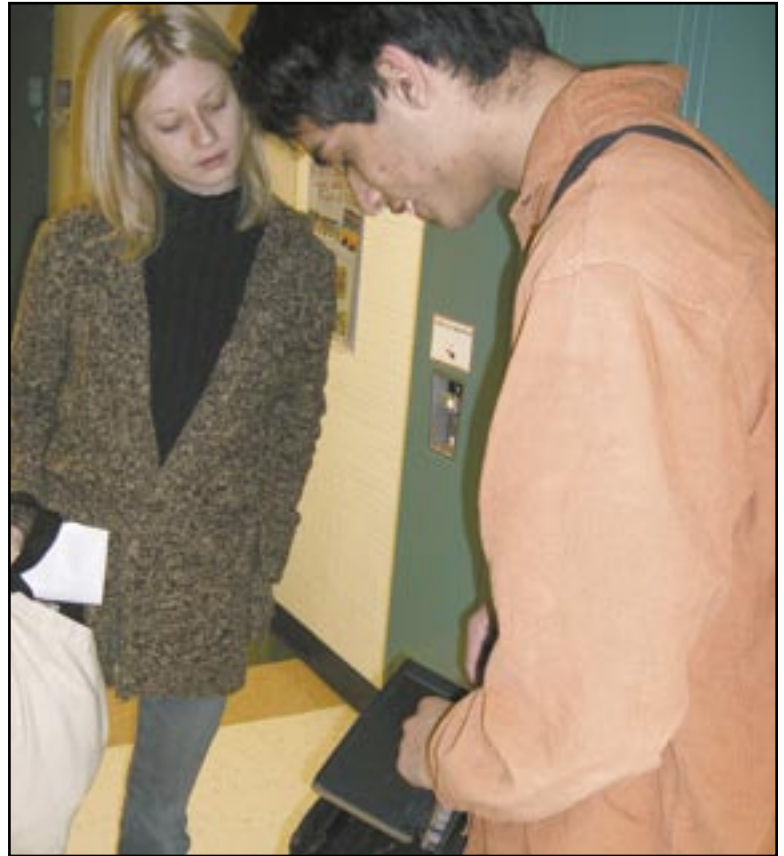


From PECS to high tech: A systematic approach

By Fonda Lowe and Amanda Beattie

R is a 16-year-old teen with autism who primarily communicates with a speech generating device (SGD). He also uses gestures, vocalizations, picture icons, and sign when his SGD is not working or does not have the vocabulary needed to communicate his message. One day, R's teacher brought ingredients to school to make s'mores (chocolate and marshmallow melted on a cracker) for Sibling Night (an activity that would be occurring in the evening). R looked in the grocery bag and immediately took out his SGD. He began navigating through pages looking for the vocabulary needed to construct his request. With the device, he made the sentence "I want + chocolate + cracker". Next he found his book with picture icons. This book is always in his desk in case his device is not working. He then gave the teacher the icon for marshmallow. To finish his request, R went back to the SGD and said "microwave please". He was very successful in communicating his message (he wanted to make s'mores) and of course the teacher complied, even though the goodies were not intended for his class.

R is just one of the many students in the Ivymount Autism Program using an augmentative or alternative communication (AAC) system, from picture based systems to dynamic display SGDs. The Autism Program serves a total of 43 students with autism and pervasive



Student reports on a previous activity.

developmental disabilities within the Ivymount School. The school is a nationally recognized non-profit day school for children with disabilities located in Rockville, Maryland. The teaching strategies employed by the Autism Program are based on the methodology of applied behavior analysis (ABA). This article will review some of the basic teaching principles we employ and demonstrate the application of these principles when teaching students to use an AAC system.

The principles

Perhaps the most important teaching principle we use is reinforcement. Reinforcement increases the chances of a particular behavior or skill occurring again in the future. The first function of communication we teach our students when introducing an AAC system is the request function. When a student makes a request for a preferred item using the AAC system, they immediately receive the preferred item. Receiving the preferred item has

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Student is requesting a snack.

reinforced his or her use of the AAC system and the student will be more likely to use it again. The student becomes more motivated to use the AAC system because they have learned that using it enables them to access preferred items. Student investment in the AAC system will facilitate the teaching of other language functions in the future. Social reinforcement for using the AAC system is also incorporated into our teaching.

In order to maximize student success, we employ an errorless teaching method. This method allows the student to practice the skill without making mistakes. Most to least prompt fading is used when teaching a student to use an AAC system. This means that the teacher provides the most amount of prompting necessary in order for the student to be successful. Over time, the teacher systematically fades the amount of prompting they provide until the student is independently using the AAC system. In most cases, physical and gestural prompts are used, as these types of prompts are easier to fade than verbal prompts.

Systematic teaching is important when a student is learning to use an AAC system. This concept can be applied to individual language behaviors. For example, initiating a request with a communication partner using a dynamic display SGD is a complex skill that can be broken down into component parts. The student needs to approach a

communication partner, gain the attention of the communication partner (typically the student will use the device to say “Excuse me” or exchange an “Excuse me” icon), sequence the appropriate cells to make his or her request, and, in some cases, activate the device to talk by tapping the sentence bar. If a student is having difficulty making a request using an SGD, breaking the task into its component parts allows the teacher to specifically identify which step of the skill the student is having trouble with.

Systematic teaching also plays a role in teaching the various functions of language. We focus on teaching one function of language at a time. When a student starts using an AAC system, his or her system is limited to vocabulary necessary for the request function. Systematically, we add vocabulary as we introduce new language functions. For many of our students, filling up his or her system with too many icons at once may overwhelm or confuse the student. Systematically adding vocabulary as new language functions are introduced will allow the student to be more successful.

