DOCUMENT RESUME

ED 339 154 EC 300 764

AUTHOR	Schwartz, Arthur
TITLE	The Role of the Speech Therapist in Acquisition and Use. Tech Use Guides: Using Computer Technology.
INSTITUTION	Council for Exceptional Children, Reston, VA. Center for Special Education Technology.
SPONS AGENCY	Special Education Programs (ED/OSERS), Washington, DC.
PUB DATE	Nov 90
CONTRACT	300-87-0115
NOTE	5p.; For other tech use guides, see ED 324 842-850 and EC 300 758-769.
PUB TYPE	Guides - Non-Classroom Use (055)
EDRS PRICE	MF01/PC01 Plus Postage.
DESCRIPTORS	Computer Software; *Computer Uses in Education; Consultation Programs; Elementary Secondary Education; *Language Handicaps; Regular and Special Education Relationship; *Speech Handicaps; *Speech Therapy; *Staff Role; Teacher Role; Teaching Methods; Team Teaching; Teamwork; Technology; Therapists

ABSTRACT

As the consultation model of service delivery spreads, more and more speech and language clinicians are coming out of the therapy room and going into the classroom. Clinicians and classroom teachers can form technology partnerships as they collaborate to use microcomputer software to address the needs of children with speech and language disorders. This guide discusses several of the roles speech and language clinicians undertake as they: (1) use software as a context for communication; (2) adapt educational software; (3) integrate computer applications; (4) cue and prompt communication; (5) collaborate with teachers; (6) teach stimulation techniques; (7) serve as technical advisors; and (8) participate in software selection. The guide also examines the three stages of computer activities (precomputer, computer, and postcomputer) and the issue of whether the clinician or the student should operate the keyboard. A list of seven references and nine organizational, print, and software resources is included. (JDD)

Center for Special Education Technology

Tech Use Guide

Using Computer Technology

The Role of the Speech Therapist in Technology Acquisition and Use

The distance between the classroom and the therapy room dwindles when classroom teachers and speech and language clinicians collaborate to use microcomputer software to address the needs of children with speech and language disorders. In the process, significant **technology partnerships** are formed.

Technology applications in general, and educational software in particular, present a shared context in which academics and communication augment each other. The child receives additional exposure to subject matter, increased opportunities to master information, and more occasions to use speech to express understanding of the material presented in the computer program.

As the consultation model of service delivery spreads, more and more clinicians are coming out of the therapy room and going into the classroom. Within the classroom setting, clinicians are providing services to children, collaborating with classroom teachers to accentuate communication opportunities during instructional activities, and teaching teachers how to prompt speech and language performance.

The clinician's role expands from that of a provider of service to a consultant, technical advisor, and learner. This Tech Use Guide discusses several of the roles speech and language clinicians fill in: (a) using educational software for enhancing speech and language performance; (b) collaborating with classroom teachers and aides to use technology to enhance speech and language performance in the classroom; and (c) advising special education administrators when making decisions about acquisition of technology that could assist the communicative and academic performance of communicatively impaired children.

Using Software as a Context for Communication

Speech and language is enhanced when children focus on communicating about the content or operation of a computer program. Students need opportunities to stabilize or expand their articulation, fluency, voice, or language skills in a functional context. They need experience asking questions, commenting, listening, taking turns, and initiating communication. Using the same software in the classroom and therapy area provides that experience.

In 1986, Miller and Marriner advocated employing software as a catalyst to promote carry-over of communication. When children respond to questions or comments about the program, communication becomes the focus of the activity. Conversely, when the operation of the program is the focus, communicative interactions are minimized.

One example of adapting software to a language approach is the creation of a poster for an upcoming school event, project, or holiday. *Print Shop*® is one of several programs for designing posters, banners, and greeting cards. Easy to learn and simple to operate, it is more than a tool program—it is a context for communication. Questions such as "What do we want to say about litter?," "Should we put pictures with the text?," "Why do you like this style?," or "What happens if we put too many things here?" facilitate the communicative interactions that are so essential if students are to learn to use their speech and language appropriately outside the therapy situation.

