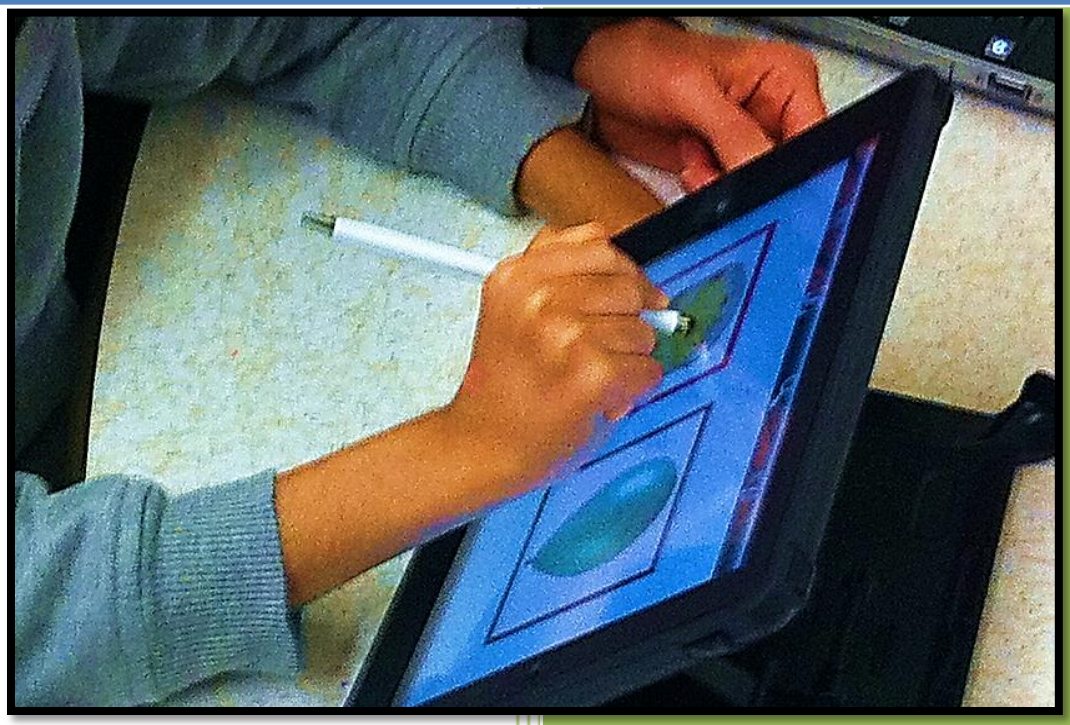
SCHOOL-BASED AAC EVALUATION:

Choosing Effective Assistive Technology Strategies for Students with Complex Communication Needs



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AAC: *"Augmentative or Alternative Communication (AAC) is any device, system, or method that improves the ability of a child with a communication impairment to communicate effectively*."

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"Share the aloha…"

Dedicated to all of my A.T. team members, past, present and future (Margaret Janda, Georgia Magnera, Rosemary Bogart, Anja Kintsch, Nancy Lamb, Brittany Horlbeck, Jennifer Leonesio, Erika Brandstatter...); to colleagues, friends, and mentors; and of course, to all of our students.

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Table of Contents

INTRODUCTION

AAC: *"Augmentative or Alternative Communication (AAC) is any device, system, or method that improves the ability of a child with a communication impairment to communicate effectively*."

Students with complex communication needs face unique challenges in the school environment. They struggle to participate fully in academics and school activities, to interact with their friends and teachers, and to impart what they know. As part of the local school district's Assistive Technology Team or "AT Team" (for Boulder Valley Schools in Colorado), I have been teaching and working closely with these students for many years. The ideas and procedures contained in this manual have gradually become organized and formalized through trial and error, reviewing research, corresponding with other professionals, and, most importantly, following our students as they change teachers and progress though classes, grades, and schools, and transition into adulthood.

Why consider a school-based AAC evaluation protocol when there are already several excellent clinical resources and tools available? Of course, in all cases the general purpose is the same: to find effective ways to enhance communication. The interesting points of difference lie in the details:

- Clinical AAC evaluations are generally conducted over several sessions over a relatively short period of time. Ongoing therapy and follow-up, while certainly options, do not always occur. While initial school-based AAC evaluations are often conducted during a single session, **follow-up** is essential to the total process--in the classroom and with the team and family intensively for a few weeks (or months), then later, over the years, as the student grows and matures.
- **Information gathering** can be different. For a clinical AAC evaluation, whatever paperwork is available (sometimes this can be minimal) is reviewed, and an entire evaluation session may be devoted to gathering background material during a family interview. In contrast, school-based teams usually have access to an extensive paper trail of previous evaluations and IEPs, and the family and teacher interview may be relatively short (e.g., 30-60 minutes).
- The **data collection and analysis phase** can be different as well: a clinical AAC evaluation is conducted with certain specific testing tasks using an array of "tools" (toys, symbols, devices) with the student interacting with the clinician or a family member. In contrast, a school-based AT Team can observe the student interacting in the classroom with peers and staff (a "naturalistic academic environment"), observe any communication gaps as they occur, and then trial strategies (as needed) that might help during the interactions. Of course, the student can also be pulled out and specific elicitation tasks (fine motor, visual, cognitive, etc.) tried out on the spot.
- The specific evaluation **goals** might also be somewhat different. While both clinical and school-based teams are naturally concerned with the "child as a communicator" (i.e., increasing vocabulary, mean length of utterance, grammar, etc.), the school-based team has an additional responsibility to address the unique role of the "child as a student" within the academic setting of the classroom (i.e., looking at **functional** AAC strategies to help the student participate more effectively).

This manual is written as a practical, "nuts and bolts" guide for school-based assistive technology teams and service providers. It follows a natural progression from background material on

communication through descriptions of the specific assessment and decision-making procedures that have proven to be most useful, through actual case studies, and finally, an Appendix with an "AAC Skills Inventory"—a master checklist of relevant student skills to consider during the assessment. This manual can be used by itself or in tandem with any of the other extremely useful assessment tools listed in the Bibliography.

The School-Based AAC Evaluation procedure is adapted from Nation & Aram's classic text, *Diagnosis of Speech and Language Disorders,*[1] and consists of four parts:

1. **Information gathering,**
2. **Data collection and analysis,**
3. **Generating an action plan, and**
4. **Monitoring and following up (as needed).**

Each of these steps is considered in detail in this manual.

The school team or family typically initiates the School-Based AAC Evaluation process. They might be wondering whether any type of technology exists that would be of some benefit to their student, or they may have heard of some new type of technology that they feel might be an excellent "fit." In either of these cases, the AAC Evaluation protocol can provide quantitative data and a solid evidence-based rationale for various assistive technology strategies, some of which may not be immediately evident.

When the school team and/or the student's family decide to initiate the AAC Evaluation process, a standardized referral form is filled out with information pertaining to the student's communication and learning profile.[2] There is a section for the family to indicate their concerns—this is especially important to insure that everyone is "on the same page" as far as perceptions regarding the student's strengths and challenges, as well as expectations for conducting the AAC Evaluation. Signatures are obtained from all stakeholders and the referral form is sent, together with a copy of the most recent IEP (and any school-based or private evaluation reports that may shed light on "the issues") to us so that we can schedule an appropriate time for the evaluation to take place.

Once the student has been evaluated and assistive technology strategies have been put into place, the student becomes a part of the AT Team caseload and will be followed from grade to grade and school to school until s/he graduates from the system or else s/he no longer needs AT services.

[1] The Nation & Aram (1991) model consists of: 1. Constituent analysis—gathering background information; 2. Clinical hypotheses—generating "educated guesses;" 3. Clinical design—designing an appropriate evaluation for the student; 4. Clinical testing—meeting with, and testing the student; 5. Clinical data analysis—reviewing results; 6. Clinical interpretation—generating explanations; 7. Conclusions—reaching conclusions based on the previous steps in the process.

[2] A sample referral form is included in the Appendix, page 41. Please also review various possibilities posted on the Internet.

CHAPTER 1: BACKGROUND

"If my possessions were taken from me with one exception, I would choose to keep the power of communication, for by it, I would soon regain all the rest." (Daniel Webster)

Communication may be defined as "the process of exchanging information and ideas. An active process, it involves encoding, transmitting, and decoding intended messages."[3] Language is a type of communication code in which we make specific symbols stand for something else. These symbols and the code are arbitrary and must be learned. For example, there is no objective reason why the word "house" (or the specific sounds that comprise the word) should signify "a building in which people, especially members of a family, reside." The only requirement is that the code is agreed-upon (and conventionalized) by members of the same community or language group. Speech is the actual behavior of producing this code by uttering the vocal sound patterns appropriate for the language. Receptive language refers to decoding the messages (language comprehension), whereas expressive language refers to encoding and formulating the messages to a communication partner.

Speech and language are important for communication, but they are only a part of communication. Speech prosody (the "music" of speech) is also crucial for expression: an utterance may be delivered in a monotone, or carefully modulated in terms of intonation, stress, rate of delivery, and pause/hesitation. This aspect of communication is termed "paralinguistic." Non-linguistic communication includes things like gestures, posture, facial expression, eye gaze, and proxemics (physical distance between communicators). Metalinguistic communication pertains to talking about language, analyzing it, judging it for acceptability within the social context, etc.

Learning Communication Skills

In typically developing children, the process of language acquisition is usually smooth and seamless and different "stages" are barely noticeable and seem to come and go quickly. For individuals with more complex communication needs, stages may develop slowly, intermittently, and in an idiosyncratic fashion.

There are a number of developmental schemas for language acquisition, and they vary slightly from case to case; some overlap, some emphasize one skill or stage over another, some are sequenced unevenly and to compare them or to reconcile them with each other is really "splitting hairs." The model that has proven most useful and practical for the students our team works with is based on three levels of communicative ability.[4] The basic paradigm is that the individual progresses in some fashion through the following phases:

[3] This discussion is based on Owens and Reed, p. 40-41.

[4] I have collapsed and blended several of the levels of the "Seven Levels of Communicative Competence" schema used by Charity Rowland and Philip Schweigert. This schema is outlined in detail on the excellent Design to Learn and Communication Matrix websites and also in several of their papers.

1) ***Emerging Communicators:*** *pre-intentional (reflexive, reactive), beginning intentional, and pre-symbolic communication,*
2) ***Beginning Symbolic Communicators:*** *intentional communication using symbols one at a time (no symbol combinations or syntax),*
3) ***Intermediate/Conventional Symbolic Communicators:*** *using multiple symbols with specific ordering (syntax).*

Three Levels of Communicative Abilities

Why should it be necessary to demarcate communicative "levels" at all? In order for students to learn effectively, it is important to teach and interact at an optimal range of difficulty--what Vygotsky termed a "zone of proximal development." Too easy would bore them and too difficult would bewilder them—either way it would be discouraging and dis-empowering and would not encourage students to communicate their unique vision of the world. In order to address this issue, and to more effectively serve our student population, we have found it useful to group our students according to the three generalized communicative profiles listed above: **Emerging Communicators**, **Beginning Symbolic Communicators, and Intermediate/Conventional Symbolic communicators.** Please keep in mind that these profiles are fluid and only approximate: many times students display "splinter skills," or appear to be functioning at a transitional stage between different levels.

Level 1--Emerging Communicators These are pre-symbolic communicators: individuals who may display reflexive/reactive behavior (laughing, crying) which is interpreted **by the observer** as communicative; individuals who exhibit intentional goal-directed behavior (not necessarily directed towards another person); or individuals who exhibit intentional **communicative** behavior (goal directed behavior directed towards another person) using gesture or natural non-symbolic means.

Level 2--Beginning Symbolic Communicators might be using some symbols: manual sign or sign approximations, vocalizations, stylized gestures (including pointing), and verbalizations or verbal approximations. They use the symbols one at a time and have not started combining them together much, if at all. They might use (or have tried) picture or object-based communications strategies, or a single or double-message speech generating device to indicate a simple greeting, the desire for reinstatement of a preferred activity, or a choice between two activities.

Level 3—Intermediate/Conventional Symbolic Communicators may be using a modest number of symbols (i.e., perhaps 25 or more)--manual signs or sign approximations, pictures, verbalizations (or verbal approximations), either one at a time or in combinations.[5] They might be using some form of conventional syntax or word order, either in simpler form (e.g., I want.... I like... I go... etc.), or else in more sophisticated combinations and complex sentence generation.

[5] Research indicates that children begin to combine words after acquiring approximately 50 words in their repertoire. See for example Bates, Thal, Finlay, & Clancy, 2003.

