and which promotes smart computing habits. Commercial copy programs, such as Apple/IBM compatible **Copy II Plus** (Central Point Software, Inc.), are available for approximately $50; however, there are a few public domain/shareware copy programs available to complement any software library for little or no cost. **ZZ Copy, Photonix** and **Diversi-COPY™** are three public domain/shareware programs which make backing-up a quick, painless task, whether you have one or two disk drives.

ZZ Copy is a 3.5" public domain program offering duplication for both Apple IIGS and Macintosh unprotected software. It offers an easy "in" to the outdated process of disk-in-disk-out copying by means of its Fastcopy technique: insert an unformatted disk into the drive and watch **ZZ Copy** format, read and write to disk within a matter of minutes! Another great feature, mass production mode, is available which can write multiple copies to disk without having to re-read the original disk. Animated graphics and sound are cleverly utilized in addition to windows which hide icons and remarks: a simple click of the mouse is all that's needed to access any of **ZZ Copy**'s options. Documentation is available from the disk for viewing or printing — an added plus considering this is public domain!

PHOTONIX 1.46 is another 3.5" copy program for Apple IIGS and Macintosh software which takes advantage of their system capabilities with animation and sound. For a $20 shareware fee, **PHOTONIX** offers copying in "one pass" — formatting, reading, writing and verifying all in one timely process. Two added features are an ability to change incorrect interleave ratios when copying to the target disk and a virus detector which identifies infected bits on the original disk but

TITLE	SHARE WARE	PUBLIC DOMAIN	DISK SIZE	VIRUS DETECT	MASS MODE	APPLE IIc	APPLE IIe	APPLE IIGS	MAC
DIVERSI-COPY™	■		5.25 3.5		■	■	■	■	
PHOTONIX 1.46	■		3.5	■	■			■	■
ZZ COPY		■	3.5		■			■	■

fixes and verifies format to the copied disk. **PHOTONIX**, like **ZZ Copy**, offers a mass production mode and documentation on disk.

Diversi-COPY™ is the third program featured which offers copying capabilities for both 5.25" and 3.5" Apple IIc, Apple IIe, and Apple IIGS programs. **Diversi-COPY** may not be as graphically oriented as **ZZ Copy** and **PHOTONIX**, but it does offer visual and auditory cues to track copying progress. Capabilities also include formatting ProDOS, DOS 3.3, Pascal or CP/M disks. An updated version of **Diversi-COPY** along with a user support number is mailed upon payment of the $30 shareware fee.

Undoubtedly, there are more public domain and shareware copy programs available through Apple User Groups, bulletin boards, and catalogs; check with other teachers, school districts or agencies, too, for they may hold a wealth of resources at the simple expense of a disk.

Spring 1992

Survey of ACTT Sites Reveals Benefits of Technology Use

Since its beginning in 1983, Project ACTT has considered technology a valuable tool for young children with disabilities. Over the years, we have witnessed many changes technology has made in the lives of children, have seen its benefits first-hand, and have rejoiced with ACTT site staff when they share with us success stories about children's gains through technology. We recently wrote a proposal for outreach funding to continue our work of training families and early intervention personnel to use technology. In the course of gathering information for this proposal, we conducted surveys, interviewed teachers and families, and considered the impact that ACTT services and technology has had on those whom we serve.

For example, we discovered that during the last two and a half years we have given 56 presentations, 23 workshops, and trained personnel from 27 new replication sites. Those activities impacted 3,078 individuals who served a total of **46,849** children!

Personnel from 38 ACTT sites responded to a survey we sent them requesting information about their sites, ACTT services, and the impact of technology on the children they serve. The survey showed that children, their families, and the site staff themselves benefitted from technology use. What follows is a brief summary of comments from survey respondents.

Benefits to Children

Technology has provided benefits to many children enrolled in ACTT site programs. Survey respondents reported,

"It has provided added motivation for children and assisted in language development."

"Staff members are discovering skills that were hidden in the students."

"There has been a decrease in self-stimulating behaviors."

"It has helped children develop independence, communication, and the ability to make a choice."

"It provides another modality to use in infant stimulation."

"When used in a group, it helps develop appropriate social skills (turn taking, cooperation, and leadership)."

"Children open up to the computer and can use all senses."

"Children's vocalizations have increased in response to computer sounds."

"When given a choice of where they want to work, the majority of children choose the computer."

