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Augmentative Communication News

November, 1990 Vol.3, No. 6

INSIDE THIS ISSUE . . .

UPFRONT

This issue focuses on the application of assistive technologies in classrooms with students of all ages.

Assistive technology[1] is defined as "any items, pieces of equipment, or product systems (whether acquired commercially off the shelf, modified, or customized) used to increase, maintain, or improve functional capabilities of individuals with disabilities."

For this issue, **classroom** is defined traditionally as a room on a campus where teachers instruct students in the presence of other students.

Note: Philosophically, classrooms may be defined as any place where individuals learn through instruction (e.g., home, community, school, travel, etc.). I like that, but it is too broad to deal with here!

Table I. *(page 3)* lists ten areas in which assistive technologies are currently being applied. For many learners, the use of assistive technology in classrooms is essential or they can neither benefit from their education, nor achieve any sort of independence. This issue highlights a growing challenge in AAC to *think beyond communication*.

In **Clinical News**, parents, researchers, teachers, and clinicians share issues and guidelines for implementing assistive technology. The **Equipment** section introduces concepts of stationary and portable work stations. In **For Consumers**, you'll find a list of books by *(or about)* individuals who experience severe problems communicating. The insights offered to readers about their life experiences are invaluable. **Governmental** discusses the impact of laws on the development and use of assistive technologies. Finally, **University/Research** highlights research at the

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Clinical News

Assistive technology in the classroom: Issues and guidelines

Assistive technologies enable people to communicate, receive instruction, learn, play, move about, eat, achieve, and be independent. Unfortunately, these often sophisticated technologies are becoming available at a time of dwindling resources in education. As a result, devices are often not perceived by school administrators, professionals, or families as the powerful tools they are. Rather, they are looked upon as "too expensive," "too hard to use," or "just one more thing" that will:

- a) take time away that no one has
- b) bring more people into the classroom
- c) cause problems that are not easily solved, and
- d) introduce goals that can not be accomplished.

Issues and Concerns

Among the topics raised by those interviewed were:

1. *Allocation of resources for hard and soft technologies.* A useful distinction can be made between **"hard" technology** *(i.e, equipment)* and **"soft" technology** *(i.e., intervention techniques and strategies, models of learning, man-machine interaction theories, and so on).*[2] Despite widespread agreement among practitioners that success depends on a ratio of 10 to 1 (soft to hard technologies), funds allocated by schools *(and other agencies)* are likely to be earmarked for hard technologies. Instructional technologies *(and people who know how to use them)*, so desperately needed to implement devices, are rarely forthcoming.

Note: AAC manufacturers who support their equipment with training are an obvious exception.

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Augmentative Communication News

UPFRONT (continued from page 1)

CALL Center in Edinburgh, Scotland. I am indebted to all those interviewed *(see Resources page 8)* for sharing their creative ideas, perceptions, frustrations, and experiences. Thank you!

If you signed up for 1990 CEUs, your copy of the test is included in this issue. Follow the instructions carefully and return the test and CEU forms before January 31st to receive credit for 1990.

Gary Poock, your publisher, and I wish you the happiest of holidays. It's a special time to celebrate the present, reflect on the past, and get excited about the future. We sincerely thank you for your support and look forward to serving you in 1991 and beyond. If you have any questions, suggestions or topics you would like to see covered, let us know *on the HOTLINE (408) 649-3050*. Salud, Le Chiam, Skol, Cheers to you and your families!

Sarah Blackstone, Author

Clinical News (cont. from page 1)

2. *The right people.* To implement assistive technology, different types of support personnel are needed:

- Person(s) (e.g., clinician, teacher) with in-depth knowledge of devices/strategies and the time and ability to instruct others to implement effectively.
- Person(s) (e.g., instructional assistant) to support students throughout the day so they can actively and independently participate in activities.
- Person(s) (e.g., engineer, technology specialist) to provide technical support on the spot when problems occur.

(Note: this may be one person, but typically is several different people.)

3. *Funding.* Funding for assistive technology (hard and soft) has been, and probably will always be a "challenge." Budgets everywhere are tightening. That's reality. A common scenario, I'm afraid, is time, energy, and money are wasted by agencies, organizations, professionals, and families "fighting" about who will buy what. Students rarely benefit from these squabbles.