AAC and Multimodal Communication

For students with complex communication needs (i.e., individuals who do not proceed smoothly along through the levels of communicative competence in a timely manner), speech-language therapy might be appropriate, as well as some form of assistive technology accommodation. As mentioned, "Augmentative and Alternative Communication" (AAC) can be defined as any device, system, or method that improves the ability of a child with a communication impairment to communicate effectively. It can include sophisticated devices and systems (sign language, communication boards, or speech-generating devices) as well as less sophisticated means (pictures, objects, etc.) AAC is introduced when the student does not develop communication in the typical fashion, or experiences significant delays, and is used to AUGMENT whatever communication the student possesses, as part of a "multi-modal" system. Typical indicators for introducing some form of AAC might include (but are not limited to): a moderate to severe expressive speech/language disorder, an expressive/receptive language gap (the student understands more than s/he can say), limited speech or expressive language improvement with therapy, and/or the student's frustration at his/her inability to communicate messages effectively.

Multimodal communication[6] is the use of more than one type of communication method during an interaction. It can include speech (verbalizations), verbal approximations, vocalizations (and voice inflection), gestures (e.g., pointing), manual sign or sign approximations, facial expressions, eye gaze, body orientation or movement, proxemics (approach/avoidance with respect to a communication partner), inappropriate behavior, etc. Multimodal communication is our natural means of expression—all of us use different modes of expression constantly and are able to "read body language" when we are interacting with others. Much more additional information is conveyed in this manner than would be possible through single modes.

People naturally use different communication modes in different social circumstances—what might seem appropriate with friends in an informal interaction would be totally out of place interacting with your professor, or with your new in-laws at a wedding, for example. Similarly, a student who communicates with a paraprofessional with manual sign language would need to have the flexibility to communicate via a different mode in the community with individuals who do not understand sign.

Students with complex communication needs will always rely on the easiest and simplest means of expression, as long as it is effective. If they can point, they will point. If they can smile, they will smile to let you know they are happy. If they can guide you by the hand to get a snack, that is the way they will naturally let you know they are hungry. In these contexts, using a complex, high-tech, speech-generating device might be cumbersome and ultimately less effective (it is unnatural to expect anyone to choose a more complicated method of communication over an easier and more efficient one). It is when students need to refer to something not present, not available, or not easily represented by no-tech or low tech means that more complex modes of AAC can become almost indispensable. That said, it is important to foster flexibility and have alternative means available for when the primary mode of communication is unavailable for whatever reason: if the high tech device is broken or malfunctioning, for example.

[6] See the Loncke, et al. article on Multimodality (see the Bibliography for the reference). Much of the above discussion is based on that article and material available on the excellent YAACK website (see the Bibliography).

Four key points to consider:

1. USE APPROPRIATE TECHNOLOGY. Do not use technology just because it is sophisticated or expensive or may be the "newest" or "coolest"—consider what will work best in context through careful assessment and feature-matching and introduce what will truly enhance the student's existing skills.

2. USE THE LAW OF PARSIMONY. The simplest solution is frequently the best and, in the context of AAC, the easiest and the most effective. In addition, the more variables, the more difficult things will be to control, and the more things can go wrong.

3. NO PREREQUISITES. It is important to remember that "communication" and the term "AAC" may or may not involve the use of a symbol system such as objects, pictures, manual sign, or language. Current conventional wisdom and best practice states that all individuals can learn and thus there are no prerequisites for communication. As educators, we can only guess about a student's true potential; we have to give him/her the benefit of the doubt and jump in and teach. In the past, therapists and teachers tended to wait until the student reached a certain developmental threshold before introducing specific AAC strategies. Even now it is somewhat controversial how this is interpreted (some recent articles in the AAC literature allude to this). **Again, there are NO prerequisites for communication!** However, we need to keep in mind that communication may look very different and incorporate several different modes of expression.[7]

4. AAC DOES NOT IMPEDE OTHER COMMUNICATION MODES. The use of voice output communication devices will not be in any way a replacement for other means of communication like speech or manual sign, but it will actually serve to improve a student's overall communication capability and encourage him/her to communicate more (all of the research in this area indicates that this is the case).[8] In addition, a device can give the student an auditory "speech model" that s/he can listen to and possibly practice with his/her own voice, should that become a possibility in the future.

[7] See Kangas & Lloyd, 1988 for an excellent (and classic) discussion of this crucial point.

[8] See the discussions of this on the YAACK website, in Schlosser, 2003, Millar, Light, & Schlosser, 2006, and Schlosser & Wendt, 2008.

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CHAPTER 2: AAC EVALUATION PROCEDURES

As mentioned, there is a four-step process for the School-Based AAC evaluation: 1. information gathering, 2. data collection and analysis, 3. generating an action plan, and 4. monitoring and following up (as needed).

OVERVIEW: STEP 1--Information Gathering

In the first step, the focus is on collecting and analyzing background information—much of this will probably already be in place—from knowing and working with the student and establishing his/her communication patterns. However, it is always useful to ask:

- What are the specific concerns? What tasks are we asking the student to perform (goals)?
- What is already known? (age, medical history, cognitive, communicative, physical considerations, family, culture, community)
- What should be assessed and how should it be assessed?

We can generate hypotheses--what "educated guesses" can be made? We can look at what has already been tried, if anything, and try to formulate the "most likely" cause/effect relationships. At this point, we can make a tentative decision about whether our student has a Level 1 Emerging Communicator, Level 2 Beginning Symbolic Communicator, or a Level 3 Intermediate/Conventional Symbolic Communicator profile (or a combination). We can also hypothesize about access: what physical considerations need to be taken into account for the student to be able to access appropriate augmentative communication technology? What are his/her visual motor and fine motor abilities? Can s/he use direct access and press a picture or icon on a communication device with his/her index finger, stylus, or a pointer? Or will s/he need to use switch scanning of some kind?[9]

We plan the evaluation, considering the most appropriate environment and various interaction options, and the frequency and duration of the activities/tasks. Should we test narrow, specific areas, or use a "shotgun" approach, testing many areas quickly? Should we conduct multiple sessions? In what type of setting(s)? Should we use portions of standardized tools, if they are available, or plan an informal assessment? Should we plan for having several observers or assessors?

[9] **ACCESS—**the simplest access is "direct selection": the student presses the icon or chooses the desired picture and that is his/her communicative act. If the student is unable to direct select, this necessitates using a switch (or "microswitch") placed in an appropriate location so that s/he can communicate. In the simplest scenario, a single communicative act can be made with a single switch. With choice making, however (a field of more than one), you would need to either introduce multiple switches placed in multiple locations (one switch for each choice), or else introduce **scanning**. Scanning refers to a technique for a sequential display of a set of items and selection using a small number of switches. It should be noted that scanning is commonly considered to be a much more difficult physical, cognitive, and sensory task for students than direct selection: it is slower and more laborious, requires certain memory skills, involves substantial waiting, and necessitates learning what a "sequence" of different choices means—(see the relevant discussion in Ratcliff, 1994). A more detailed treatment of switch use can be found in Bogart & Visvader, 2009, Korsten, et al., 2007, and Bean, 2011.

OVERVIEW: STEP 2--Data Collection and Analysis

In the next step, "data collection and analysis" we actually have direct contact with the student and observe his/her interactions with peers and adults and try out activities designed to test our clinical hypotheses (our "best guesses," based on our information gathering). Flexibility is paramount as is the ability to adapt, based on circumstances and an ongoing analysis of the student's response patterns. Original hypotheses and presuppositions may be inaccurate, flawed, or incomplete. In addition, conducting the evaluation over multiple sessions and/or multiple settings may be desirable—the student may be tired or might be having a bad day when the evaluation is scheduled, or may perform better at home or outside in the playground, for example. Ideally, the student could be videotaped for subsequent analysis. Many communicative subtleties can be missed when people are in the midst of a complex interaction in a busy (and sometimes noisy) classroom. If videotaping is not a possibility, it might be possible to arrange for multiple observers being present instead. Our own team approach is to include everyone: the speech-language pathologist, the occupational therapist, and the special education teacher in the evaluation, with at least two team members observing at any given time during this stage. Some of the activities that an AT Team **might** engage in during this step (depending, of course, on the student's individual profile) are described in the next section of this manual: "Observation/Elicitation Tasks" (p. 10).

OVERVIEW: STEP 3--Generating an Action Plan

During the third step, when we "consider strategies and generate an action plan," we analyze the background information and the observation/testing session data and make logical sense out of the information that has been gathered. We generate interpretations of the data and pose theories based on assessment results, discuss this with the team and family, consider possible revisions and reinterpretations (especially if results are inconclusive, unexpected, and/or controversial) and consider this in terms of the scientific process: reliability and validity, consistency and repeatability, logical explanation and interpretation, and ultimately the predictive value for teaching. Then we decide what is to be done and how it is to be done (the action plan) by carefully **FEATURE MATCHING** available tools and resources to the student's unique learning profile (see Chapter 3, p. 17).

OVERVIEW: STEP 4--Monitoring and Following Up

The fourth and final step of our evaluation is "follow-up"—suggesting that the assessment is never in a state of "static completion," where we walk away and wait for the student to grow into our action plan. Rather, follow-up is perhaps the most important stage and implies a dynamic equilibrium—as things change, we adjust the strategies, as needed, so that they can continue to be most effective. For this, we rely on the team and family maintaining contact in the form of questions, feedback, consultations, and sometimes, re-evaluations (if the circumstances have changed dramatically).

THE "AAC TOOLBOX" (A GENERAL DISCUSSION)[10]

When considering a student as a potential candidate for AAC, it is important to be aware of all of the possibilities that exist as far as appropriate technology is concerned—thoroughly understanding, and knowing how to use, all of the "tools in the AAC toolbox." There are several different AAC classification systems in use at the present time. A particularly useful one for our needs is the one described by Marilyn Buzolich, the founder and director of Augmentative Communication and Technology Services (ACTS) and co-founder of the Bridge School:

- **No Tech:** These are "unaided" systems an individual uses with no additional tools or technology such as motor behaviors, gestures, vocalizations, verbalizations (or verbal approximations), proxemics (approach, avoidance), eye gaze, and facial expressions.
- **Low Tech:** "aided" communication strategies (i.e., requires some type of external assistance for the symbols) which do not run from a power source--such as picture or object communication, PECS (Picture Exchange Communication System), partner assisted auditory scanning, etc.
- **Light Tech:** voice output communication systems which are typically battery operated and have a static (non-changing) display such as the BIGmack, Rocking Plate Communicator, Step-by-Step, Cheap Talk, Tech/Talk, Go Talk, SuperTalker, or 7-Level Communication Builder.
- **High Tech:** Systems typically requiring an electronic power source and having a dynamic (changing—i.e., computerized LCD screen) display such as a DynaVox Maestro or T-10, a Prentke Romich Vantage Lite or Accent, or a Saltillo ALT-Chat or NOVA chat.

AAC (speech generating) devices may have **digitized speech output**: a time-sampled replication of actual human speech. You speak, and it records what you say so that the student can use that utterance in the context of a communicative interaction. AAC devices with **synthesized speech output** translate the user's input (choosing letters, words, or symbols) into computer-generated speech. Generally speaking, digitized speech is more natural sounding than synthesized speech in terms of pitch, resonance, and prosody.

Some devices (both digitized and synthesized) use a **"leveling"** approach to language storage and retrieval. Traditional "leveling" systems such as the DynaVox Interaact "child user" or "teen user" incorporate a phrase-based approach to communication: you press one button and a phrase or sentence like "I need to go to the bathroom" will be spoken. Devices with a static display that use a leveling strategy (such as the 7-Level Communication Builder or the SuperTalker) require multiple overlays.

Strategies that are word-based such as the DynaVox "Gateway" build up a message word-by-word according to the rules of grammar—the approach is slow, but allows for the possibility of generating novel or unique utterances ("generative language"). Hybrid systems are also available (e.g., incorporating "Gateway" with the traditional DynaVox "users") for a combination approach.

Devices that use the Unity or Minspeak system of symbol or icon organization (these are designed by Prentke Romich or "PRC") are word-based, and are loosely organized according to "parts-of-speech" (e.g., pronouns on the left, verbs on the right, activities on the upper activity row). They use

[10] A more specific discussion of different "tools in the AAC toolbox" is available in the Appendix, page 35.

"multiple-meaning icons": the picture of William Shakespeare can be used to build up a statement about reading (since he was an author) or the future tense "will" (Will Shakespeare); the picture of the apple can be used to build up a statement about eating or growing. Bruce Baker has been the driving force behind Unity or Minspeak (also called "Semantic Compaction"). PRC devices (ECO2, Accent, Vantage Lite, etc.) have Unity/Minspeak as their starting point, but now also incorporate some leveling and phrase-based strategies to a certain extent.