Software is the means to an end; the end is to get the child to use language to direct, talk about, and comment. Often, if the teacher or clinician deliberately makes a mistake in selecting an option or entering text, an opportunity for problem solving and critical thinking is presented.

Adapting Educational Software

Educational software designed for language arts concepts such as analogies, cause and effect, or inferences is readily adaptable for therapy. Programs originally designed to provide drill and practice for reading comprehension become language comprehension programs when the items or instructions are read aloud to the child. Responding to questions or directions, the child uses his or her speech and language for academically-oriented material. In a group situation, the child with an articulation disorder focuses on his or her sounds in responding; the child with a voice problem would monitor and control pitch or loudness; and the child with a language impairment uses tense markers or other grammatical structures in his or her response.

Integrating Computer Applications

Speech and language clinicians have found that technology is as effective as more traditional approaches,

A Project of The Council for Exceptional Children
Funded by The Office of Special Education and Rehabilitative Services, U.S. Department of Education

and in many instances is more engaging than paper or pencil activities. Increasingly, efforts have focused on integrating computer applications into the curriculum as opposed to earlier efforts on supplementing or "adding on" to the curriculum. Software programs are educational tools; when they are used as part of the instructional process, they "fit in." Using a word processing program to construct and revise a story as part of a whole language approach fits more appropriately into speech and language therapy than allowing a child to play a computer game if he or she performed a series of activities acceptably.

The Three Stages of Computer Activities

The communicative value of educational software is accentuated when the program is tied to nontechnological activities. Cochran and Bull (1991) have modified teaching of writing strategies for use in speech or language. The three stages of an activity—precomputer, computer, and postcomputer—all share the same theme. Cochran and Bull have applied this format to language therapy. During the precomputer activity, they recommend that the clinician structure interactions to establish the activity as one requiring verbal interaction. An example of a precomputer activity for stimulating language comprehension or production is using the Mr. Potato Head® toy to teach concepts such as spatial relations (above/below, left/right) and body parts (eyes, nose, ears). In the precomputer phase, the clinician asks questions or responds to instructions from the children for selecting and positioning facial features.

The second stage, the computer activity, is similar in content to the precomputer activity but is in a computer format. For example, the *Facemaker* program enables students to construct a face as well as to animate some facial features such as eye blinking, smiling, or crying. A child working on a WH-question formation asks another child, "Where is the hat?" Another child learning spatial terms identifies where different facial features are to be placed. Using his or her newly improved speech sounds, a child with an articulation problem gives instructions for animating sequences of movements such as "Wiggle the nose after he blinks his eye." And the child with learning disabilities recalls the sequence of animation he or she observed.

The third stage, the postcomputer activity, prepares the child to use language skills in another setting. This activity is used to rehearse an assignment, particularly when it is possible to generate a printout from the activity. For example, a postcomputer activity might be a homework assignment to explain how a printout was created. Presenting questions such as "What are you going to tell your mom about how you made this card?" prepares the learner to use his or her communication outside the therapy setting.

Cuing and Prompting Communication

Speech and language clinicians consciously use cues and prompts to stimulate children to use speech and language. Depending upon the way a cue or prompt is worded, a child can be stimulated to follow directions or use speech and language for single word, phrase, or sentence replies. A choice prompt, "Is the animal on the chair or under the chair?," will stimulate a one-word response. A WH-question, "When do you wash the dishes?," is likely to be answered in a short phrase. Lastly, a prompt that asks "Why?" or "How?" is most likely to inspire the listener to respond in sentences or discourse. These techniques seem to be as effective for computers as for nontechnology materials in stimulating speech and language.