Today, however, educational systems around the world are buying communication aids, assistive listening devices, computers, access technologies for some students. Some are also providing the support required to turn devices into tools. Communities and schools working together find they can raise funds, involve local charities, and build collaborative community projects. Secondary benefits of collaboration are heightened community awareness, increased acceptance of assistive technology, and improved attitudes toward students with disabilities.

4. *Owner/loanership of devices.* Many schools that purchase assistive devices for students, permit them to take equipment home after school, on weekends, and over the summer. Unfortunately this is not always true. To expand the Monday-Friday, 9:00 to 3:00 communicator/learner/ambulator's access to technology, try these approaches:

- a) Ask administrators why students can check out a band instrument or take pencils and books home, and must leave their communication device at school.
- b) Emphasize the fact that communication aids, computers, etc. are instructional tools, not extracurricular/luxury items.
- c) Suggest developing a loan equipment protocol that must be signed by families and the student before equipment goes home. This document can specify what equipment is being loaned, describe how it is to be maintained, how it will be transported, and who will assume responsibility if when it breaks down.

Note: Assistive technology does not "fit" well into everyone's home or life style. If families do not wish to have devices at home, so be it!

5. *Making it work*. Successful approaches to implementing assistive technology exist in all types of classrooms (e.g., private schools, regular education classes in neighborhood schools, special education classrooms in public school programs, college classes, etc.) Ingredients for success include: administrative support, highly trained and committed professionals, access to equipment, interagency cooperation, ongoing monitoring of each student's program, and internal and external program evaluation.

6. *Time.* Therapists with large caseloads and teachers with insufficient help are barriers to assistive technology implementation. Even experienced teachers, who are comfortable with and believe in assistive technology but who are limited in time and support, become frustrated. Some take action!

- A month after school began, a teacher in the middle of a "budget crunch" sent a nice note home to parents (with copies to the Principal and Director of Special Education) saying she would try to accomplish stated educational goals, but was pessimistic. Much of her time, she explained, was spent toileting, feeding, and positioning, rather than teaching her multi-handicapped students.

7. *The curriculum.* The purpose of education is to prepare children to become independent, responsible adults. The curriculum serves as the map. "The curriculum is not a syllabus," or the result of learning, but embodies the "whole learning experience."[3] Assistive technology is not a curriculum. Technology provides a tool box and gives students a means to a variety of ends (communication, instruction, mobility, learning, control, self care). Assistive technology teams approach classroom teachers with the attitude and philosophy "we are here to support the student's active participation in his or her curriculum." Underlying this approach is the important assumption that a curriculum exists. In my experience, this is often not the case. The "curriculum" in special education is often a hodge podge of goals developed by speech-language pathology, occupational and physical therapy, adaptive physical education, computer resource teacher, augmentative communication team, etc. Without a map, we inevitably get lost!

Guidelines for Success

1. Don't introduce lots of assistive technology at once. *(cont. on pg. 4)*

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University & Research

CALL Centre University of Edinburgh, Scotland

Work at the CALL *Centre (Communication Aids for Learners in Lothian)* began in 1979. The Centre is part of the Godfrey Thompson Research Unit in the Education Department and a major AAC center in the United Kingdom. Core funding is from the Scottish Education Department within the Scottish Office, with research projects funded by a number of different agencies. Research staff include:

Phil Odor, computing and education; **Sally Millar**, speech therapist; **Paul Nisbet**, technical development officer; **Stuart Aitken**, psychologist; **Ian Craig**, electrical engineer.

This article highlights their ongoing interests in student modeling, learning, instructional strategies, and curricular considerations, as they affect communication, instruction, mobility, vision, environmental control and access technologies. The group refers to their projects as "action research," meaning although a product often results, projects are designed to help people along the way. With attention to both theory and practice, they are asking exciting questions about how individuals with special needs learn and how best to use technology to facilitate learning, development, and independence. Their papers are challenging and reflect the group's commitment to "posing questions, without trying to impose solutions." Three major strands permeate their projects.