Operating an AAC device by **direct selection** requires that an individual make physical contact with the selection set (letters, symbols, codes) of the device to construct a message. This can be accomplished by physical contact using a body part (*e.g.*, fingers, toe) or by using an adaptive peripheral device (*e.g.*, a splint, mouth stick, head pointer, head mouse). The standard computer keyboard is an example of a device that uses direct selection (by the fingers). AAC devices that support **indirect selection** have special software and hardware that allow them to interpret input from a source other than the physical keyboard. The most common indirect selection technique is **scanning** (see a brief discussion in the footnote on page 7).

ASSESSMENT: OBSERVATION/ELICITATION TASKS

The following section contains ideas and strategies that we have used during direct observation/interaction with students. Specific activities selected can vary considerably depending on the student's profile and we may (or may not) use only a few of the elicitation tasks as described. However, it is usually desirable to spend at least part of our time observing the student in a more "naturalistic" setting—in the classroom interacting with peers and staff, following the classroom routine, etc. Occasionally, it might be useful to observe the student in additional settings (e.g., at home or in a session with a private therapist), particularly when there is a reported inconsistency or disparity in student performance with different communication partners or in different environments.

ASSESSMENT ACTIVITIES

Observation	**NATURALISTIC ENVIRONMENT**
Elicitation Task 1	**DETERMINING PREFERRED/NON-PREFERRED ACTIVITIES**
Elicitation Task 2	**SEMI-STRUCTURED ACTIVITY**
Elicitation Task 3	**SYMBOL PREFERENCE SCREENING**
Elicitation Task 4	**SOUND PREFERENCE SCREENING**
Elicitation Task 5	**FINE MOTOR SCREENING**
Elicitation Task 6	**SYMBOL SEQUENCING SCREENING**
Elicitation Task 7	**LEVELING APPROACH SCREENING**
Elicitation Task 8	**MISCELLANEOUS SKILLS AND TASKS**

- **OBSERVATION: NATURALISTIC ENVIRONMENT—**This consists of an informal observation of the student's interactions with various people and is a **crucial ingredient** in developing an overall picture of the "student as successful (and/or unsuccessful) communicator" within various environments within his/her world. Settings and participants may include:
    - In the classroom with peers
    - In the classroom with teacher/paraeducator/SLP
    - In the classroom with AT Team member(s)
    - At home with parents, siblings, other family members
    - At a private clinic with an SLP or other therapist

  Specific skills and abilities to look for are itemized in detail in our general assessment protocol called the "AAC Skills Inventory," included in the Appendix, p. 47. Other excellent, commercially-available instruments are listed in the Bibliography, p. 27.

- **ELICITATION TASK 1: DETERMINING PREFERRED/NON-PREFERRED ACTIVITIES.** This information regarding preferred and non-preferred activities can normally be gleaned from "Step 1: Information Gathering" through a review of past records, or conversations with family or school team members. If there are any questions, or additional information is required, several activities are possible:
    - Unstructured, informal presentation of various objects, activities that may be of interest to the student based on age, gender, peer group culture, etc. and carefully noting his/her reaction.
    - Administering all or part of the structured protocol described in the **Every Move Counts Sensory Assessment** (Korsten, Foss, & Berry, 2007, p. 79, 137)[11]

- **ELICITATION TASK 2: SEMI-STRUCTURED ACTIVITY**. In this task, one of the AT Team members or someone familiar with the student, can prompt him/her to use the target AAC strategy (i.e., a picture, object, or device) to communicate something: a request, a greeting, a refusal, participation in a game or other activity, etc. Following is a description of possible procedures to encourage the student to request the continuance or reinstatement of a preferred activity:
    - Establish the activity (play activity, mealtime, game time, etc.)
    - Frustrate expectations (sabotage the interaction or create a "communicative temptation")
    - Some suggestions for "sabotage":
        - Time delay—preferred items or activities are present but access is delayed until he/she makes a request.
        - Missing item—An item needed for a preferred activity is missing.
        - Blocked response (interrupted behavior chain)—Momentarily blocking a response or interrupting an ongoing activity.
        - Incomplete presentation—His/her initial request is followed by a partial presentation of the requested item (only part of a puzzle, for example)

[11]See Bibliography for resources (e.g., the *TASP, Every Move Counts, Tangible Symbol Systems, Boston Children's Hospital* activities, etc.)

        - Delayed assistance—Needed assistance is delayed until he/she makes a request.
        - Wrong item format—He/she is given the wrong referent (activity or item) and needs to repair the mistake.[12]
    - Watch for the student's natural response
    - Shape this response into a "desired" response (manual sign, verbalization/vocalization, use of particular AAC device, use of pictures, objects). For students who are on the Autism spectrum or who may have difficulty with communicative intent, a strict behaviorist approach may be indicated (i.e., the PECS—Picture Exchange Communication System—approach)
    - Make note of the student's **"stimulability"** for learning a new "shaped" response, the **prompting** patterns necessary for the successful response, as well as the **wait time** between the cue and the student's response.
    - Allow for expression of the student's refusal ("No"/"All done") Watch for the student's natural response and shape it, if possible.
    - ***ALTERNATIVELY,** consider other possible communicative situations, depending on the student's personality, communicative profile, and classroom (or other) routine. Possibilities could include:
        - My turn/your turn in a play interaction
        - Greetings/partings
        - Yes/no questioning
        - Making basic choices between preferred activities, or preferred and non-preferred activities.
        - Making comments about an object or activity.

- **ELICITATION TASK 3: SYMBOL PREFERENCE SCREENING** for determining the appropriate level of symbol abstraction: objects, photographs, drawings, words, etc. This information can normally be gleaned from **"Step 1: Information Gathering"** through a review of past records, or conversations with family or school team members. If there are any questions, or additional information is needed, several activities are possible:
    - **Tangible Symbol Systems** protocol (Rowland & Schweigert, 2000, p. 23)
    - **Beukelman/Mirenda** protocol (Beukelman & Mirenda, 2005, p. 191)
    - **Every Move Counts** protocol (Korsten, Foss, & Berry, 2007, p. 153)
    - **The TASP** protocol (Test of Aided-Communication Symbol Preference)
    - **Computer and/or iPad-based AAC symbol preference software** activities presented on a touch-screen computer or tablet.[13]
        - Target size—determining the visual target size that is most appropriate for the student (i.e., finding target sizes too small for the student to differentiate)

[12] Adapted from Beukelman & Mirenda, P. 304 (original source: Sigafoos & Mirenda, 2002).

[13] The EvaluWare software, now unfortunately out-of-print, had been an ideal screening tool for many of the elicitation tasks described. Currently, the iPad apps listed in the Appendix (especially the "AAC Evaluation Genie") provide many of the same kinds of activities.

        - Number of targets—determining the optimal number of targets per screen for the student (a field of 2 targets on up to 24)
        - Visual tracking—determining whether a student can visually follow a moving target on the screen.
        - Representation—determining the level of representation or abstraction with which targets are represented on the screen (photographs, color drawings, black and white line drawings, text)
        - Border size—determining whether a student needs a larger border in order to help with differentiating between symbols.
        - Text size—determining the optimal text font size for students who can read.
        - Contrast—determining the optimal contrast scheme to help the student perceive visual materials on the screen.
        - Scenes[14]—determining whether a "visual scene" format might be more accessible for the individual (rather than a symbol grid).

- **ELICITATION TASK 4: SOUND PREFERENCE SCREENING** for determining voice output parameters. This information can sometimes be gleaned from **"Step 1: Information Gathering"** through a review of past records, or conversations with family or school team members. If there are any questions, or additional information is required, several activities are possible:
    - Unstructured, informal presentation of various AAC systems using natural (digitized) voice and computerized (synthesized) voice.
    - Presentation of computer- or iPad-based AAC sound preference software activity on a touch-screen computer or tablet.
        - Volume—finding a sound volume that is comfortable for the student.
        - Sound feedback—changing the sound the targets make when you touch them.
        - Human or computer voice—comparing computer (synthesized) voices with human (digitized) voices.
        - Voice preference—choose between specific male and female and child voices.
        - Other voice parameters—varying the speed, pitch, resonance, etc. of the voice.
        - Listening comprehension game—determine whether the listener can follow instructions.

- **ELICITATION TASK 5: FINE MOTOR SCREENING** for determining student's best access to AAC system. This information can sometimes be gleaned from **"Step 1: Information Gathering"** through a review of past records, or conversations with family or school team members. If there are any questions, or additional information is needed, several activities are possible:
    - Unstructured, informal presentation of various AAC systems—
        - Choosing a picture by touching, grasping and reaching, eye gaze, etc.

[14] Visual scenes are AAC displays which feature actual digital photographs or drawings of places, situations, people, etc. (e.g., a kitchen, a bathroom, a classroom). Spoken messages can be embedded under related elements in the scene: (called "hot spots"). For example, touching the picture of a cup on the kitchen table can produce a message saying, "I'm thirsty." Or touching a picture of the student in the classroom can produce the message, "My name is Johnny." See the recent work of Janice Light and Kathryn Drager (and David Beukelman) for efficacy data on this strategy (listed in the Bibliography).

        - Pressing various AAC devices with index finger (or other): 6" BIGmack, 2.5" One-Step, Various sized targets on 7-Level Communicator or SuperTalker, etc.
        - Pressing various sized icons on touch-screen computer with AAC software, OR actual dynamic screen AAC device
    - **Priory Woods "Catch Me if You Can" game (on a touch screen computer or tablet)--** range of motion, visual motor hand-eye coordination
    - **Boston Children's Hospital PowerPoint Activity: Chase the Dog game (on a touch screen computer or tablet)** —fine motor precision, range of motion, visual motor hand-eye coordination
    - **Prentke Romich device Unity "Exploration Wizard" User Area (go to Target Child, then Target Practice, Chase, Ducks, or Whack a Mole)**
    - **Freeware "Whack-a-Mole" games**
    - **Computer and/or iPad-based fine motor activities**
        - Range of motion (pictures)—determine whether the user can access all areas of the screen to touch certain pictures or icons
        - Range of motion (numbers)—(same as above, except with numbers)
        - Object spacing—presenting targets of different size and position.
        - Scene for touching—locating different targets within a visual scene
        - Touch up, touch down--changing when actions occur on the screen: when you touch the picture or touch and release it.
        - Timed response—touching the screen to respond to a time-dependent animation.

- **ELICITATION TASK 6: SYMBOL SEQUENCING SCREENING** for determining whether a student can combine two or more symbols into an appropriate sequence (i.e., a basic form of language syntax). This becomes more of a realistic possibility after the student is comfortable using c. 50 symbols (words, manual signs, pictures, etc.) expressively—in our developmental schema, a Level 3 (possibly also a Level 2) student.
    - Unstructured, informal presentation of pictures in a "carrier phrase" structure: "I want...," "I like...," I don't like...," etc.
    - **Boston Children's Hospital PowerPoint Activity: Specked Frogs—**basic sequences
    - **Boston Children's Hospital PowerPoint Activity: Car2Comments—**sequencing pictures to tell a simple story
    - **Sequencing software games or iPad apps: Sequences, Sequencing Activities, etc.**
    - **Appropriate AAC device software (demos) on a tablet computer OR on the devices themselves:**
        - **DynaVox Gateway** (on a T-10, V Max, Maestro, or earlier device)
        - **Prentke Romich Unity** (on an Accent, Springboard Lite, Vantage Lite, ECO2, or earlier device) **ESPECIALLY** the "Exploration Wizard" user area (i.e., "Pic Test 8")
        - **WordPower or Picture WordPower** (on DynaVox device, Prentke Romich device, Saltillo device)
        - Appropriate apps on an iPad, or other similar device

        - **Saltillo PalmChat, Vocab PC, or myCore vocabulary files** (on the ALT-Chat, NOVA chat or other Saltillo devices OR with the TouchChat app for the iPad)

- **ELICITATION TASK 7: LEVELING APPROACH SCREENING** for determining whether a student can comprehend the concept of accessing and navigating between different "pages" of symbols on a dynamic screen system.
    - A "low-tech" approach would be to have a communication book with different pages of symbols, arranged by category. You could have a "greetings" page (with various choices of greetings), a breakfast page (with various breakfast food and drink choices and appropriate request and comments symbols), a recess page (with various activities and outdoor play equipment represented), etc.
    - **Boston Children's Hospital PowerPoint Activity: Dynamic Beginnings**—AAC device pages in a PowerPoint format
    - **Appropriate AAC device software (demos) on a tablet computer OR on the devices themselves:**
        - **DynaVox software** (Interaact software for the T-Series devices, Series 5 devices, or earlier versions for the series 3 or 4 devices)—Child User, Teen User, etc.
        - **Saltillo QuickChat or Primary vocabulary files** (on the ALT-Chat, NOVA chat, or other Saltillo devices OR with the TouchChat app for the iPad)
    - **Speaking Dynamically Pro (**Begin-It Dynamically, Speak-It Dynamically, etc.)
    - Appropriate apps on an iPad, or other similar device

- **ELICITATION TASK 8: MISCELLANEOUS SKILLS AND TASKS**
    - **Target skill: vocabulary**
        - **Words Around Me (Edmark)**
        - **ChooseIt Maker Games**
        - **Others** (e.g., Laureate software)
    - **Target skill: memory/object permanence**
        - **"Concentration" games (or apps)**
    - **Target skill: cause and effect**:
        - **Priory Woods** activities,
        - **SENSwitcher** activities,
        - Other "Keyboard Banger" software (i.e., Google the term)
    - **Target skill: typing messages**
        - **Writing with Symbols 2000 (or SymWriter) software**
        - **Co:Writer software**
        - **Write Out:Loud software**
        - **Other (e.g., talking word processor software)**

Three key points to consider:

WAIT TIME: Wait time or "latency of response" time is a crucial thing to measure: it can vary tremendously from student to student, activity to activity, and session to session. It is ideal to allow AT LEAST 3 seconds up to 20-30 seconds of wait time before using any type of prompting strategy.