Opportunities for prodding communication may be missed if prompting and cuing techniques are not employed. The QCQ (Question, Comment, Question) technique has been developed to remind clinicians to cue and prompt verbal responding. Comments and questions are used to induce the child to comment about the contents of screen displays or to direct the operation of the program. Inexperienced computer users tend to become passive observers rather than active participants in a computer activity. The QCQ technique was developed to help remind clinicians to ask questions to prompt a child to talk. As an example, when using *Explore-a-Story: The Lima Bean Dream*, the clinician comments about the display (e.g., "That cow is walking across the field to go into the barn") or about the operation of the program (e.g., "How can we get the goats into the pen?"). The child responds in an utterance using the articulation, voice, fluency, or language pattern being developed. In turn, the clinician makes a comment on the child's utterance that may clarify or amplify what the child said (e.g., "Yes, the cow is eating some hay. She can also eat grass in the field."). The comment is immediately followed by another question (e.g., "What do you think the cow will do when the farmer opens the barn door?").

Controlling the Keyboard

Operating the keyboard is not necessarily consistent with activities designed to stimulate verbal responding or interactions. For many children, operating a computer keyboard helps them to develop a sense of independence, achievement, and confidence. When a child keyboards, program operation can become the focus rather than the context of the activity. There is little need for talking when using the correct keys is the focus of the activity.

Using speech and language to interact with others or to understand or express concepts is a challenge for children with speech and language problems. Sitting at a computer and responding to screen displays by entering responses on the keyboard might accentuate a child's reticence and awkwardness in communicative situations. Keyboarding can actually reinforce nonverbal behavior!

One alternative that is consistent with Miller and Marrinel s exhortation to use technology as a context is

for the clinician to operate the keyboard. The child's attention and efforts are then channeled toward descriptions of screen displays or toward the next steps of operating the program. When the clinician asks, "Why do you want me to move this object over here?," the child has more opportunities to use speech and language in a functional setting than if the child used the arrow keys to relocate the object on the screen.

Furthermore, when the clinician keyboards, there is an opportunity to deliberately make mistakes. This can be an occasion for a child to learn pragmatic skills about correcting others, giving instructions, explaining what is wrong, describing the correct response, and explaining a decision or recommendation.

Younger children or those with more severe problems who need opportunities to use speech and language to convey information or understand directions are not appropriate candidates for operating the keyboard. Older children, particularly those with residual language comprehension problems, can work on tutorial or simulation programs independently, operating the keyboard themselves, if the content has previously been introduced in class or therapy.

Collaborating with Teachers

Children who have speech and language impairments take their communication problems into the classroom with them. The vocabulary and grammar problems of these children clearly impact their academic success. Classroom instruction is augmented when educational software is used as a tool in speech and language therapy. Conversely, carry-over of newly emerging communication skills is enhanced when classroom teachers know how to use educational software to complement speech and language performance. Moore-Brown (1990) maintains that when clinicians know how academic subjects such as reading, writing, math, or science are taught, they are better able to assist classroom teachers when speech or language problems interfere with a child's progress in these areas. As technology partners, teachers and clinicians develop activities and lessons to improve a child's inferencing skills. When a child has problems with abstract concepts, the speech-language clinician may be able to help design a lesson to simulate additional experiences for the students.

Clinicians also assist teachers who use word processing software for teaching language arts, reading, and writing to maximize the communicative values of those activities. In principle, as children draft, edit, and share stories they are creating, they learn to use reading and writing skills. Collaborating with the classroom teacher, clinicians extend an essentially reading/writing activity into a speech and language one. Typing the child's words, sentences, or narration, the clinician solicits additions or revisions. The child or other children in the group add or revise.

Teaching Stimulation Techniques

Classroom teachers would not be surprised to find that drill and practice, tutorial, and simulation software offer numerous opportunities to enhance a child's speech and language. Clinicians in a technology partnership often find themselves in the role of teaching the teacher. Cuing and prompting and the QCQ techniques have been previously described in this Tech Use Guide. Two additional procedures used in language therapy, expansions and expatiations, are worthwhile. Expansions are comments to a child's utterance where the teacher expands or elaborates upon the vocabulary used by the child. For example, a teacher could expand a child's naming of the barnyard animals in the farm scene in the *Explore-A-Story* series by naming additional animals that might be found in a barn or by telling the child about buildings or equipment that could be found on a farm. Expatiations, on the other hand, involve rewording a child's response into a more complete or advanced grammatical form. Again, using the barnyard scene in *Explore-A-Story*, if the child describes some event (e.g., "The horse is running"), the clinician or teacher uses an expansion such as "Yes, the horse is running in the corral" or "The horse will jump over the fence after it runs around." Expansions and expatiations are used as part of the QCQ technique to keep communicative interactions active between the child and the teacher.

