



DIRECTIONS

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Family-Centered Decision Making in Assistive Technology

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Part 3

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PROVIDING AT INFORMATION TO FAMILIES AND PROFESSIONALS

As teams seek to involve parents in a more substantive and meaningful way in planning AT for students with disabilities, a significant potential obstacle is the difference in background information and preparation about AT that these two types of team members bring to the meeting. While some school professionals come to these meetings with at least some basic information about AT, that may not be the case for other educators, or for parents (Angelo, 1997; Parette, Brotherson, Hoge, et al., 1996). Similarly, not all professionals may be sensitive to the influence that a family's cultural background may have on the family's AT decisions.

One promising possibility for providing parents as well as professionals with AT information is through computer-based information sources. By the mid 1990s almost one third of U.S. households were reported to have personal computers (Charp, 1996), a figure that has continued to increase substantially since that time. The increasingly ubiquitous home computer provides several avenues for distributing information, including the Internet and CD-ROMs.

The Internet

With the expanding popular use of the Internet for disseminating information (e.g., websites, listservs, discussion groups), many AT professionals have sought to make more information accessible to parents via technology. For example, simply entering the keywords assistive technology planning in the Yahoo search engine generates a list of more than 4,700 entries throughout the Internet.

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Press Release

Enabling Devices - Toys for Special Children

**Hastings-On-Hudson, N. Y.
February 20, 2001**

Enabling Devices & Toys for Special Children is pleased to introduce a number of exciting toys and devices for the start of the New Year! We have created five unique switches to make learning or simply playing, more stimulating. We have added to our new line of Take N' Talks and created a miniature version of our popular Shooting Stars. Some of our products have been designed for school environments and others aid in communication for individuals with profound challenges.

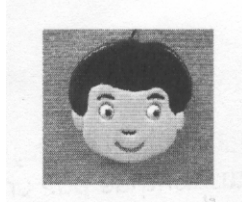
The **Eye-Talk** opens up a whole new world of social communication skills. It is a great alternative for children and adults who want and need to communicate but whose speech and physical limitations make it difficult. The Eye-Talk helps to make eye-gaze communication more accurate and understandable.

The **Slant Board** is perfect for assisting with handwriting training while the slant encourages proper wrist position. In addition, use of this slant board promotes better functional postural position and stability.

Race into action with our cool new **Racecar switch!** This switch comes with colorful stickers that you and your child can put on together! Just cut them out and stick them on!

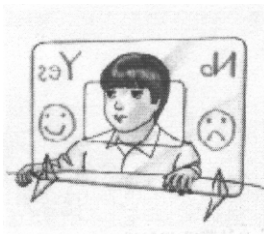
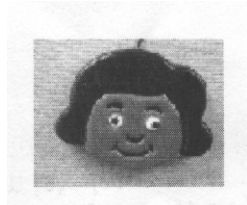
Meet our new friends! We are delighted to introduce our new line of "people switches". Please say "Hi" to

Terrific Tim, Pretty Patty, Super Sally and Jolly Jay! These switches will bring fun and enthusiasm into learning or playing!



Terrific Tim

Super Sally



Eye-Talk

We are thrilled to offer the "Place" option with our entire series of Take N' Talks. This means that each device plays a message when placing an item or removing an item from the light sensitive compartments. All Take N' Talks come with FREE Individualized Education Plans (IEP) complete with a suggested activities list. Elizabeth Meyer, a pediatric rehabilitation professional, creates all IEP's for Enabling Devices.

For a copy of our FREE brochure or catalog featuring the above products any many more, call Rachel Duclos at 800-832-8697 or fax 914-479-1369. Visit our website at:

www.enablingdevices.com §

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Decision-Making contined from page 1

However, a sole reliance on the Internet as a computer-based information source on AT for parents or professionals is ill advised. By its very nature, information located on the Internet is unstructured and nonsystematic, if not actually chaotic. Unlike information published in professional journals, little or no editorial control exists over content provided on websites, yielding data of wildly varying quality. Thus Internet browsers may well encounter information that is misleading, self serving, or even potentially harmful, depending on the particular site.