PROMPTING: If prompts are used, carefully note whatever prompting patterns are used, and the precise wording if a verbal prompt is used—prompts are integral factors in generating an intervention and skill training protocol. There is a distinction between "cues" and "prompts." Providing a cue is providing the antecedent stimulus just before a particular behavior takes place. e.g., the music stopping just before having the student hit the switch to play a radio. Frequently the student needs help in learning to respond to a cue. A prompt is a reminder that follows the cue to make sure the student responds to the cue. There are six common types of prompts:

1. verbal (signed) prompts;
2. pictorial or written prompts;
3. gestural prompts;
4. model prompts;
5. partial physical prompts;
6. full physical prompt

A number of different prompting systems can be used and the one most often recommended for our students is the "least-to-most" hierarchy. This is essentially providing the natural cue first, allowing for sufficient wait time, and then if there is no response, proceeding down the hierarchy sequentially (as needed) through partial and full physical prompts.

YES/NO CHOICE FORMATS—Keep in mind that yes/no tends to be a later-developing skill, since those words can have a wide variety of meanings and results; yes/no tends to reinforce passive responding rather than active functional communicating; and earlier functions may include greetings, protests, requests for attention or objects, more/all done. See the excellent discussions of this in Cress and Marvin, 2003, p. 259-260 and Beukelman and Mirenda, 2005, p. 309-310.

CHAPTER 3: FEATURE MATCHING THE AVAILABLE TECHNOLOGY WITH THE STUDENT PROFILE

In gathering a comprehensive picture of the student's communicative profile and considering possible AAC strategies, several questions might be of interest:

- How does the student currently communicate? More specifically (based on the three-level schema described above), does s/he have symbolic awareness/abilities? Are we focusing on basic communication, language building, or both?
- How does s/he communicate in different settings or situations?
- What communicative needs are not being met by the student's current system?
- What tools or strategies might help the student augment his/her communicative competence?

We engage in a process called **feature matching** which entails selecting the most appropriate AAC system (including hardware, software, and intervention strategies) based on the student's strengths, abilities, and needs (current and future).

LEVEL 1: EMERGING COMMUNICATOR

If the student does not have linguistic or symbolic abilities (i.e., the ability to understand that one thing might "stand for" or "represent" another), we would consider him/her to be a ***Level 1 Emerging Communicator*** and we need to address issues such as:

1. Developing intentional (goal-directed) behavior,
2. Developing intentional behavior that is directed towards another person (communicative intent),[15]
3. Developing basic symbolic ability.

All children begin life as "pre-intentional communicators," a beginning stage of development in which their behaviors may elicit responses from their caregivers but these behaviors are not INTENDED to communicate anything. For example, a child may cry because s/he is uncomfortable and the caregiver may approach, speak, and change his/her diaper, but the crying behavior is INTERPRETED as communicative by the caregiver. Typically-developing children are able to explore and learn to affect

[15] **COMMUNICATIVE INTENT:** Psycholinguist Elizabeth Bates' classic definition of communicative intent is: "…behavior in which the sender is aware a priori of the effect that a signal will have on his listener, and he persists in that behavior until the effect is obtained or failure is clearly indicated." The most complete and clearly stated criteria for determining whether a student's actions have "communicative intent" are the ones described by Wetherby & Prizant (1989): 1. alternating eye gaze between a goal and a listener, 2. persistence in signaling until the goal is reached, 3. changing the quality of the signal until the goal is met, 4. using a signal that is ritualized or has a conventional form within a specific context, 5. awaiting a response from the receiver, 6. terminating the signal when the goal is achieved, and 7. indicating satisfaction if the goal is met or dissatisfaction if it is not met. Obviously, with our students, some of these skills may not be applicable, or may not be present consistently across all situations or contexts, (e.g., alternating eye gaze) and therefore it can be sufficient to judge communicative intent without some of these criteria being demonstrated. Each student and situation is unique.

their environment in various ways and they develop "contingency awareness"—a sense that specific actions yield specific results, and also that they can intentionally produce these results with some consistency: "Intentionality may be defined as the deliberate pursuit of a goal. Behavior is intentional if the individual has an awareness or mental representation of the desired goal, as well as the means to obtain the goal."[16] When this general principle is applied to interactions with other people, it is known as "social contingency awareness" (and later "communicative intent") and the child gradually learns that many goals and rewards can be achieved by interacting with other people in certain specific ways. Non-linguistic and pre-symbolic means dominate at this stage: vocalizations, gestures, posture, facial expressions, eye gaze, and proxemics (approach or avoidance). Through experience, learning, and imitation, these behaviors gradually develop into more stylized and conventionalized behaviors such as pointing, waving, pushing away (rejecting), clapping, etc. and various types of utterance (vocalizations, and possibly verbal approximations).

The student at the "Level 1 Emerging Communicator" stage may exhibit skills or behaviors anywhere along this continuum, and appropriate AAC strategies might include teaching various methods of: requesting reinstatement of a preferred activity, communicating refusal, signaling for attention, greeting, choice making, etc. Specific AAC tools might include: the introduction of objects as symbols (e.g., "Tangible Symbol Systems"), the introduction of pictures as symbols (e.g., Tangible Symbol Systems, the PECS system), or the introduction of single-message augmentative communication devices as signaling devices. Detailed descriptions of AAC intervention are beyond the scope of this book (although some basic suggestions that we have found valuable are included in the Appendix, p. 71).[17]

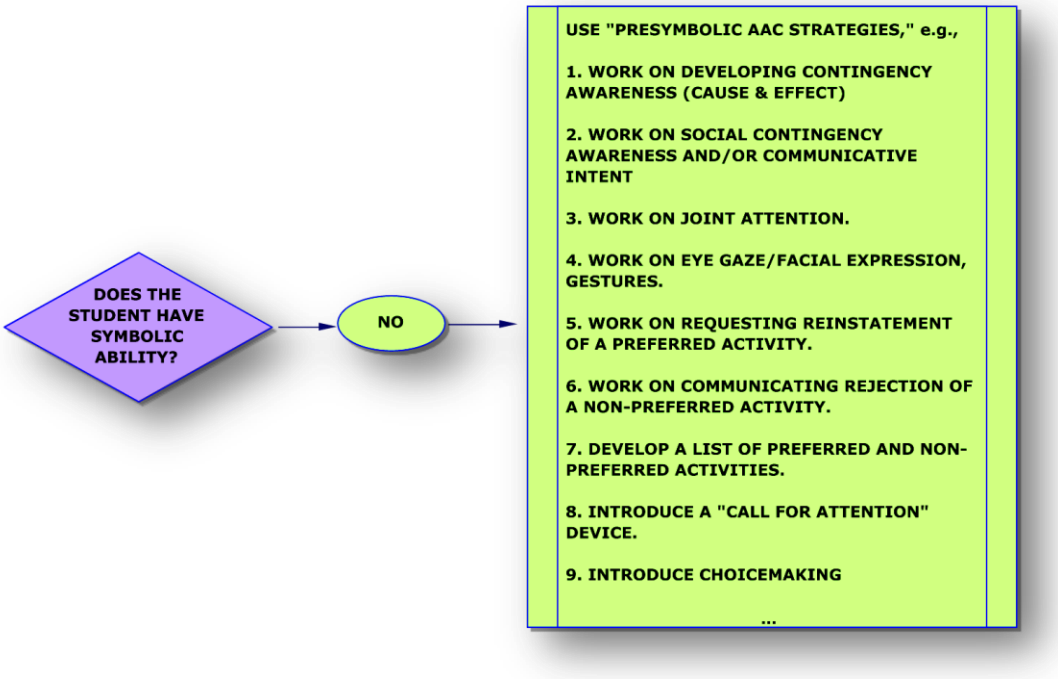

Figure 1: Level 1 Emerging Communicator—presymbolic abilities

[16] See Wetherby and Prizant, 1989.

[17] Please see the following for additional information: *Every Move Counts, Tangible Symbol Systems, First Things First, Exemplary Practices for Beginning Communicators,* and *Transitions in Prelinguistic Communication.*

LEVEL 2: BEGINNING SYMBOLIC COMMUNICATOR

If the student has achieved a very basic level of symbolic ability (somewhere between one and 50 symbols) but is not yet combining the symbols to any great extent, we would consider him/her to be a ***Level 2 Beginning Symbolic Communicator*.** Students at this level are becoming adept at requesting objects (by using symbols), choosing between several possibilities, discriminating between the symbols in simple arrays (with distractors or foils), greeting others, etc. using a single symbol for a communicative act (e.g., single word, picture, or manual sign). The student would utter a single word, choose a single picture, use a single sign, and/or activate a single icon on a speech-generating device (although the device might actually speak a short phrase in response to the single hit). Possible AAC tools or strategies at this level might include: a picture communication book or multiple-message communication board, or single or multiple message speech-generating devices (a BIGmack, a two-message Rocking Plate Communicator, a Cheap Talk 8, a SuperTalker, etc.).

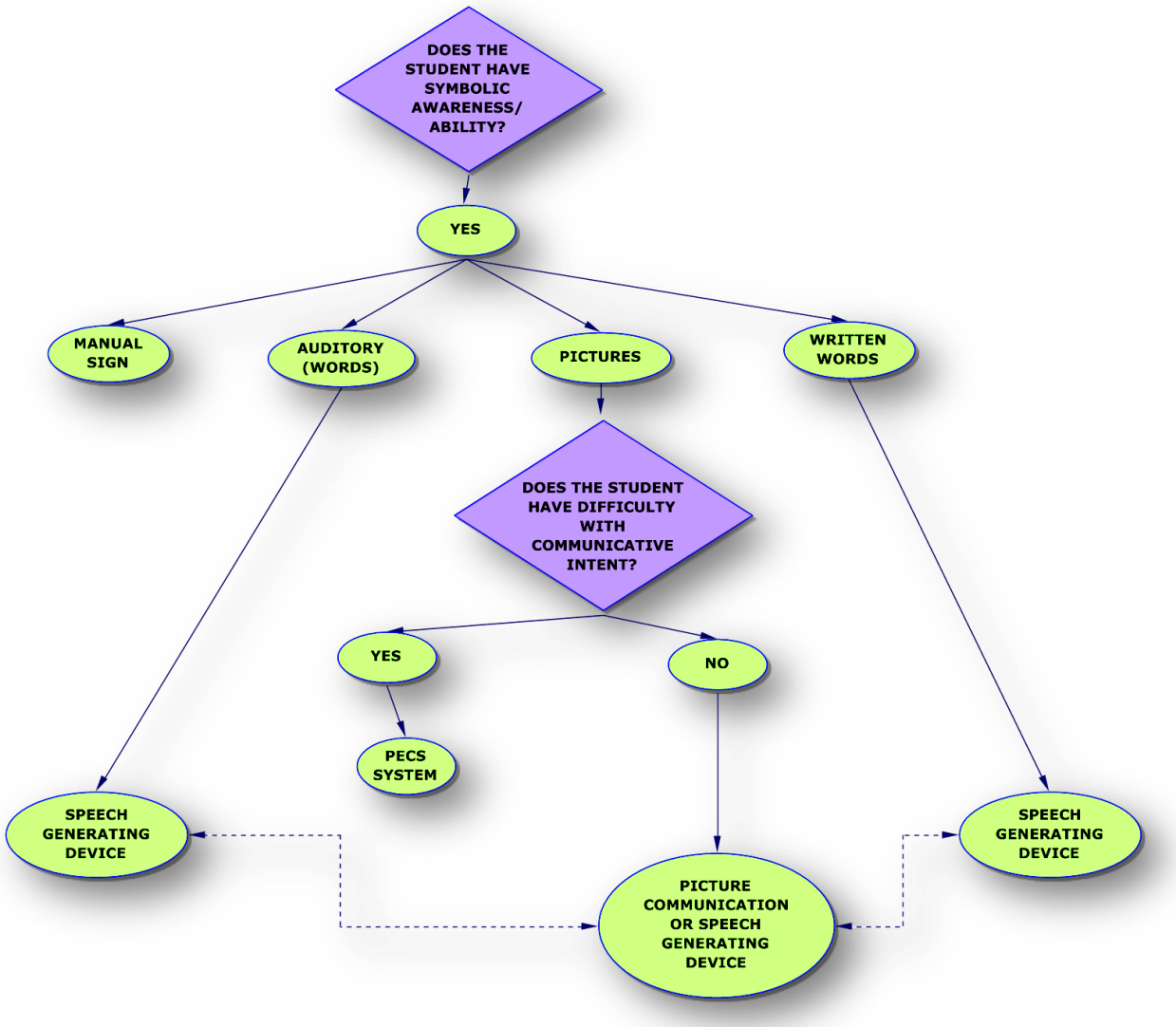

Figure 2: Level 2 Beginning Symbolic Communicator

LEVEL 3: INTERMEDIATE/CONVENTIONAL SYMBOLIC COMMUNICATOR

If the student has achieved some facility with using symbols (having between 25-50 at a minimum in his/her repertoire), combining symbols in a sequence becomes more of a realistic possibility, as does syntax, and the introduction of more complex and abstract linguistic concepts (past, future, distance) and communicative functions (comments). Use of actual pictures quickly becomes too cumbersome as communication books are "maxed out," and light tech communication devices become too limiting. At this point, dynamic screen (computerized) devices can be introduced, whether based on leveling strategies (phrase-based utterances, arranged via category), or generative language strategies (single word-based strategies, with grammar, with symbols arranged via parts of speech), or a combination of both.