Many respondents related specific examples of children for whom technology has made a difference:

A child with cerebral palsy who has no use of her left arm and significantly delayed use of her right arm used an AbleNet switch and Echo to develop cause and effect, to improve hand-eye coordination, and to create opportunities for play that she didn't have before.

A child with Attention Deficit Hyperactivity Disorder has been able to focus his attention and stay seated at the computer for extended periods of time.

A child with Down syndrome used the Muppet Learning Keys™ to learn numbers and letters. She moved to a regular education kindergarten program and is now using **Writing to Read**.

A hearing impaired child aged 2 years, 11 months, showed more complex skills during her computer time and increasingly used appropriate signs, requested computer activities, and became interested in using the printer for hard copy.

A child with moderate cerebral palsy and limited hand control moved from using the PowerPad to the Unicorn Expanded Keyboard and then to a regular computer keyboard.

A non-verbal child conveyed his understanding of concepts (colors, shapes, sizes, positions) by means of the computer. Over a two year period, his receptive skills remained at an age appropriate level (as measured by the Peabody Vocabulary Test), and he was able to follow instructions more accurately.

Benefits to Families

Such examples, among others, help us realize that technology does make a difference in the lives of young children with disabilities. Families also report positively about their children's computer use, saying that it has motivated children to attend to learning activities and has helped them become aware of their children's strengths. Parents are happy that technology can provide a means for their children to play independently and do something they "could not normally do." One

site began documenting parent involvement in 1987. They have noticed an increase in parents who have observed and interacted with their children on the computer at the site. Other sites report that parents "love" the technology, that it has raised parents' interest and helped the site involve parents in the school.

Benefits to Sites and Personnel

In addition to its effective impact on children and families, technology has benefited sites' services. Sites report that technology has provided a means of assessing fine motor and visual development, expanded treatment options, provided alternatives to therapies using colorful, motivating media, and enhanced the educational curriculum. Some personnel feel computer use allowed teachers to observe a child's true cognitive ability by minimizing physical limitations and made the teaching of skills easier. Sites also reported that their use of technology enhanced their visibility in the community and increased their credibility both within their school system and with other professionals.

Summary

Project ACTT believes that technology is an effective tool for equalizing opportunities for children with disabilities, providing them with ways to learn, play, communicate, and interact with other people and objects around them. One of our goals is to provide quality technology training to those of you who work with children so you can implement what you have learned from us and help children develop to their highest potential. Results from our surveys, interviews, and follow-up conversations with staff who use the ACTT model reinforce for us the knowledge of technology's effectiveness.

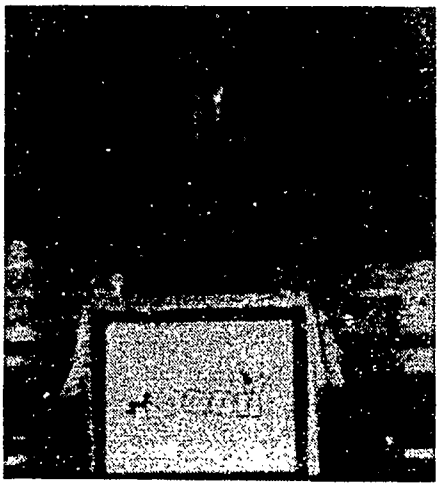
Spring 1992

Technology Considerations: What the Literature Says

by Linda Robinson

For both computer novices and experts, there are many factors to take into consideration when using technology with young children with disabilities. During Michael Rettig's session at the ACTT II Conference, many suggestions and research findings were shared with participants. The following article is written from information presented during the session.

The first consideration for any professional or parent working with computers is the actual functions of the machine itself. The easiest way to understand this is to take the lid off and become familiar with the inside parts and operations. Taking the top off, in a sense, unveils and lessens the mystique surrounding technology. After that is done, looking at the outside of the machine and its connections makes more sense. Since the computer industry is continually increasing the memory capability of the equipment, it is important to know how much storage capability each model of computer has and what the different size disks hold. Putting all of these bits of information together into an understanding of the operation of your computer system is the first step toward integration into the curriculum.



Michael Rettig, President of Exceptional Children's Software, speaks to ACTT II Conference participants about technology considerations for youngsters with disabilities.

The next consideration is how you are going to use the technology and for what goals. Are there proven practices? What do the experts say? We look to a review of the literature for the answers. But as Rettig pointed out there are very few researched articles in the area of early childhood special education technology. Although the actual number of articles has increased from 12 references in 1982 to 150 now, only 25% focus on children with disabilities and only 10% of the total number of references are researched articles.