There are a variety of efforts to provide more useful AT information through the Internet for families for students with disabilities, including such options as listservs and discussion groups focusing on AT (Carvin, 2000). Though well-intentioned, these avenues may contain inadvertent obstacles as families seek to participate meaningfully or access information. For example, a listserv approach to discussing Quality Indicators for AT (QIAT) has been ongoing for over two years (University of Kentucky, 2000). The QIAT listserv has grown from a subscription list of 2 to its present list of around 200. Included in the QIAT group are people with varying perspectives, experiences, and responsibilities related to the development and provision of quality assistive technology services (J. Zabala, personal communication, February 16, 2000). QIAT has grown well beyond its original intent of being a feedback loop for the development of quality indicators. It now functions as a collaborative learning community, widening its focus to include

discussions with students, families, and other professionals concerning the actual delivery of quality AT services in field settings. These discussions are important, given that policies and procedures will evolve from such discussions, and will be implemented by school systems nationwide. However, until recently participants in QIAT discussions regarding AT decision-making processes primarily have been professionals. The issue here is not one of overt intent to exclude families, as participating professionals have noted in QIAT discussions the absolute necessity for family involvement. However, for whatever reason(s), parents have not been as actively involved in these Internet-based information activities as might be desired. Other vehicles for dissemination of AT information must be sought.

Computer-based interactive multimedia

Interactive computer-based multimedia is an especially promising avenue for providing information to AT team members, including families and professionals. No longer just a buzz word, multimedia is becoming increasingly firmly entrenched in the lives of more and more people. The combination of sound, images, video, and interactivity with the audience has become a key ingredient of entertainment, business, and education. Multimedia incorporates graphic design, video techniques, print media, story writing, and audio production into a comprehensive and powerful communication package. Rudimentary multimedia packages in the form of movies, television, and video tapes have been used for many years to expose audiences to places,

events, and experience that they would not be able to otherwise encounter. Enhancing multimedia's traditional provision of images and sounds, computer-based multimedia technologies add a unique interactive capability, allowing the user to control and individualize the interactive learning experience. Providing for individualized customizing of the experience, computer-based multimedia technologies can allow the user to select narration in alternative languages, select a personal onscreen guide, repeat an instructional segment, or skip irrelevant material. There have been rapid developments in the tools for creating high-quality multimedia so that today effective programs can be created with only a modest investment in hardware and software. Appropriately designed computer-based instructional materials can reduce instructional time up to 50 percent (Ambron & Hooper, 1990), and can be substantially more effective and less costly than conventional instruction (Department of Defense, 1990).

Interactive multimedia programs can be distributed in a wide variety of formats. Currently, the most common format is CD-ROM, which can hold up to 650 megabytes of information on a disk. The next generation of CDs emerging is the digital versatile disk (DVD) which holds from 4 to 8 times as much as a CD-ROM. Multimedia programs can also be distributed and played over a network or via the Internet. When interactive multimedia programs are designed, a number of user-related factors should be considered. These include user characteristics, preferences, literacy, point of access, and available technology resources.

Continued on page 6

19th Annual Conference

Registration

The registration fee for the three-day conference (October 18-20) is \$330 if received by Closing The Gap on or before September 6, 2001. Registrations received on or before June 30, 2001 qualify for a discounted early registration fee of \$295. Groups of ten or more from the same organization may deduct \$15 for each registration (all registrations must be received by Closing The Gap at the same time). Presenters may register for \$175. Exhibitors may register for \$175. Late registration fee (for anyone) is \$360 if received by Closing The Gap after September 6, 2001 and before October 4, 2001. All registrations (for anyone) received after October 4, 2001 will be \$410.