1. **Computer-based learning.** What kind of tool is the computer? The staff are interested in computer-based learning. However, they do not find computer-aided instruction (programs in which the machine determines the path) a useful application for most learners with disabilities. Instead of concentrating on deficits and rote learning, their idea of computer-based learning is to find domains in which an individual with disabilities can succeed. They are exploring:

- Revelatory techniques (simulations, exploration of "micro-worlds"
- Conjectural techniques (strives to allow learners to build their own words, and
- Emancipational techniques (allowing the computer to strip away barriers to learning e.g., writing aids).[9]

Microworlds are a major tool and intervention platform. Created mainly in Logo, Smalltalk and Hypercard, they allow learners to access "multiple intelligences" described by Gardner (drawing, visual perception, spoken language, written language, music, logical/math, body and kinesthetic, social).[13]

2. **Student modeling.** How can the growth of learners with special needs be facilitated? What role can assistive technology play? One challenging project currently is exploring how blind children perceive the world.

COMPUTER-BASED RAISED DIAGRAM AND PICTURE DESIGN FOR YOUNG VISUALLY HANDICAPPED CHILDREN. The objective of this joint project with Moray House College of Education in Edinburgh is to find principled ways to allow blind children to emerge into the sighted world by using insights gained from their alterative representations. Researchers are asking questions about what images best represent what is in the child's head for objects, distances, textures, weight, movement, relationships, etc. They are creating diagrams and tactile pictures using the Macintosh and SuperPaint by developing a toolkit of legible patterns, shapes, lines and symbols, and using a public domain Braille Font, coupled with the Minolta system. It produces raised diagrams on micro-pearl papers. Adaptations, duplicating and sharing among staff and teachers is now easy. Project staff are just beginning to investigate the process of how children transfer mental signifiers into 2 dimensional forms. They are in a "question asking" and "formulation stage" and welcome comments from others with similar interests.

3. **Modular toolkits.** The development of modular tools and common user interfaces in special education is seen as a means to reduce the complexity problems learners confront in using communication aids, computers, and wheelchairs. Modular toolkits can allow devices to be as simple or as complex as the user requires. However, instead of linking components together in a more or less linear fashion, the CALL Centre's work has evolved toward the development of packages that take a functional, interactive rather than a straight engineering approach. Two examples follow:

THE SMART WHEELCHAIR. Motives behind the design of the CALL Centre Smart Wheelchair are:

- 1) provide a stimulating environment for electric wheelchair users,
- 2) encourage socials skills i.e., exploration, assertiveness, and self-determination
- 3) integrate augmentative tools needed for mobility, communication, access, and special learning needs into one system.

Designed as a collection of tools that can keep the user out of trouble while extending their range of useful activities, the degree of responsibility apportioned between the chair and user is adaptable. Modules include the:

- System (bump detector, line follower, position in a room, way to avoid objects).
- User (choice of input: Go/stop only, switches, proportional steerers, scanned matrix, or communication devices).
- Observer (reports the chair's perceptions and actions back to the user via a speech synthesizer or visual display, and can ask the user for advice and incorporate the user's reply into its planning and actions. Observer modules enable dialogues between the user and system).

Currently, 12 chairs are being built for a field test in local schools. Staff are setting up and testing implementation strategies. Future modifications may include an overt bidirectional chair to person communication, as well as the vehicle that has more traditional and unidirectional interpersonal and person to external machine communication.

AN ASSESSMENT TOOLKIT FOR COMMUNICATION AND LEARNING IMPAIRMENT. Components will include input systems, vocabulary handling aids (thesauri, spell checkers, prestored phrases, word/symbol banks, & predictors); output systems (screen display of text, icons, pictographs, animations, speech, music, and control of external devices), and feedback mechanisms. This project is still evolving. However, the major goal now is to develop a Toolkit that takes into account the processes of interaction. This work is connected to the international feasibility study (COMPIC) being undertaken within the Nordic Council to look into the next generation of communication aids.

In addition to their work as an AAC Center and their research projects, the Call Centre has an active training, material development and information dissemination program run by **Liz Sutherland** and **Amy Toss**. Articles used in preparing this issue are listed in the references.2,3,14 These and other publications can be obtained by contacting the CALL Centre, University of Edinburgh, 4 Buccleuch Place, Edinburgh, Scotland EH8 9LW Tel. 031 667 1011 ext 6713 or FAX 031 667 7938 Attn: Phil Odor.