Rettig centered his discussion of research findings around commonly asked questions in the field. Concerning how much time a child will spend on task at the computer, the average seems to be six minutes at a time at the preschool level, with some children going through as many as three programs in ten minutes. Out of this total time, there may only be one to two minutes that a child is actually "on task," spending the rest of the time opening and closing the disk drive doors or playing with the monitor buttons. There are factors which affect time on task, including the amount of teacher time involved and the type of software used. Rettig has found that children will spend more time at the computer when a teacher is involved in the activity and when the programs are experiential rather than drill and practice. Through our work with children in ACTT, we have found this to be true also.

Another common concern of preschool teachers and parents is the effect that technology has on social behaviors. After reviewing a variety of articles, Rettig concludes that social interaction at the computer is the same as at other activities. Social skills do seem to increase when the computer is used with groups of children. On the other hand, some younger children still do better when they are working at the computer alone. Although children show an enjoyment of computers, Niebor reported that in 1983 only 6% of the children in his study chose computers over blocks and dramatic play during free play time. Children are fascinated by computers initially, but later look at them as another object in the room. Today we can argue that this is the way we want children to regard technology, as another tool in the classroom.

In 1983, Colker wrote about computers and play, concluding that the computer needs to be looked at as another play thing. Versatility is the key to good use in early childhood. In ACTT we recommend using one program in many different ways and developing a variety of off-computer activities related to the concepts presented by the software. This helps children generalize skills learned at the computer. A realm of creative uses would result from early interventionists realizing the versatility of technology.

Another consideration is the age at which to introduce technology to children. Rettig pointed out that the meaningfulness of the activity will depend on the cognitive developmental level of the child. Concerning symbolic representation offered by the computer, Rettig found that children who do not need real objects for play activities, such as

those who can use a stick as a substitute for a play gun, will do better at the computer. More research is needed in this area and other areas of consideration to further substantiate preliminary findings.

At this time there seem to be more questions than answers in the literature about using technology with young children. For further reading on these considerations, Dr. Rettig has compiled an Early Childhood/Computer bibliography which is available for a nominal fee. If you are interested in receiving a copy, contact Dr. Michael Rettig, Department of Special Education, Fort Hays State University, Hays, Kansas 67601.

Spring 1991

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Niebor, R.A. (1983). A study of the effect of computers on the preschool environment. (ERIC ED no. 234 898)

Further Technology Considerations

by Linda Robinson

Once again we would like to share with you highlights from the March ACTT II Conference. This article continues the information presented in the last issue. It is based on the suggestions and research findings shared by Michael Rettig with participants at the conference. Dr. Rettig heads the Early Childhood Handicapped program at Ft. Hays State University. He is the president of Exceptional Children's Software and the developer of ten software programs for young children. Last issue's article focused on Rettig's comments concerning initial technology considerations. Once those preliminary factors are considered, then our attention turns to the specifics of computer applications, including software, input devices and developmental skills involved.

When early childhood professionals and families begin to design computer activities, the type of software to be used becomes a major component for consideration. The guidelines for selecting software will depend on your goal for using technology with the child. Many articles have been written during the past several years on how to evaluate software. In 1987, Lindsey found the following considerations to be most important. First, the program should be self-pacing. Second, it should offer flexible branching. Third, the program should provide immediate reinforcement and reward. Last, it should have multisensory modality. All of these considerations are good; however, they may not all apply to the children in your program. You may not need software to be self-pacing or offer flexible branching if you are conducting a language activity around the screens in **Stickybear Opposites.** In that case, the child controls the change of pictures and you may encourage him to talk about a particular one for as long as he wants.

Rettig took into consideration the early childhood population when he presented the factors he thinks are most important to software evaluation. Programs should be interacting and non-threatening; they should provide feedback and control the amount of feedback given. For example, Rettig's **Color Find** provides a happy face as a positive reinforcement for finding the correct color. The teacher or parent sets the amount of time for the face to appear on the monitor. This allows flexibility in designing activities for different children. One child may need more reinforcement than another child.

ACTT's philosophy on software use is that it is the way you use a software program that really matters. With creativity, you can take almost any program and design an activity with it for language, social or cognitive development for an individual child.