All-day preconference workshops are scheduled for October 16-17, 2001 at a cost of \$195 a day.

Most workshops qualify for academic graduate credit through Hamline University,

St. Paul, Minnesota. An outside assignment is required for all academic credits in addition to workshop attendance. The fee for each one-day workshop is \$195. Academic credit fee, if desired, is \$85 for .67 semester credit (1 quarter credit) per one-day workshop.

All who register by October 4, 2001 will receive confirmation by mail.

A certificate of attendance is available upon request.

Cancellations must be received in writing by Closing The Gap on or before October 1, 2001. All cancellations are subject to a \$50 cancellation handling fee. No refunds after October 1, 2001. Unpaid balances are due in full.

The official Closing The Gap Conference Directory will be given to registrants at the conference site; many of the conference details will be posted on Closing The Gap's Web site.

Conference Headquarters

The Radisson South Hotel, 7800 Normandale Blvd., Bloomington, Minnesota and the adjacent Hotel Sofitel, 5601 W. 78th St., Bloomington, Minnesota are the official hotels of the conference. All conference activities are held at these two hotels located just 10 minutes west of the Minneapolis-St. Paul International Airport. Limo, taxi, and mobility assistance services are available.

Further Details

A second conference brochure detailing the preconference workshops, over 150 presentations, and the commercial exhibits will be available on or about August 1, 2001. Details will also be posted at www.closingthegap.com.

Contact Information

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Web site <www.closingthegap.com>

2001 CONFERENCE REGISTRATION FORM

Please photocopy this form for additional registrations

First name _____ Last name _____

Address (home / work - please circle which) _____

City _____ State / Country _____ Zip / Postal code _____

Daytime phone _____ Fax _____ E-mail _____

Employer _____ Occupation _____

SPECIAL SERVICES (are reserved for persons with special needs only and must be requested by September 6, 2001)

Adapted program (check one only): MS-DOS text file Macintosh text file Braille directory

Sign interpreter (must indicate specific interpreter needs including time frame): _____

REGISTRATION FEE FOR CONFERENCE - OCTOBER 18-20, 2001

(Conference registration includes Commercial Exhibits Preview - Wednesday, October 17th, 6:30 pm - 8:30 pm)

\$ _____ Registration received on or before June 30, 2001 - \$295.00

\$ _____ Registration received on or before September 6, 2001 - \$330.00

\$ _____ Group - Groups of ten or more from the same organization may deduct \$15.00 for each registration. (All group registrations must be received by Closing The Gap at the same time.) Group Discount is not applicable after September 6, 2001.

\$ _____ Presenter - \$175.00 (Presentation title: _____)

\$ _____ Exhibitor - \$175.00 (Company name and booth number: _____)
(Exhibitor must be a scheduled representative for the booth to receive the discounted fee.)

\$ _____ Registration (for anyone) received on or before October 4, 2001 - \$360.00

\$ _____ Registration (for anyone) received after October 4, 2001 - \$410.00

PRECONFERENCE WORKSHOPS AND RELATED FEES

\$ _____ Preconference Workshops (October 16 and 17, 2001) - \$195.00 each one-day workshop

(Preconference workshop registration includes Commercial Exhibits Preview - Wednesday, October 17th, 6:30 pm - 8:30 pm)

Please indicate Preconference Workshop choices by number.

Tuesday, October 16th 1st choice PC- _____ 2nd choice PC- _____

Wednesday, October 17th 1st choice PC- _____ 2nd choice PC- _____

Registration prior to arrival at the conference is required for preconference workshops.

\$ _____ Materials Fee (Note: The materials fee equals the cost of the materials provided.)

PC-1 has an additional \$15.00 fee for materials.

PC-14 has an additional \$10.00 fee for materials.

PC-9 has an additional \$20.00 fee for materials.

PC-16 has an additional \$30.00 fee for materials.

PC-10 has an additional \$25.00 fee for materials.