Incidental teaching is another strategy we use when students are learning to use an AAC system. Incidental teaching requires the teacher to seize the moment when naturally occurring opportunities arise. The example described in the beginning of the article illustrates an incidental teaching opportu-

nity. The teacher was not aware that R would be interested or even notice the ingredients she brought into the room. Had R demonstrated interest in the s’mores ingredients by pointing to them without using his SGD, the teacher would have prompted him to use his device and/or picture icon book. It may also be necessary to sabotage the environment to systematically create situations for incidental learning opportunities. For example, if a student is learning to request help, a list of possible opportunities could be created to target across the day, such as putting a student’s favorite food on a high shelf or in a container that is difficult to open, unplugging the TV, VCR, or computer, or removing pieces from a task completion activity. The important thing to remember is to not sabotage the same opportunities every day. Otherwise the student may learn to always ask for help in a particular situation even if they don’t need it.

Applying the principles – getting started

R, like many of the students in our autism program, entered the program without a functional communication system. While some students may use speech or signs to communicate, most do not consistently use the modality to convey their needs or wants. Instead, these students use a variety of non-verbal behaviors to communicate. Initially, picture icons are introduced to allow the student communicate wants and needs. Small (1 ½ to 2-inch) pictures icons are used, representing preferred foods and activities. Students are taught to initiate a request by exchanging a picture icon for the desired item. Situations are designed which require the teacher to wait for the student to initiate the request by having the student hand the icon to the teacher. If prompts are needed, hand-over-hand prompting is employed.

Once the requesting behavior is established with multiple reinforcing activities or foods, the student is taught to approach a communication partner and gain his attention by handing the icon to the person. Visual discrimination of multiple picture icons is targeted so that the student can choose the desired item from an array of pictures in a communication book. Once a student can consistently discriminate between icons, an icon for “I want” is introduced to increase utterance length. The student now is required to make a request with two icons

to formulate the sentence “I want + item”. Requests for desired items (food, leisure activity), necessary items (something missing to complete a task, something needed to perform a task), and assistance (help) are all requesting opportunities that are targeted.

Moving to and choosing SGDs

For many students, their vocabulary has increased to the point where their communication books have become bulky and unmanageable. It became increasingly clear that an SGD would be a more practical communication system. Most students have easily generalized the requesting function to the SGD. A variety of devices are presently used by our students. We typically choose devices that are light-weight and portable since many of our students travel into the community to job sites and to go shopping. Most of our students with good visual discrimination are using dynamic display synthesized voice devices, some with the addition of word prediction software. Other students are using multi-message digitized voice output devices using overlays and multi-level digitized voice output devices using overlays.

When adding language to a device, it is very important to consider if it will be used to initiate a message, as with making requests, or as a response to questions and comments. When language is added that targets response messages, one must consider the student’s receptive language skills. It is also important to consider the student’s social connectedness; their interest in communicating with others. Many of our students are primarily motivated to communicate their wants and needs, while others will attempt to communicate for other purposes, such as bringing attention to novel occurrences or items of interest.

Once the student is consistent with making requests, other communication functions are systematically introduced. Social routines, such as greetings and answering personal questions, are targeted. Since answering personal questions requires the student to discriminate between questions (e.g., “What’s your name?” “Where do you live?” “What’s your telephone number?” etc...) not all students are successful using the SGD and may require an ID card with all the information. Informing or reporting information by making comments about self and others is another function that is system-



Student tells the teacher that he is leaving the classroom.

atically targeted. Many of our students with significant receptive language deficits have been successful learning to use their device to report information as part of a chain of events. For example, after finishing an activity, the student will approach an adult and report “I’m finished” or before leaving the classroom the student will report “I’m leaving.” A visual prompt can be incorporated as an icon into the student’s schedule as a prompt for the student to communicate this message.

For students with better receptive language skills, comments may be taught in response to a question. Some students are

able to discriminate questions that require them to report on past and future events so they can inform others about activities they will or have performed during the day. Examples include “I’m going to the grocery store” in response to the question “Where are you going?” or “I made a pizza bagel” in response to the question “What did you make in cooking group?”

Requests and comments are formulated in a variety of ways. Some are designed as single hit messages (e.g. “Excuse me,” “I need to go to the bathroom”) while others require multiple hits to construct the message. For example “I went to the grocery store”

requires three hits. A typical configuration will include a home page that enables the student to initiate a variety of language functions. It also allows the student to navigate to other pages to complete the message. On the home page, the student can gain attention (“Excuse me”), initiate requests (“I want...”), initiate comments (“I’m finished,” “I don’t understand,” “I need help”), use social pleasantries (“Please,” “Thank you”), as well as respond to questions requiring personal information or to report. When the “I want” cell is hit, the device navigates to a page with category icons depicting things the student may want to request. These may include food, drinks, activities, kitchen and classroom supplies needed to complete a task, and other things the student finds enjoyable (e.g., jewelry, art materials). For students who are motivated to share information with others, we include an icon on the home page to navigate to a page with sentence starters such as “Look at the” or “I like to”. When the student hits the sentence starter, it opens to a page with categories of topics the student likes to comment on.

Through the application of ABA principles when teaching students to use an AAC system, we strive to provide students with a functional method of communication that allows them to engage in a variety of language functions. The scope of language functions in any student’s repertoire should be individualized based on the needs of each student. As staff involved with the introduction and development of the use of an AAC system with students, we should always keep in mind the cognitive, motor and visual skills of the student, as well as the student’s motivation to communicate.

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