However, when working with children with severe disabilities, it is helpful to have software which allows you, in a sense, to customize activities. For example, the series of switch operated programs, such as **Make It Happen** or **Join the Circus**, developed by Don Johnston, allows the user to enter the child's name, verbally prompt the child, and set the level of difficulty. An increasing number of programs are becoming available with these options. Flexibility in controlling options is not an essential factor for software, but it certainly helps the user to meet individualized goals.

Software Resources

Where do you find out about different programs and their individual features? Rettig mentioned a few resources which include early childhood programs. High Scope publishes a software resource which lists and rates over 300 programs, 87% of which are written for the Apple computer. The software reflects a Piagetian philosophy with the best rated programs being **The Bald Headed Chicken** and **Rosie the Counting Rabbit**, from the Explore-A-Story series. This software is very good for promoting creative thinking in children. Children can rearrange or delete from the screen characters and objects in many different scenes. Words can be entered by the interventionist at any point, making this good software for experience stories. Children can then print out their stories to take home and share with family members.

Another software resource is Closing the Gap. The latest annual Resource Directory lists 140 early childhood programs, dealing with a range of skills from computer readiness to problem solving.

Project ACTT also has compiled a software resource, Software You Can Use in Early Childhood, which contains over 200 programs. A brief description of the program, intended age, necessary peripherals, price and ordering information are included. Software for use with a switch has been included in a separate section, since many times for young children this is the desired input method.

There are other resource guides for choosing software for early childhood. When selecting software, especially from a book which has included ratings, be aware that the audience of preschoolers who used the program may be different from the children you serve. For children with severe disabilities, operating a program independently may mean something entirely different from knowing appropriate keys to operate and selecting from a picture menu. For these children independence may also mean being able to operate the program with a switch or other appropriate input method.

Input devices

Rettig's discussion focused on four categories of input devices, keyboard, hand-held devices, expanded keyboards, and single switches.

Overall he pointed out that no one method of input is most effective, but he found the keyboard to be the least effective method. On the Apple IIe computer, there are 63 keys which are small and close together. For children, this means 63 choices for pressing, which may be overwhelming for some of them. Developers do not consider the preschool skills, since the majority of software being written, even today, is for keyboard input.

The hand-held devices, including game paddles, joystick, and mouse, require a lot of hand-eye coordination to operate. It especially takes some practice (as we adults have found out!) to use the mouse. Little research has been completed on the effectiveness of mouse input for preschool children with disabilities. ACTT has found children with mild developmental delays are able to operate the mouse and enjoy programs, such as **McGee and Katie's Farm.** Children with physical disabilities can use an expanded keyboard, such as the Unicorn, and the Adaptive Firmware Card™ to use the same software.

Expanded keyboards is the third category of devices and includes the PowerPad™, Muppet Learning Keys™, Koala Pad™, and TouchWindow®, as well as the Unicorn. Each device varies as to degree of sensitivity, software availability and adaptability. There is no doubt that Rettig's favorite is the TouchWindow®. A child has a natural inclination to touch what he is looking at; therefore, the TouchWindow® provides a method which is easy to activate and easy to understand for young children. ACTT shares Rettig's enthusiasm for this device, especially since it can be used by children with varying abilities in many different ways. Rettig has developed several programs for the TouchWindow®, including **Touch and Match**, and **Touch and See.** A new program dealing with prepositions was introduced at the session. Further work needs to be done on the design of the program before it is ready for distribution.

The fourth category of input devices is switches. There are a vast number of switches available which, when combined with a switch interface, can help a child with physical disabilities access software. Selecting the appropriate switch or other input device is a matter of assessing the child's reliable body movement and amount of pressure he can exert to activate any device. The large surface area of some of the expanded keyboards may be needed by some children, while others may need a switch positioning at their head to operate the computer. A technology assessment can provide the information needed to make choices on input method and software.

Skills

Rettig ended his session with some answers to an often asked question, "What skills do children need to operate the computer?" The motor skills which may be involved include range of motion, press and release, eye-hand coordination, reliable motor movement, and visual perceptual skills, such as visual tracking, figure ground and form discrimination. Cognitively, the children may need the following skills: cause and effect, attention span including sustained attention for time on task, and selective attention or the ability to discriminate between relevant and irrelevant, object permanence, means-end causality, imitation, one to one correspondence, intentional behavior, symbolic representation, reliable yes/no response and the ability to understand the task being presented. ACTT has found that in some cases the computer can be used to teach these skills. And of course, not all skills will be needed for all activities.