PC-20 has an additional \$30.00 fee for materials.

PC-11 has an additional \$20.00 fee for materials.

PC-22 has an additional \$10.00 fee for materials.

\$ _____ Academic Credit Fee - \$85.00 for .67 semester credit (1 quarter credit) per one-day, preconference workshop.

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\$ _____ **TOTAL AMOUNT PAID**

My check # _____ for \$ _____ is enclosed.

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Cancellations must be received in writing by Closing The Gap on or before October 1, 2001. All cancellations are subject to a \$50 cancellation handling fee. No refunds after October 1, 2001. Unpaid balances are due in full.

Mail or fax form with payment or purchase order to: Closing The Gap, P.O. Box 68, Henderson, MN 56044; Fax 507-248-3810

Or register on-line at: www.closingthegap.com

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Decision-Making continued from page 3

Such individual characteristics as age, sex, gender, disability race, education, culture, and socioeconomic status also influence the effectiveness of multimedia educational programs. It is unlikely that any single program can be designed to meet the needs of all potential users. However, given the costs associated with developing, distributing, and using these programs, it is crucial to reach as much of the potential audience as possible. For example, one way to enhance the engagement of a diverse group of users with the multimedia program is to assure that any examples used in the program include individuals who represent the spectrum of age, race, gender, culture, and socioeconomic background of the target audience.

An important feature of successful interactive multimedia programs is the users' ability to tailor the presentation of information to meet individual preferences, needs, and desires. Features that can be included to accommodate individual preferences are (a) a selection of topics to study, (b) a selection of electronic guides, (c) user-controlled pacing of information, and (d) the availability of additional or more detailed information on a topic. Other important program features include the ability to (a) review previous topics, (b) select the language, (c) easily skip or bypass components such as introductory instructions and credits, (d) easily backtrack or return to a previous point in the program, and importantly, (e) quit or exit the program at any time.

Point of access and technology resources available to the potential users are also important user-related factors in developing and providing

interactive multimedia programs. Point of access refers to where the user will interact with the program, while technology resources refers to the equipment required to access or playback the program. Multimedia developers must consider the playback resources the intended users currently have, and what resources are likely to be available in the near future. Potential resources include the computer equipment, operating system software, run-time software, and network connectivity. For parents who may not have computers in the home, providing family access to computers at school is one way to begin bridging the so-called digital divide, or the gap between those families with access to computer resources and those without.

In order to enhance the overall effectiveness of multimedia programs for users with widely differing backgrounds, interests, learning styles, abilities, and disabilities, developers must incorporate the concepts of universal design into their programs (Brewer, Dardailler, & Vanderheiden, 1998; Center for Applied Special Technology, 1998a; Center for Universal Design, 2000, VanBiervliet, 1994). For educational programs, universal design can be defined as providing (a) multiple representations of content, (b) multiple options for expression and control, and (c) multiple options for engagement and motivation (Center for Applied Special Technology, 1998b). Providing multiple representations of content means providing essential information in redundant formats, such as an auditory narration that is accompanied by text and images.

Providing options for expression and control involves providing various

options for users to test their knowledge. For example, in addition to traditional multiple choice questions, the program could include questions presented in a challenging game format, or an interactive exploration of three-dimensional objects. Multiple options for engagement includes providing content in multiple learning styles, such as guided and exploratory styles, and providing multiple levels of depth or detail on topics. In addition, multimedia applications should be designed so that individuals who cannot easily use a mouse or keyboard can use alternative input devices with minimum fatigue and minimal errors. The overall design of the visual appearance, and interactivity of the multimedia application impacts the user's motivation and engagement levels. Although multimedia programs that utilize universal design approaches can and should be visually attractive, function should always take precedence over form.