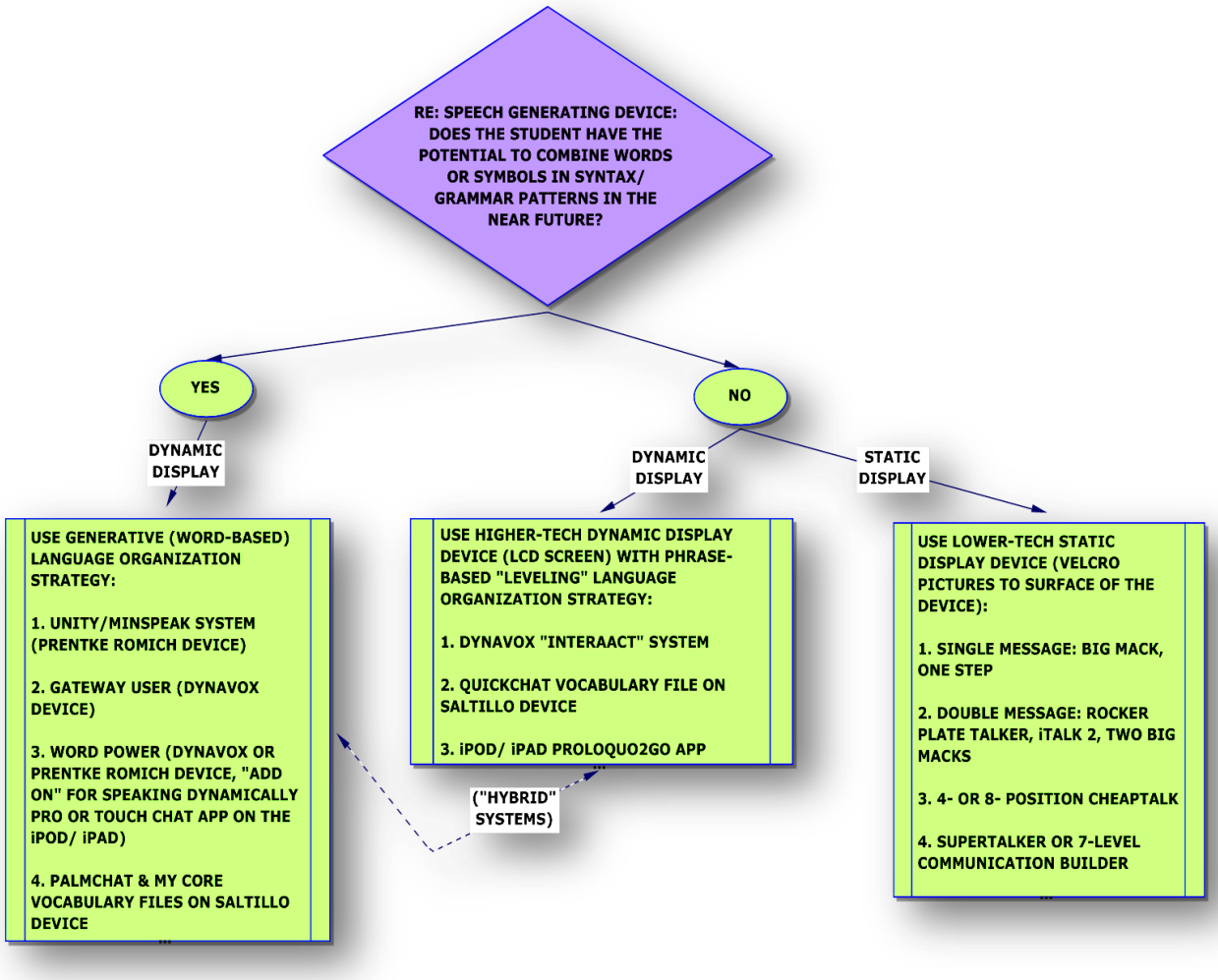

Figure 3: Level 3 Intermediate/Conventional Symbolic Communicator

APPROACHES FOR SPECIFIC STUDENTS (AND CASE STUDIES)

LEVEL 1 "Emerging Communicator" Approach

Possibilities for assessment:

- Gathering data from IEP paperwork, previous assessment reports, conferencing with caregivers and educational staff.
- Naturalistic observation—Purpose: determine student's ability to follow routines, to follow directions, to exhibit communicative intent, to engage with adults and peers.
- Elicitation Task 1—Purpose: determining preferred and non-preferred activities
- Elicitation Task 2 (semi-structured activity)—Purpose: determining the potential for using certain AAC strategies (and symbol choices) in specific contexts.
- PECS Level 1—Purpose: to stimulate communicative intent and the student's ability to initiate.

CASE STUDY:

BACKGROUND: STUDENT A is a male preschooler who communicates by means of vocalizations, gestures (clapping, body proxemics, patting a communication partner with his hand, shaking his head for refusal), eye gaze, and facial expressions. He responds to his name, understands some simple one-step directions, engages in vocal turn taking, and can clap his hands in response to verbal praise. He makes raspberry sounds and long vowel sounds in combination with "duh." He recognizes certain photographs (not line drawings) and enjoys having his favorite books read to him.

OBSERVATION: Outside in the playground STUDENT A climbed up on the wooden climbing structure and began running back and forth across the hanging bridge. He engaged briefly with several peers. An adult suggested, "Let's swing," and he responded by walking all the way across the playground to the swings. He appeared to enjoy the swings and vocalized frequently and loudly ("Ahhh, ahhh, ahhh...") during this activity. At certain points, the swing was stopped abruptly and STUDENT A was presented with a single-message communication device (a BIGmack with the message "more" programmed on it) in an attempt to get him to request the reinstatement of a preferred activity. At first he showed no interest in the device and pushed it away, but after several unsuccessful trials, and some hand-over-hand (direct physical) prompting, he pressed the device three times in succession with only verbal prompting in order to start swinging again.

SUGGESTED INITIAL STRATEGIES:

- Continue to promote "multi-modal communication" (vocalizations, gestures, eye gaze, facial expressions)
- Introduce single message speech-generating device at strategic points when he needs to communicate
- Use a picture schedule with photographs representing different activities
- Pair pictures with the voice output device (Velcro or tape the pictures to the device to represent the recorded message).

LEVEL 2 "Beginning Symbolic Communicator" Approach

Possibilities for assessment:

- Gathering data from IEP paperwork, previous assessment reports, conferencing with caregivers and educational staff.
- Naturalistic observation—Purpose: determine student's ability to follow routines, to follow directions, to exhibit communicative intent, to engage with adults and peers.
- Elicitation Task 1—Purpose: determining preferred and non-preferred activities
- Elicitation Task 2 (semi-structured activity)—Purpose: determining the potential for using certain AAC strategies (and symbol choices) in specific contexts.
- Elicitation Task 3: Symbol Preference Screening (Beukelman and Mirenda, Tangible Symbols Systems, Tablet or iPad activity)—Purpose: to determine the appropriate level of symbolization required for the student to communicate
- Elicitation Task 4: Sound Preference Screening (as appropriate)—Purpose: determine appropriate type of voice output.
- Elicitation Task 5: Fine Motor Screening (as appropriate)—Purpose: assess fine motor precision, basic sequencing skills, potential for generative language or phrase-based categorization, potential for using actual speech-generating device software.
- Elicitation Task 6: Symbol Sequencing Screening (as appropriate)—Purpose: to determine whether the student can sequence pictures into a rudimentary "syntactical" order.
- Elicitation Task 7: Leveling Approach Screening (as appropriate)—Purpose: to determine whether the student can navigate through various symbol "pages" to find a desired message.
- Elicitation Task 8: Miscellaneous Skills and Tasks (as appropriate)—Purpose: to determine whether the student has specific knowledge, skills, abilities of interest (vocabulary, memory, literacy, etc.)
- PECS—Purpose: to stimulate communicative intent and the student's ability to initiate (and to reduce the use of AAC devices as self-stimulatory "toys").

CASE STUDY:

BACKGROUND: STUDENT B is a female first grader who communicates by occasional partially-intelligible verbalizations and verbal approximations, vocalizations, gestures (e.g., pointing), occasional manual sign approximations, eye gaze, and occasional inappropriate behavior. She has a repertoire of ten word approximations and fifteen manual sign approximations. Her receptive language skills are relatively strong: she can follow one-step directions independently, and multiple step directions with repetitions and gestural prompting.

OBSERVATION: STUDENT B was observed during a group reading activity. She paid attention to the story as the teacher read it and volunteered to answer a question about the main character (she verbally replied "yes" and shook her head up and down when asked if she thought the girl was going to marry the prince). STUDENT B later joined members of the Assistive Technology Team in a separate room to try out some specific activities.

STUDENT B was shown a "Chase Me" game (designed by Children's Hospital in Boston) on a tablet-style laptop computer (with a touch screen) by one of the members of the Assistive Technology

Team. This game is designed to assess students' fine motor skills and their ability to point to, and activate, increasingly small target "buttons" on the screen. With some verbal and gestural prompting, STUDENT B was able to proceed successfully through several levels (with smaller and smaller buttons to ¾ inch) and it was evident that her fine motor abilities were sufficient for a variety of computer-based communication devices with large or small picture icons.

STUDENT B was shown a "Car2Comments"game (designed by Children's Hospital in Boston) on the tablet by one of the members of the Assistive Technology Team. This game is designed to assess students' ability to sequence three ideas to create an elementary form of "syntax' (word/concept order): "drive—big—car" or "crash—red—truck." Despite verbal, gestural, and some hand-over-hand prompting, STUDENT B was unable to sequence the three pictures in six trials of the game. It was evident from this that she was not quite ready to use symbols in a three-step sequence.

SUGGESTED INITIAL STRATEGIES:

- Continue to promote "multi-modal communication" (occasional partially-intelligible verbalizations and verbal approximations, vocalizations, gestures, occasional manual sign approximations, eye gaze).
- Introduce single message speech-generating device at strategic points when she needs to communicate (easy to program, versatile).
- Use a picture schedule with photographs representing different activities.
- Pair pictures with the voice output device (Velcro or tape the pictures to the device to represent the recorded message).
- Introduce a multiple-message speech-generating device (such as a Cheap Talk 8, a 7-Level Communication Builder, or a SuperTalker, etc.) programmed for different settings during the school day (more messages, greater range of vocabulary and communicative possibilities)

LEVEL 3 "Intermediate/Conventional Symbolic Communicator" Approach

Possibilities for assessment:

- Gathering data from IEP paperwork, previous assessment reports, conferencing with caregivers and educational staff.
- Naturalistic observation—Purpose: determining student's ability to follow routines, to follow directions, to exhibit communicative intent, to engage with adults and peers.
- Elicitation Task 1—Purpose: determining preferred and non-preferred activities
- Elicitation Task 2 (semi-structured activity)—Purpose: determining the potential for using certain AAC strategies (and symbol choices) in specific contexts.
- Elicitation Task 3: Symbol Preference Screening (Beukelman and Mirenda, Tangible Symbols Systems, tablet or iPad activity)—Purpose: to determine the appropriate level of symbolization required for the student to communicate
- Elicitation Task 4: Sound Preference Screening (as appropriate)—Purpose: to determine appropriate type of voice output.