For children who will be using the computer and a switch to scan pictures or words to communicate, a separate set of skills are needed. Behrman identifies five skills needed to perform scanning: the ability to survey the options available, to note where the scanner is located, to visually track across the screen, to make decisions about when to press, and to initiate motor movement. Again the computer can help the child achieve the skills through simple switch software. Some of the children which ACTT has worked with have spent years learning these skills to prepare them for scanning in the future. To determine what skills a child needs to be learning, a technology assessment is needed. Then curriculum activities can be designed to help the child eventually learn to scan.

All decisions on software and input methods should be based on an assessment of the needs and interests of the children. The computer is only a piece of equipment in your program. It is the integration of all these factors into the child's individualized plan that makes the technology seem magical.

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Technology for the Visually Impaired

by Linda Robinson

During the ACTT I Conference, David Hauck, Director of the Computer Technology Center at the Illinois School for the Visually Impaired, conducted an ongoing equipment demonstration and talked about starting children on computer technology.

For the young child with a visual impairment, technology provides a tool to help communicate and achieve academic skills. At the age of 5 a child can start learning to read and use Braille with a Perkins Braille writer. Software, an Echo speech synthesizer, and an Apple II series computer can help with early reading, writing, and math skills. With **Talking Writer** (Cross Educational Software), a child learns keyboarding skills with alphabet and gamelike activities. The program provides verbal reinforcement from the Echo™ speech synthesizer combined with large print display on the monitor. For children who are learning spelling skills, the American Printing House for the Blind has developed a program, **Speaking Speller**, which helps children without vision learn and test skills. Through the use of Braille 'N Print, an electronic word processing device, and a standard Braille printer, a student can then print out his work. The Jacksonville Center considers these software programs and Braille devices a good way to introduce technology to the younger children.

During the ACTT I Conference, David Hauck demonstrates equipment and computer programs for the visually impaired to interested conference participants.

Teachers and families can use technology to make special picture books for their children which can be used to tell stories or as coloring books. Through the use of the PowerPad™ and **MicroIllustrator** (Dunamis), pictures are drawn and saved to disk. Braille images can then be produced with the help of the program, **Pixels** (Raised Dot Computing) and a Braille printer. The program takes stored graphic images, saved as ASCII text files, and dumps them to a Braille printer. The Jacksonville school has bound volumes of these printouts which are enjoyed in many different ways by the children.

Through the use of speech synthesis, Braille printers and devices, such as the Optacon, which helps in reading conventional print, persons with visual impairments can participate in all aspects of daily living. The young child who is using technology now to learn beginning reading skills may wake up to a sophisticated system with a modem reading the **USA Today** to him as an adult.

David Hauck feels that technology plays an important role throughout these children's entire lives. "It means independence, and an opportunity to compete with their sighted counterparts as students in an educational environment. It also means an opportunity for visually impaired people to compete in post secondary levels, vocational training programs and to have an opportunity for a real decent job."

There are several good resources for technology information for the visually impaired including:

Computer Technology Center
David Hauck, Director
Illinois School for the Visually Impaired
658 East State Street
Jacksonville, Illinois 62650
(217) 245-4101

American Federation for the Blind - New York
For information on their services and their address, contact David Hauck.

American Printing House for the Blind
Educational Research Division
1839 Frankfort Avenue
P.O. Box 6085
Louisville, KY 40206
502/895-2405

The Communicator
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Spring 1990

TouchWindow® Activities for the Visually Impaired

by Carol Schneider

When integrating computer technology for a young child with visual impairments, begin by considering the present goals and activities of the child. One common goal for a child with a visual impairment is the ability to distinguish between objects of differing shapes and textures. Activities using a computer and TouchWindow® can be developed to help the child reach that goal.

Talking TouchWindow (Edmark), **Talking With Your TouchWindow** (public domain), and **AFC Access: TouchWindow** (Don Johnston) are software programs that easily allow you to "program" the TouchWindow® to individualize an activity. The Echo™ Speech Synthesizer can be used with any of the three programs to prompt the child and to give verbal reinforcement during an activity.

If the child needs activities designed to teach tactile discrimination, you could design overlays using a clear transparency and such tactile materials as puffy paint, sand paper, duct tape, cotton balls, foam, yarn, wood, feathers, and various fabric textures (velvet, corduroy, wool, satin, denim). Begin simple by dividing the overlay into two sides with one tactile material, such as sand paper, on one side and another material, such as a piece of velvet fabric, on the other. Place a dot of puffy paint directly under or on (just be consistent) each to serve as the activation point for the TouchWindow®.