Serving as a Technical Advisor

Clinicians often provide technical advice and assistance about how to hook up, set up, or use different peripheral devices. As more and more classroom teachers use word processing software and talking word processors in particular for language arts activities, speech and language clinicians are a useful resource. Explanation without practice is incomplete, so one of the responsibilities of the technical advisor is to watch the teacher work with the program and provide feedback and guidance on how to use the activity as a catalyst for utilizing speech or language skills.

Participating in Software Selection

Speech-language clinicians assist teachers and administrators in identifying and evaluating software that might be used both for teaching subject matter and for stimulating speech and language. Classroom teachers look at the content and organization of a software program for consistency with curricular objectives. Speech and language clinicians are particularly sensitive to the type and level of language used in a program, ways software can be modified to stimulate speech or language delays, and how software content and operation functions as a catalyst for communicative interactions. Simulation programs, particularly those using animation or synthesized speech, are easily integrated into therapy activities.

CONCLUSION

Synergy is the result of interactions between two or more forces to produce an outcome that is superior to what individuals could create by themselves. The technology partnership of the classroom teacher and speech-language clinician in the use of software is synergistic. Transfer of speech and language performance is accentuated, and academic subjects are reinforced. The ultimate beneficiaries of synergy are the children who are better able to use speech and language to learn and to express themselves in the classroom.

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Resources

Information

Foundation for Technology Access, 1307 Solano Ave., Albany, CA 94706-1888; 415/528-0747.

National Support Center for Persons with Disabilities, International Business Machines, P.O. Box 2150, Atlanta, GA 30055; 800/IBM-2133.

Journals/Newsletters/Software Directories

Apple Computer Resources in Special Education and Rehabilitation, DLM Inc., One DML Park, Allen, TX 75002; 800/527-4747.

1990 Closing the Gap Resource Directory, Closing the Gap, P.O. Box 68, Henderson, MN 56044; 612/248-3294.

Computer Users in Speech and Hearing, CUSH Business Office, Attn: William Seaton, P.O. Box 2160, Hudson, OH 44236.

Technology and Media Division (TAM) Newsletter, The Council for Exceptional Children, Attn: Susan Herre, 1920 Association Drive, Reston, VA 22091; 703/264-9435.

Software Products

Explore-a-Story: The Lima Bean Dream, D. C. Heath & Company, 125 Spring St., Lexington, MA 02173; 800/235-3565.

Facemaker Golden Edition, Queue, Inc., 338 Commerce Dr., Fairfield, CT 06430; 800/223-2224.

The Print Shop®, Broderbund® Software, P.O. Box 12947, San Rafael, CA 94913-2947; 800/521-6263.

Tech Use Guides on the following topics are available from the Center upon request:

Guide for Teachers
Guide for Parents
Technology for Work, Home, and Leisure
Computer Access
Selecting Software
Speech Technologies
Preschool Children
Hearing Impairments
Computers and Writing
Computers and Cooperative Learning
Visual Impairments
Learning Disabilities
Telecommunication Networks
Augmentative and Alternative Communication
Mildly Handicapped
Emotional and Behavioral Disorders
The Role of the Speech Therapist

This material was developed by the Center for Special Education Technology under Contract No. 300-87-0115 with the Office of Special Education Programs, U.S. Department of Education. The content, however, does not necessarily reflect the position or policy of OSEP/ED and no official endorsement of the material should be inferred.

This guide was prepared by Arthur Schwartz, a professor of Speech and Hearing at Cleveland State University. He has over 20 years experience with language and learning disabled children. Dr. Schwartz has authored numerous articles on computer applications in communication disorders and has presented workshops and short courses to school districts across the country. He is also an officer of the Division for Childhood Communication Disorders of the Council for Exceptional Children.