- Elicitation Task 5: Fine Motor Screening (as appropriate)—Purpose: to assess fine motor precision, basic sequencing skills, potential for generative language or phrase-based categorization, potential for using actual speech-generating device software.
- Elicitation Task 6: Symbol Sequencing Screening (as appropriate)—Purpose: to determine whether the student can sequence pictures into a rudimentary "syntactical" order.
- Elicitation Task 7: Leveling Approach Screening (as appropriate)—Purpose: to determine whether the student can navigate through various symbol "pages" to find a desired message.
- Elicitation Task 8: Miscellaneous Skills and Tasks (as appropriate)—Purpose: to determine whether the student has specific knowledge, skills, abilities of interest (vocabulary, memory, literacy, etc.)
- PECS—Purpose: to stimulate communicative intent and the student's ability to initiate (and to reduce the use of AAC devices as self-stimulatory "toys").

CASE STUDY:

BACKGROUND: STUDENT C is an eighth grade student who communicates by largely-unintelligible multiple-word verbal approximations, vocalizations, gestures, occasional manual sign approximations, facial expressions, eye gaze, and occasional aggressive and self-injurious behavior (when his message is not understood). His receptive language is good: he can follow two and three step unfamiliar directions with mild verbal prompting (when he is motivated to do so). He has been using a SuperTalker in the classroom and understands the concept of using it as a means to communicate in situations where his message is not being understood.

OBSERVATION: STUDENT C was shown a "Chase Me" game (designed by Children's Hospital in Boston) on a tablet-style laptop computer (with a touch screen) by one of the members of the Assistive Technology Team. This game is designed to assess students' fine motor skills and their ability to point to, and activate, increasingly small target "buttons" on the screen. With some verbal and gestural prompting, STUDENT C was able to proceed successfully through several levels (with smaller and smaller buttons to ¾ inch) and it was evident that his fine motor abilities are sufficient for a variety of computer-based communication devices with large or small picture icons.

STUDENT C was shown a "Car2Comments"game (designed by Children's Hospital in Boston) on the tablet computer. This game is designed to assess students' ability to sequence three ideas to create an elementary form of "syntax' (word/concept order): "drive—big—car" or "crash—red—truck." With some minimal verbal and gestural prompting, he was able to create 3-4 sequences to receive the animated activity "reward."

STUDENT C was then shown actual communication device software called DynaVox Gateway—40 on the tablet computer. This software enables students to generate their own sentences word-by-word: "I like candy" or "I go home." After some initial demonstration and verbal/gestural prompting STUDENT C was able to create approximately a half-dozen new sentences with the "I like…" and "I go…" carrier phrases.

SUGGESTED INITIAL STRATEGIES:

- Continue to promote "multi-modal communication" (verbal approximations, vocalizations, gestures, occasional manual sign approximations, facial expressions, and eye gaze).

- Introduce multiple-message speech-generating device with word-based generative language capability (such as a Maestro or T-10 with the "Gateway" user, a PRC Vantage Lite or Accent, or a Saltillo ALT-Chat Plus or NOVA chat) but also with the capacity to produce quick, phrase-based utterances for occasions when rapid communication is necessary (i.e., when his message is not understood and he is becoming agitated).

A BRIEF DISCUSSION ABOUT AAC ADOPTION VS. ABANDONMENT

Caregivers and teachers can help foster the student's communicative competence with AAC in any situation that the student encounters. It is an unfortunate fact, though, that despite everyone's best intentions, AAC is abandoned at an alarmingly high rate. What accounts for this? According to teachers and staff, lack of training, time constraints, technical problems, and lack of support are some of the primary reasons. Time is extremely precious in the classroom and not many can devote the necessary time and prep work for customizing a system for each student in the class, and troubleshooting a system that goes down for whatever reason.

For students, the pressure to fit in with peers and not be singled out as "different" or "disabled" can be a truly significant deterrent. One student who had his own custom-programmed state-of-the art AAC device never brought it to school, and in fact hid it under his bed to try to prevent his mother from sending it in with him each day! This is perhaps a dramatic example, but we see it to varying degrees with many other students as well. Another deterrent might be if the system is a poor fit for the student's needs. If the messages that are available are not something that the student wants to communicate, or if communication partners do not understand his/her message correctly, s/he will become frustrated and abandon the AAC. In addition, if the system is too difficult for the student to understand (e.g., if the student is at a pre-symbolic cause/effect level and the system calls for generating complete sentences), or if s/he cannot operate the system quickly enough to produce a usable message, s/he will also become frustrated and not use the system.

It is evident that there are a number of factors—perhaps some of them "intangible" or at least not immediately obvious--that play into the adoption/abandonment equation. Ultimately, the wisest course of action is simply to make an initial choice, informed by all of the data we have from our AAC Evaluation and our knowledge of the other potential stakeholders: the school team, peers, family, and community. As we closely monitor the situation over time, the strengths and weaknesses of the strategy become obvious. Does the system match the student's communication needs, and the ability of the other stakeholders (school team and family) to support it? If things are not working out as planned, is it because of a lack of training, or is the system frustrating in some way for our student? These are some of the crucial questions to consider.

The chart below outlines some important stakeholder characteristics that might lead to the successful adoption of an AT (or AAC) system or strategy. From the chart, we can appreciate that <u>all</u> AAC

stakeholders need to be involved in substantial ways: the AAC user, his/her family, the school team, the assistive technology specialists, private therapists, the developers, etc.

	User	Caregivers	A.T Specialists	Developers
Characteristics of successful adoption	Desires change in what s/he can do Self-disciplined and has a high frustration tolerance Proud to use the device. Willing to incorporate tool into daily routine	Able to put forth effort required to learn to use and personalize the tool. Support the user in using the new tool. Welcome changes that use of the tool brings to the social dynamic. Understand the customization is not a "one shot deal" and may need to continue throughout the technology's life.	Extensive knowledge of assistive technology. Willingness to learn about new tools coming out on the market. Facilitate a process which is collaborative rather than directive. Offer training and support both in programming and integration. Sensitivity to family values and cultural differences.	Comprehensive understanding of functional limitations. Develop customizable tools. Develop tools which are simple to set up. Develop tools which are durable. Allow for customer's aesthetic preferences. Support users with technical support and short repair times.

Participant characteristics of successful AT adoption. (from Kintsch & Depaula, 2002)

"Buy in" and commitment from all parties is essential! Without it, we are much more likely to be unsuccessful with our efforts: a strategy or system may be effective in one setting, but totally inappropriate for another. That said, there is nothing wrong with using different strategies in different settings—again: "think multimodal!" But, it would be ideal if the student's primary means of communication, his/her "primary voice," could be versatile and robust, and easily transferable between settings. This is much more likely IF the assessment and AAC determination process has been performed effectively, and IF all stakeholders have been actively involved in the process.

BIBLIOGRAPHY

Bates, E., Thal, D., & Janowsky, J. S. (1992). Early language development and its neural correlates. *Handbook of neuropsychology*, *7*, 69-69.

Bean, I. (2011). Switch Progression Road Map. Delph, UK: Inclusive Technology Ltd. Retrieved from: http://www.inclusive.co.uk/publications

Beukelman, D.R., & Mirenda, P. (2005). Augmentative and Alternative Communication: Supporting Children and Adults with Complex Communication Needs (Third Edition). Baltimore, MD: Paul H. Brookes.

Bogart, R., & Visvader, P. (2009). "GOT SWITCH, WHAT'S NEXT?" Establishing Switch Access, Assessing Cognition and Communication, and Implementing a Training Curriculum for Individuals Who Use Switches. Retrieved from: www.swaaac.com/Files/FormsandDocuments/SWITCHBOOK.pdf

Brady, N. C., McLean, J. E., McLean, L. K., & Johnston, S. (1995). Initiation and repair of intentional communication acts by adults with severe to profound cognitive disabilities. *Journal of Speech, Language, and Hearing Research*, *38*(6), 1334-1348.

Browder, D. M. (1991). *Assessment of individuals with severe disabilities: An applied behavior approach to life skills assessment*. Baltimore: Brookes.

Camaioni, L. (1992). Mind knowledge in infancy: The emergence of intentional communication. *Early Development and Parenting*, *1*(1), 15-22.

Camaioni, L. (1993). The development of intentional communication: A re-analysis. *New perspectives in early communicative development*, 82-96.

Carter, M., & Iacono, T. (2002). Professional judgments of the intentionality of communicative acts. *Augmentative and Alternative Communication*, *18*(3), 177-191.

Cress, C. J., & Marvin, C. A. (2003). Common questions about AAC services in early intervention. *Augmentative and Alternative Communication*, *19*(4), 254-272.

Downing, J.E. (1999). Teaching Communication Skills to Students with Severe Disabilities. Baltimore: Paul H. Brookes.

Drager, K. D., Light, J. C., Speltz, J. C., Fallon, K. A., & Jeffries, L. Z. (2003). The performance of typically developing 2 1/2-year-olds on dynamic display AAC technologies with different system layouts and language organizations. *Journal of Speech, Language, and Hearing Research*, *46*(2), 298-312.

Drager, K. D., Light, J. C., Carlson, R., D'Silva, K., Larsson, B., Pitkin, L., & Stopper, G. (2004). Learning of Dynamic Display AAC Technologies by Typically Developing 3-Year-Olds: Effect of Different Layouts and Menu Approaches. *Journal of Speech, Language, and Hearing Research*, *47*(5), 1133-1148.

Frost, L., & McGowan, J. S. (2011). Strategies for transitioning from PECS to SGD. Part I: Overview and device selection. *SIG 12 Perspectives on Augmentative and Alternative Communication*, *20*(4), 114-118.

Frost, L., & McGowan, J. S. (2012). Strategies for Transitioning From PECS to SGD. Part 2: Maintaining Communication Competency. *SIG 12 Perspectives on Augmentative and Alternative Communication*, *21*(1), 3-10.

Gleason, J. B. (1993). The development of language (Third Edition). New York: Macmillan.

Iacono, T., Carter, M., & Hook, J. (1998). Identification of intentional communication in students with severe and multiple disabilities. *Augmentative and Alternative Communication*, *14*(2), 102-114.

Kangas, K., & Lloyd, L. (1988). Early cognitive skills as prerequisites to augmentative and alternative communication use: What are we waiting for? *Augmentative and Alternative Communication, 4*(4), 211-221.

Kennedy, C. H., & Haring, T. G. (1993). Teaching choice making during social interactions to students with profound multiple disabilities. *Journal of Applied Behavior Analysis*, *26*(1), 63-76.

Light, J., & Lindsay, P. (1991). Cognitive science and augmentative and alternative communication. *Augmentative and alternative communication*, *7*(3), 186-203.

Light, J., Drager, K., McCarthy, J., Mellott, S., Millar, D., Parrish, C., Parsons, A., Rhoads, S., Ward, M., & Welliver, M. (2004). Performance of typically developing four-and five-year-old children with AAC systems using different language organization techniques. *Augmentative and Alternative Communication*, *20*(2), 63-88.

Loncke, F. T., Campbell, J., England, A. M., & Haley, T. (2006). Multimodality: A basis for augmentative and alternative communication-psycholinguistic, cognitive, and clinical/educational aspects. *Disability & Rehabilitation*, *28*(3), 169-174.

Mar, H. H., & Sall, N. (1999). Profiles of the Expressive Communication Skills of Children and Adolescents with Severe Cognitive Disabilities. *Education and Training in Mental Retardation and Developmental Disabilities*, *34*(1), 77-89.

McLean, J. E., McLean, L. K., Brady, N. C., & Etter, R. (1991). Communication profiles of two types of gesture using nonverbal persons with severe to profound mental retardation. *Journal of Speech, Language, and Hearing Research*, *34*(2), 294-308.

Nation, J. E., & Aram, D. M. (1991). *Diagnosis of speech and language disorders (Second Edition)*. San Diego, CA: Singular Publishing.

Orelove, F. P., Sobsey, D., & Silberman, R. K. (1996). *Educating children with multiple disabilities: A transdisciplinary approach (Third Edition)*. Baltimore: Paul H. Brookes.

Owens, R. E. (1990). Development of communication, language, and speech. *Human communication disorders: an introduction.* NY*:* Macmillan, 36-81.

Ratcliff, A. (1994). Comparison of relative demands implicated in direct selection and scanning: Considerations from normal children. *Augmentative and Alternative Communication*, *10*(2), 67-74.

Reichle, J., Beukelman, D. R., & Light, J. C. L. (Eds.). (2002). *Exemplary practices for beginning communicators: Implications for AAC*. Baltimore: Paul H. Brookes.

Reed, V.A. (1994). An Introduction to Children with Language Disorders (Second Edition). NY: Macmillan.