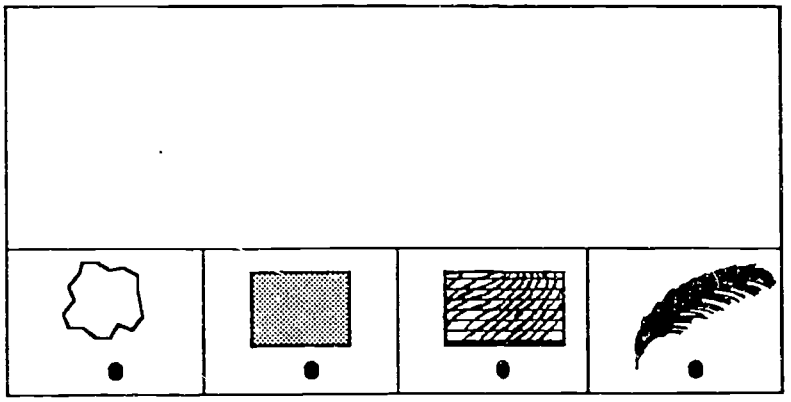
With **Talking TouchWindow** or **Talking with Your TouchWindow,** you can program the Echo to prompt the child to find a texture, "Which one feels soft?" "Which one feels scratchy?" and to respond to the child's choice. When the choice is correct, the Echo might say, "Good work!" or "You found it!" or "Right! Sand paper feels scratchy." If the choice is incorrect, the Echo might respond, "Let's try again. Which one feels scratchy?"

As the child becomes more accomplished in discriminating between textures, increase his/her choices on the overlay to three or four. This activity with choices helps prepare a child to use other programs. By feeling and pressing an activation point on the TouchWindow®, the child can explore options in programs such as **McGee**, Lawrence Productions' mouse-operated program that allows a child to help McGee explore his house early in the morning before his mother wakes up. This program can be adapted for use by a child with visual impairments. Use **AFC Access: TouchWindow**, the Adaptive Firmware Card™, and customized overlays.

First apply four small dots with puffy paint to the bottom of a clear transparency. Each dot will represent a McGee graphic icon and serve as an activation point for the child's choice. When the paint is dry, put the transparency on the TouchWindow®, boot **AFC Access: TouchWindow** and select **S.AssistGS.** Load the setup and boot **McGee.** Next place the TouchWindow® and the tactile overlay on the computer monitor for direct selection or place it on a table or the child's wheelchair tray. Let the child try selecting.

Adjust the TouchWindow® setting with Control-A-7 options (calibrating the TouchWindow®, change the time needed to hold your finger on the TouchWindow®, click length, and mouse adjust), if necessary. To send a mouse click, the child must hold his/her finger on the tactile dot in one place for a short time until she/he hears the click feedback. The child can then release his/her finger.

Using this first transparency with only the activation dots assists the child's under-



Make an overlay for the TouchWindow® like the one shown above by dividing the lower section into four parts. On each of the four parts put a dot of puffy paint to serve as the activation point. Place materials of different textures, such as a cotton ball, a piece of sandpaper, a block of wood, and a feather, in each part. The child can explore McGee's house with McGee by finding a texture and pressing the activation point.

standing of how the program is activated.

Once the child understands his/her control of the program, you can design overlays to encourage the development of other skills. Make an overlay with four different textures (sand paper, cotton, duct tape, etc.) applied to the bottom of the overlay to represent the four icons seen on the screen. Place a tactile dot directly on or under each texture to serve as the activation point. Combine the identification of textures with the movement of McGee through his house. Help the child problem-solve using the textures as a reference. For instance, "If you want to go downstairs, press the sandpaper."

This setup can also be used with other McGee adventures, **Katie's Farm** and **McGee at the Fun Fair**, both from Lawrence Productions. The exciting part of this technology is that the child who cannot use the mouse because s/he has no visual orientation to the monitor can use mouse-operated programs by simply touching the screen. The Adaptive Firmware Card and **AFC Access: TouchWindow** allows him/her to use McGee-like programs now and learn skills which will make more sophisticated programs accessible in the future.

As the facilitator, be creative and let your imagination go! These TouchWindow® activities are just a few computer activities that can reinforce skills for the child with visual impairments. Other peripherals such as the PowerPad™ can also be easily adapted with tactile overlays.

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