For example, some designers create small, multi-function navigation controls. These controls may be visually attractive; however, larger fixed buttons might be easier to use and require less fine motor control to operate. A final issue regarding access in interactive multimedia that is overlooked in much of the universal design literature concerns the use of color. Eight percent to 12% of all European American males have some form of color vision deficiency or color blindness. When designing applications, developers should avoid color as the sole cue, instead using colors only in combination with some other visual feature, such as size or font style change (Oakley, n.d.; Wilson, 1996). Similarly, multimedia developers should avoid giving instructions such as Click

on the red button that refer to objects only by color.

The Interactive CD-ROM

Much of what has been discussed in this article so far was taken into consideration when a new interactive multimedia educational tool to be used by professionals, families, students and others involved in AAC decision-making from a family perspective was developed (VanBiervliet & Parette, 1999). This CD-ROM, entitled Families, Cultures, and AAC, focuses on family and cultural issues related to Augmentative and Alternative Communication (AAC) devices, though it has broader implications for a wide range of AT devices. The program's content is based on AAC planning and implementation processes from a family perspective, with particular emphasis on cultural sensitivity. The content of the

CD-ROM was derived from a knowledge base created using both families (i.e., an Advisory Board, focus groups, and structured interviews) and professionals (i.e., expert panel, focus groups). The program features 1.5 hours of video segments, and includes 16 interactive learning games, dozens of web site links, a multimedia glossary on AAC, and a variety of printable documents. Topics included in the program include: (a) Introduction to Families, Cultures, and AAC, (b) Respecting Family Values, (c) Team Collaboration, (d) Helping Families Use AAC, (e) Family Views, (f) Funding AAC, and (g) Working with Interpreters. Some of the features that have been built into *Families, Cultures and AAC* are shown in Figure 1. The program incorporates the aforementioned universal design features, including (a) information redundancy, (b) multiple strategies for expression and control, and (c)

multiple options for engagement and motivation. In addition, the program also provides for bilingual access. Narration and essential program features are provided in English and Spanish. The CD-ROM contains video vignettes of family members from five different cultural groups who express their thoughts and feelings about aspects of the AT decision-making process. Interactive games are also available to provide alternative means of accessing information and to reinforce concepts and content presented. The CD is designed to be used as (a) a tutor, (b) a decision-making tool when working on teams, (c) a learning game, (d) an encyclopedia on AAC, and (e) a research tool. The CD also includes research materials of interest to personnel in higher education and clinical settings. These include focus group transcripts, an AAC knowledge base, instruments used in collecting

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CONCLUSION

In light of the extraordinary new technologies and approaches in assistive technology that have emerged over the last few years, there is great optimism among professionals regarding the potential of these special services to enhance the lives of children with disabilities. However, families may exhibit less optimism, and perhaps with good reason. For example, a report by the National Council on Disability (2000) found that some schools in all 50 states were out of compliance with special education regulations to some degree. The report also noted that federal, state, and local procedures designed to insure that students with disabilities receive a free, appropriate, public education in the least restrictive environment were ineffective and without force. Although AT was not specifically addressed in the report, the findings do have important lessons for the family members and professionals involved in the selection and delivery of AT (Lance, 2000).

The ultimate question that presents itself to professionals is this: How can professionals most effectively address the AT needs of a particular child and her or his family at a particular point in time? As is so often the case in special education, while the question is simple, its resolution is complex. Professionals must be cautious not to let the excitement of new AT-related hardware and software mask significant deficits in the present AT planning and delivery system.

Perhaps the most significant difficulty at present is that parents do not play a larger role in the AT planning process. This is likely due to a combination of lack of information about AT on the part of parents, and lack of sensitivity to cultural and family factors on the part of AT professionals. Such computer-based multimedia information sources as the CD-ROM, *Families, Cultures, and AAC*, that are designed to provide AT information and cultural sensitivity to both families and professionals hold great promise for effectively responding to both these challenges in the new century. §

Figures and references for this article may be obtained by contacting DreammsforKids, Inc.

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