Rowland, C. (2005). But what can they do? Assessment of communication skills in children with severe and multiple disabilities. *SIG 12 Perspectives on Augmentative and Alternative Communication*, *14*(1), 7-12.

Rowland, C., Schweigert, P. D., Light, J. C., Beukelman, D. R., & Reichle, J. (2003). Cognitive skills and AAC. *Communicative competence for individuals who use AAC: From research to effective practice*, 241-275.

Rowland, C., & Schweigert, P. (1993). *The early communication process using microswitch technology*. Tucson: Communication Skill Builders.

Rowland, C., & Schweigert, P. (2000). *Tangible Symbol Systems: Making the right to communicate a reality for individuals with severe disabilities*. Portland: OHSU Design to Learn.

Rowland, C., & Schweigert, P. (2004). *First things first: Early communication for the pre-symbolic child with severe disabilities*. Portland: Oregon Health & Science University.

Schlosser, R. W. (Ed.). (2003). *The efficacy of augmentative and alternative communication*. Amsterdam: Elsevier.

Smith, D. D., & Luckasson, R. (1995). *Introduction to special education: Teaching in an age of challenge*. Boston: Allyn and Bacon.

Snell, M. E., & Brown, F. (2000). *Instruction of students with severe disabilities (Fifth Edition)*. Upper Saddle River, NJ: Prentice-Hall.

Wetherby, A. M., & Prizant, B. M. (1989). The expression of communicative intent: Assessment guidelines. *Seminars in Speech and Language*, *10(*1), 77-91.

Wetherby, A. M., Warren, S. F., & Reichle, J. (1998). *Transitions in prelinguistic communication* (Vol. 7). Baltimore: Paul H Brookes.

Woolfolk, A.E. (1995). Educational Psychology (Sixth Edition). Boston: Allyn & Bacon.

Assessments, Tools, Additional Resources

Brady, N., Fleming, K., Thiemann-Bourque, K., Saunders, M., Olswang, L., & Dowden, P. (in press). Communications Complexity Scale.

Bruno, J. Test of Aided-Communication Symbol Performance (TASP). www.mayer-johnson.com/TASP

Huer, M.B. (2011). TECEL: Test of Early Communication and Emerging Language. Austin, TX: Pro-ed. (this is a revision of the Nonspeech Test for Receptive and Expressive Language)

Jackson, L. (1996). A Manual for Assessing and Analyzing Communication Capabilities and Communication Needs. Greeley, CO: University of Northern Colorado.

Korsten, J.E., Foss, T.V., & Berry, L.M. (2007). Every Move Counts--Clicks and Chats; Sensory-Based Approach: Communication and Assistive Technology. EMC Inc.

Kovach, T.M. (2009). Augmentative & Alternative Communication Profile. East Moline, IL: Linguisystems.

Mar, H.H., & Sall, N. (1999). Dimensions of Communication. Patterson, NJ: St. Joseph's Children's Hospital.

Rowland, C., & Schweigert, P. (2000). "Communication Matrix Profile" and various charts from Communication Development and Teaching Strategies for Children with Severe and Multiple Disabilities. Portland, OR: Tangible Symbol Systems. www.designtolearn.com

Stillman, R. (1978). The Callier-Azusa Scale (G Edition). Dallas, TX: The University of Texas at Dallas.

Stillman, R., & Battle, C. (1985). Callier-Azusa Scale H: Scale for the Assessment of Communicative Abilities. Dallas, TX: The University of Texas at Dallas.

Weissling, K. S., & Beukelman, D. R. (2006). Visual scenes displays: Low-tech options. *SIG 12 Perspectives on Augmentative and Alternative Communication*, *15*(4), 15-17.

Wetherby, A. & Prizant, B. (1993). Communication and Symbolic Behavior Scales-Normed Edition. Chicago, IL: Applied Symbolix. http://www.brookespublishing.com/

Wisconsin Assistive Technology Initiative. (2004) The W.A.T.I. Assessment Package. http://www.wati.org/content/supports/free/pdf/WATI%20Assessment.pdf

WEB LINKS

- AAC Device Manufacturer List: http://aac.unl.edu/AACVI1.html
- AAC-RERC (AAC Rehabilitation Engineering Research Center) http://aac-rerc.psu.edu/
- AAC Tech Connect: http://www.aactechconnect.com
- AbleNet: www.ablenetinc.com
- American Speech-Language-Hearing Association (ASHA): http://www.asha.org/default.htm
- AssistiveWare (AAC iPad apps): http://www.assistiveware.com/
- Augmentative and Alternative Communication Center: http://aac.unl.edu/
- Boston Children's Hospital AAC-based PowerPoint Activities: http://www.childrenshospital.org/centers-and-services/programs/a-_-e/augmentative-communication-program/downloads
- Carole Zangari's website: http://praacticalaac.org/author/carole-zangari/
- Colorado Speech-Language-Hearing Association (CSHA): http://www.cshassoc.org/
- Colorado SWAAAC website: http://www.swaaac.com/
- Design to Learn (Tangible Symbol Systems and Communication Matrix): http://www.designtolearn.com/
- Don Johnston: www.donjohnston.com
- DynaVox: http://www.dynavoxtech.com/
- Enabling Devices: www.enablingdevices.com
- Ian Bean's Website: http://www.ianbean.co.uk/
- Inclusive TLC (ChooseIt! Maker): http://www.chooseitmaker3.com/
- The International Society for Augmentative and Alternative Communication (ISAAC) http://www.isaac-online.org/english/home
- Lauren Enders on Pinterest: https://www.pinterest.com/lasenders/
- Priory Woods (cause & effect software): www.priorywoods.middlesbrough.sch.uk
- Pyramid Educational Consultants (the Picture Exchange Communication System--PECS) http://www.pecs.com/
- Prentke Romich: http://www.prentrom.com/
- Saltillo: http://saltillo.com/
- SENSwitcher programs: http://www.northerngrid.org/resource/sen-switcher
- Simplified Technology (Linda Burkhardt): http://www.lburkhart.com/
- Silver Kite (apps for iPad): http://www.silver-kite.com/
- Tobii ATI: www.tobii.com
- Widgit: www.widgit.com
- YAACK website (intro to AAC): http://aac.unl.edu/yaack/

APPENDIX

AAC TOOLBOX (A DISCUSSION OF SPECIFIC POSSIBILITIES)

LOW TECH:

- ***Tangible Symbol Systems*** (Rowland & Schweigert, 2000) is a method of communication that uses concrete, rather than abstract symbols. Tangible symbols are objects or pictures that stand for (or represent) something about which a student needs to communicate. Tangible symbols may be whole objects, parts of objects, associated objects, textures or shapes, line drawings, or photographs. Tangible symbols are "permanent" (they exist in a permanent display and don't have to be recalled from memory), and may be manipulated by both the user and the communication partner. The symbol should be based on the user's own experience so that the relationship between the symbol and its referent is clear and understandable.

- ***Picture communication*** strategies typically begin with teaching the student to associate a picture (photo, or line drawing) with a specific preferred activity or object. The student indicates in some way (by pointing, grasping and giving, using gesture or eye gaze, etc.) the desire for the object or activity, which is then provided. Once this general pattern has been learned, the student then learns to distinguish between the different pictures, usually by pairing a preferred activity with a "foil" or non-preferred activity. If the student chooses the preferred activity, s/he receives the reward. If the student chooses the foil, s/he is offered the non-preferred activity, and is thus given a powerful incentive to learn to distinguish between the pictures correctly. Having the facilitator randomly switch picture positions (right to left, left to right) helps to avoid position bias (e.g., always choosing the picture on the left side). Presented pictures choices can increase from a field of one or two on up to an entire ***communication board*** or ***communication book*** with dozens of possible choices, arranged (typically) in terms of category. An example of a formalized picture communication system is the popular "PECS" (Picture Exchange Communication) system of Frost and Bondy.

- ***The Picture Exchange Communication System (PECS)--***The PECS system begins with teaching students to exchange a picture of a desired item with a facilitator, who immediately honors the request. If they want food, they give a picture of food to the facilitator who gives them the food. In order to encourage students' spontaneous communicative intent and avoid prompt dependency, verbal prompts are not used during the initial stages of the training process. The PECS system progresses through six phases, step-by-step, through the initial stage of requesting (one picture, one object or activity) through choice-making (multiple pictures, multiple objects or activities), and eventually to stringing together several pictures into a rudimentary syntax ("I want cookie please"). The PECS system is intricate and formal (facilitators attend multiple-day workshops and are guided by a lengthy manual) and it is ideally suited to foster communication in individuals with autism, and others who have challenges with communicative intent.

LIGHT TECH:

- A ***single-message speech-generating device*** such as a "BIGmack" or "One Step" with a ***static display***--these are versatile and can be used in many different situations; they are quick-to-program and use ***digitized*** speech (you record a verbal message); and they can easily be fitted with pictures (photos or Boardmaker picture symbols) Velcroed onto the device.

- A ***two message speech-generating device*** such as a "Rocking Plate Talker" or "iTalk2" with a ***static display***—these are versatile and allow for the possibility of choice-making or a sequenced message of some kind; they are quick-to-program and use ***digitized*** speech (you record verbal messages); and they can be easily "fitted" with pictures (photos or Boardmaker picture symbols) Velcroed onto the device.

- A ***wearable message recording device*** such as a "Hip Talk" (a message recording device that can be worn around the waist like a "fanny pack") with a ***static display***—these are versatile and very portable and can be used in many different situations. They are relatively easy to program, use ***digitized*** speech (you record verbal messages) and they can be easily "fitted" with pictures (photos or Boardmaker picture symbols) Velcroed onto the device.

- A ***single button message sequencing device*** (***digital*** speech—the actual human voice) with a ***static display*** such as a "Step-by-Step." This type of device offers the possibility of sequencing a message: telling a joke, singing a song, relating a longer narrative or parts in a play, etc.

- A ***multiple-message (single level) voice output device*** with a ***static display*** such as a Cheap Talk-4 or Cheap Talk-8 (using digital speech—the actual human voice). These devices have a relatively limited range, but they are quick and easy to program and extremely versatile. They can be easily "fitted" with pictures (photos or Boardmaker picture symbols) Velcroed onto the device.

- A ***multiple-message (multiple level) voice output device*** with a ***static display*** such as a 7-Level Communication Builder or SuperTalker (using ***digital*** speech—the actual human voice). These devices have a relatively limited range, but they are quick and easy to program and extremely versatile. They have multiple levels (or pages) that can be programmed with 1, 2, 4, 8, (or 16, with the 7-level) messages. They can also be easily "fitted" with pictures (photos or Boardmaker picture symbols) Velcroed onto the device.

HIGH TECH:

- A computerized, voice output device with a ***dynamic display*** (an LCD touch screen) and ***digitized*** (recorded) speech such as an M3. The M3 is made by the DynaVox company and it uses a "leveling" approach to organizing vocabulary: you press one button and a whole phrase or sentence like "I need to go to the bathroom" will be spoken. Hit another button, say for "school" and another page or level opens up. Once one navigates to the proper level (levels are usually organized by category), the total message is related quickly.

- A computerized, voice output device with a ***dynamic display*** (an LCD touch screen) such as a NOVA chat (Saltillo), a Maestro or T-10 (DynaVox), an Accent, a Vantage Lite, or an ECO2 (Prentke

Romich). These high-end devices have communication software which features high-quality ***synthesized*** speech (computer voices) and the possibility of accommodating communicators at different skill levels, from beginner to advanced. Although all of these devices are extremely versatile, several devices (e.g., the DynaVox models) primarily emphasize a ***phrase-based leveling*** or ***visual scene*** approach, whereas others (e.g., the Prentke Romich models) primarily emphasize a ***word-based*** or ***generative language*** approach.[18]

- A computerized ***text-to-voice*** device with a dynamic screen (an LCD touch screen) such as a DynaWrite (DynaVox) or a Lightwriter (Toby Churchill) or else less expensive voice output portable word processors such as the Fusion or Forte (Writer Learning Systems) or the Neo (Renaissance Learning). There are text-to-voice features on most of the high-tech AAC devices as well, so that printed text can be combined with pictures/icons, as needed.

- Computerized, voice output ***AAC apps loaded onto the iPhone or iPad***. This type of system is the latest for portability and functionality and there are various AAC apps which can accommodate leveling (e.g., Proloquo2Go), generative language (Sono Flex or the WordPower add-on app to the Touch Chat suite), or text-to-speech strategies (SpeakPad, Speak It!, Speak It To Me, Speak Bot, Write&Say, iSayIt, iSpeakIt, Voice Generator, etc.). There are hundreds of AAC apps available as of this writing, with additional ones being added every day

With apps featuring the "leveling" approach to organizing vocabulary you press one button and a whole phrase or sentence like "I need to go to the bathroom" will be spoken. Hit another button, say for "school" and another page or level opens up. Once one navigates to the proper level (levels are usually organized by category), the total message is related quickly. You can usually customize the software very easily to accommodate communicators at different skill levels, from beginner to advanced.