Your Resources

Mary Anzelmo, Project Director, Technology in the Classroom. American Speech-Language Hearing Association, 10801 Rockville Pike, Rockville, MD. 20852

Peggy Barker, Rehab. Engineer, Children's Hospital, Rehabilitation Engineering Center, 520 Sand Hill Rd., Palo Alto, CA 94304

Nancy Barnes, Speech/language specialist, Plavan School, 9675 Warner, Fountain Valley, CA 92708.

Berkeley Augmentative Communication Team, 2134 Martin Luther King Jr. Way, Berkeley, CA 94704. Staff, families, and student ideas are constantly expanding my ideas on this topic.

David Beukelman, Professor, Barkley Memorial Center, Universtiy of Nebraska, Lincoln, NE 68588-0731

Andrea and Douglas Braswell, 620 E. 13th Street, Apt. 5I, New York, NY 10009-3615

Charlene Butler, Ed.D., Special Education Teacher, Seattle Public Schools. 2143 N. Northlake Way, Seattle, WA 98103.

Marilyn Buzolich, Ph.D. Co-Founder/Co-Director, Bridge School, 545 Eucalyptus Ave., Hillsborough, CA 94010.

Cindy Cassatt-James, Director, Assistive Device Program, John F. Kennedy Institute, 700 Broadway, Baltimore, MD 21205.

Al Cook, Co-director, Assistive Device Center, 6000 J St., Sacramento, CA 95819

John Costello, Speech Path., Comm. Enhancement Clinic, Children's Hospital, 300 Longwood Avenue, Boston, MA 02115.

Kathryn Dawson, Technology Mainstreaming Coordinator, 37 Alberta Rd, Brookline, MA 02167.

John Effinger, AAC Specialist, Anchorage School Dist. Whaley Center, 2220 Nichols, Anchorage, AK 99508.

Carol Flexer, Assoc. Prof. of Audiology, Dept. of Communication Disorders, University of Akron, Akron, OH 44325-3001.

Susan Hough (speech-language pathologist), Kathy Taylor (teacher), Michelle Lubetsky (computer resource), Rehab. Institute of Pittsburgh, 3601 N. Northumberland Street, Pittsburgh, PA 15217.

Pat Mirenda, Assoc. Prof. Spec. Educ., Douglas College P.O. Box 2503, New Westminster, BC, Canada V3I 5B2. (note: returning to the Univ. of Nebraska in 1991)

Carolyn Musselwhite, AAC Consultant, 83 Keesler Rd., Asheville, NC 28805

Phil Odor, Researcher, CALL Centre, Univ. of Edinburgh, 4 Buccleauch Place, Edinburgh EH 89LW

Susan Procter, Occup. Therapy Consultant, 290 Ridge Road, Ben Lomond, CA 95005.

Linda Robinson & Letha Clark, Macomb Projects, College of Educ., W. Illinois Univ., 27 Horrabin Hall, Macomb, IL 61455.

Elaine Trefler, Assistive Technology Consultant, 129 Aldershot Blvd., Winnepeg, Mannitoba, Canada R3P 0E2

AVAILABLE MATERIALS

Macomb Projects. Write for list of materials for preschool classrooms. College of Educ., 27 Horrabin Hall, Western Illinois University, Macomb, IL 61455.

Rehabilitation Institute of Pittsburgh. Staff have 3 strategies to share: 1. Playboards: Making play more functional for students with physical disabilities; 2. Using the Thunderscan scanner to produce reading and communication materials; and 3. Computer-based group lesson plans in an AAC class. Send $1 with self-addressed stamped envelope to ACN, 1 Surf Way, #215, Monterey, CA 93940.

Irene Wortham Center. a) AFC Emerging Literacy Set up Disk ($20 + $2 handling). - 20 programs (e.g., Milliken story book, Tim the Cat, for Apple 2 w/ G-32 AFC) b) Game adaptations. $10. Irene Wortham Center, Attn: Caroline Musselwhite, P.O. Box 5655, Asheville, NC 28813.

Center for Special Education Technology. Techology user in the classroom: I. Alternative keyboards II. Augmentative communication devices. Soon to be available, 1920 Assoc. Drive, Reston, VA 22091.

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