With apps featuring the "generative language" strategy to organizing vocabulary, you build up sentences word-by-word by pressing the appropriate pictures/icons (usually organized in terms of parts of speech). Apps which feature this approach usually have accommodations for communicators at various skill levels, from beginner to advanced.

With AAC apps which feature sequenced messages (pictures and voice output), you can relate stories, tell jokes, give instructions, take conversational turns, give class presentations, etc. Some possibilities include: Pictello and TapSpeak Sequence.

• *A BRIEF DISCUSSION ABOUT USING iPADS AS AAC DEVICES*

For the brief period of time that mobile devices such as iPads, iTouches, and iPhones ("iDevices") have been available they have proven to be amazingly popular items, and have quickly become useful and effective tools for education, entertainment, AND communication. Communicating

[18] The lines have blurred significantly, especially in recent years, as the DynaVox devices also feature easy access to the "Gateway" User Areas (very much word-based and generative), and the Prentke Romich Unity-based devices allow for phrase-based statements.

with others via the iPhone and the Internet are obvious functions, and, for students with complex communication needs, there are now a large number of powerful AAC apps available that transform the iDevice into a Speech-Generating AAC device. Advantages of using iDevices as AAC tools are obvious:

- Low price (less than $1000).
- iDevices are multi-purpose tools: there are many apps to choose from.
- iDevices can easily access the internet.
- iDevices have a "coolness" factor for students, and give instant peer acceptance.
- iDevices have a digital camera.
- iDevices are extremely portable and elegant.

As with any other AAC strategy we have considered, one size does NOT fit all, and despite their instant and undeniable appeal, iPads will not be an appropriate choice for all students in all situations. "It all depends." Some disadvantages to consider...

Physical access can be a significant problem for some students—is s/he able to isolate finger motions? Is s/he able to swipe or pinch? Can s/he see what is on the screen? The situation is improving considerably with newly marketed switch interfaces and apps designed for scanning, but at this point, it is still a significant consideration. Another question would be whether the student understands what a picture represents or whether s/he can comprehend synthesized speech (a computer voice). In addition, iPad apps are generally not as complex and "robust" as fully-functional AAC software, so that a student might be poorly served by a relatively simple iPad app when s/he might really need the power and capability of a DynaVox or PRC or Saltillo (or other) device.

A final disadvantage might actually be one of the already-listed advantages: multi-functionality and versatility. Traditional dedicated speech-generating devices have always had the communication software as their main function and purpose. You get a NOVA chat or a T-10, and you are not going to make phone calls with it or surf the web. Even with the tablet-based devices such as the Prentke Romich ECO2 or the DynaVox Maestro, it is difficult or at least awkward to close down the communication software and use them as anything other than what they were sold as: dedicated speech-generating AAC devices. This is not the case with the iPad. It is just as easy (and perhaps easier and even more desirable?) to boot up a fun game such as Angry Birds as it is to open up Proloquo2Go or Touch Chat or one of the other AAC apps. The difficulty now becomes one of distractibility – is the iPad an AAC device (a "voice prosthesis" to help the student communicate), an educational tool, a toy, or all of the above? Why should the student want to boot up an AAC app when Angry Birds is more fun? Should we close off ALL other apps except the AAC app of choice so that we have a "dedicated" speech-generating device? (This type of lock-out is possible with the "Guided Access" feature in the most recent iOS systems: Settings > General > Accessibility > Guided Access) Or will this type of approach be counter-productive, spoil the multifunctional appeal of the iPad, and ignore its "insanely great" power and versatility? A recent informal email poll of about a dozen international AAC experts produced answers across the spectrum: a few suggested that the iPad, if used as an AAC device, should be a DEDICATED device—close off all other apps as distractions (or else have TWO iPads with different color cases—one for educational/entertainment purposes, and one for JUST communication). Others responded that there should be NO restrictions—a tool is a tool is a tool and why deny the power and range of the iPad's full

capability? Finally, several of the responses held to a middle ground of sorts: **"it all depends."** It all depends on the student (whether s/he is distractible), the context, the communication partners, and the overall goals—the who, what, when where, how, and WHY of the situation. Ultimately, iPads and apps are TOOLS ("cool gizmos," but tools, nevertheless). Some basic questions that might prove useful:

- What is it that you want the student using the iDevice to do, learn, examine, discuss, and think about? (What do you want the iDevice and app to do?)
- Create a list of what you want to do **first** so that the extra bells and whistles are not a distraction.
- How will the technology help to accomplish the student's communication goals?
- Do the features meet the needs of the student?
- Do the iDevice features work in this environment?
- Does the iDevice address the tasks that the student is expected to perform?
- Does this tool align with curriculum, teaching methods, IEP goals, etc.?

ASSISTIVE TECHNOLOGY TEAM REFERRAL: Communication Evaluation

What do you hope the student will be able to do as a result of this evaluation? Which IEP goals will be addressed?

_____

_____

_____

_____

_____ _____ _____

Legal Name of Child/Student **Date of Birth** **Current Date**

_____ _____ _____

School **Grade** **Case Manager**

- **<u>Instructions to case manager</u>:**

  Please send (or scan and email):

  1) *The completed referral form with school team and parent signatures (don't forget to fill out the relevant parts of the "Notice Regarding Reevaluation" on page 6)*
  2) *A copy of the student's current IEP, and*
  3) *Any relevant evaluation reports (hospital, clinic, specialist) to: XXXX*

  As soon as all paperwork is received, an evaluation can be scheduled. Evaluations usually take about an hour and a half and consist of consultation with school staff and parents followed by observation/assessment of the student.

- **<u>Instructions to parents:</u>**

  1) *Please fill out page entitled "To be Completed by Parents"*
  2) *Please fill out and sign the relevant parts of the "Notice Regarding Reevaluation" page and return all these to the case manager*

  Please note: the "Parent and Child Rights in Special Education Procedural Safeguards Notice" booklet can be found at:

http://www.cde.state.co.us/sites/default/files/documents/spedlaw/download/2011proceduralsafeguards.pdf

and in Spanish at:
http://www.cde.state.co.us/sites/default/files/documents/spedlaw/download/2011proceduralsafeguards-spanish.pdf

ASSISTIVE TECHNOLOGY TEAM REFERRAL: Communication Evaluation

School Specialists:

NAME:	***SIGNATURE:***
Special education teacher:	
Speech therapist:	
Occupational therapist:	
Physical therapist:	
Classroom teacher(s):	
Other:	

Student Communication Profile

Student currently communicates via:

- *Voice/speech. Quality:*
  - *Clear*
  - *Sometimes difficult to understand*
  - *Usually difficult to understand*
- *Vocalizations – describe:*
- *Sign language – describe:*
- *Gestures – describe:*
- *Pointing*
- *Eye gaze*
- *Communication book:*
  - *Photographs*
  - *Drawings*
  - *Objects*
  - *Words*

ASSISTIVE TECHNOLOGY TEAM REFERRAL: Communication Evaluation

- ❑ *High tech system (i.e., device) Which one?*
  _____

- ❑ *Clear way to indicate "Yes" and "No"? Please describe:*

Is it difficult for familiar people to understand the student's basic needs?

❑ *Yes* ❑ *No* ❑ *Sometimes* *Please explain:*

Does the student understand more than he/she is able to express?

❑ *Yes* ❑ *No* ❑ *Sometimes* *Please explain:*

What communication methods have been tried?

What would you like to see this student be able to do?

Student Learning Profile

Writing
Concerns with writing:

Reading
Concerns with reading skills:

Math
Concerns with math skills:

Additional comments:

ASSISTIVE TECHNOLOGY TEAM REFERRAL: Communication Evaluation

Access

Computer access at School:

- *Macintosh*
- *Windows*
- *Other _____*

Does the student use adapted switches?

- *Yes*
- *No*

If yes, please comment on number and position of switches, and types of switch activities (e.g., cause and effect, choice making, scanning, environmental control, communication device, etc.):

Student Physical Access & Sensory Profile

Does the student have physical limitations that impact learning ability?

- *Yes*
- *No*

Student vision:

Student hearing:

If yes, please check any of the following that apply:

- *Uses a wheelchair*
  - *Electric*
  - *Manual*
- *Does not have accurate reach*
- *Does not have accurate point*
- *Cannot isolate finger movements*
- *Tremors*
- *Motor impairments that interfere with accessing mobile device, adapted switch, writing, typing (please describe):*

- *Other (please describe):*

What other things have been tried or are being used to help the student overcome physical limitations in order to effectively learn and communicate?

ASSISTIVE TECHNOLOGY TEAM REFERRAL: Communication Evaluation

To be Completed by Parents:

General
What skills do you believe are important for your child to develop?

Are there significant factors about your child's strengths, learning style, coping strategies, or interests that the team should consider?

Are there any other significant factors about your child that the team should consider?

Student computer access at home:

- ❑ *Macintosh*
- ❑ *Windows*
- ❑ *Other _____*

Does your child receive outside therapies? *(Check all that apply)*

- ❑ *Speech/Language*
- ❑ *Occupational Therapy*
- ❑ *Physical Therapy*
- ❑ *Vision*
- ❑ *Hearing*
- ❑ *Psychologist*
- ❑ *Other _____*

ASSISTIVE TECHNOLOGY TEAM REFERRAL: Communication Evaluation

Legal Name of Child/Student	Birth Date	School	Grade	Current Date
_____	_____	_____	_____	_____

NOTICE REGARDING REEVALUATION

As part of any reevaluation, the IEP team and other qualified professionals, as appropriate, are required to review existing data pertaining to your child, including previous evaluations, information provided by parent(s), current classroom-based evaluations and observations by teachers and related service providers to determine continued eligibility for special education and related services or to conduct a review for appropriate programming and placement.

Existing Data Reviewed:

_____

_____

☐ After reviewing existing data, the School District is recommending that your child be evaluated in the following areas: ***Assistive Technology***

The reason(s) the School District proposes the evaluation(s) described above are as follows:

_____

_____

The School District requires your written consent in order to complete the recommended evaluation(s). Please sign below and return this form within ten working days to the school representative listed below. In the event that this signed consent form is not returned within ten working days, the school representative will attempt to contact you at least twice by telephone for your decision. If no response is received, the school representative will assume consent and proceed with the recommended action.

Parent Signature: _____ Date: _____

Parents of a child with a disability have certain legal rights. A parental rights document is enclosed. Please read it carefully; if you have any questions regarding the reassessment process or your rights, please contact:

School representative: _____ Phone: _____

☐ A copy of the procedural safeguards has been given to the parents in their native language, or mode of communication.

☐ As the parent/guardian, I recognize that the team feels it has sufficient information, however I request reevaluation to determine my child's eligibility and/or educational needs in the following areas:

_____

Parent Signature: _____ Date: _____

AAC Skills Inventory

Sensory, Motor, Communication, Cognition

EXPLANATION

The AAC Skills Inventory is designed to facilitate **Step 1: Information-Gathering,** and **Step 2: Data Collection and Analysis** and consists of a series of questions in these crucial areas of interest:

- **Background**—general information about age, medical history, and the nature of special education services
- **Goals for the Eval**—this section is absolutely crucial for focusing energies on the appropriate target(s). What are the expectations for the eval and what do people feel is most important for the student to be able to accomplish with the aid of technology?
- **Preferred and Non-Preferred Activities**—this list can shed light on possible motivators for working with the student. What will make him/her work for a reward?
- **Sensory: Vision**—a description or picture of the student's visual perceptual abilities (acuity and processing)
- **Sensory: Hearing**—a description of the student's hearing abilities (acuity and auditory processing)
- **Gross Motor**—a description of the student's gross motor abilities as they impact the ability to use a possible AAC system
- **Fine Motor**-- a description of the student's fine motor abilities as they impact the ability to use a possible AAC system
- **Receptive Language**—a picture of how the student comprehends language
- **Communicative Intent**—a description of the student's desire to communicate a message (in whatever form or mode is available to him/her)
- **Expressive Communication**—a description of the various modes a student is currently using to communicate a message
- **Speech (Communication) Acts**—a description of the types of situations in which a student is motivated to communicate.
- **Communication Partners**—a list of people with whom the student feels comfortable communicating.
- **Cognition**-- In an excellent and extremely useful recent book chapter Rowland and Schweigert (2003) clarify the cognitive aspects of using AAC and consider the following domains to be crucial: awareness, communicative intent, world knowledge, memory, symbolic representation, and metacognitive learning strategies. We have included these as part of our AAC Skills Inventory.

***It should be noted that not all of these categories will be relevant to explore for each individual being assessed. Rather, the target questions can be culled from this master template, as needed, depending on the student's communicative, learning, and physical profile.

AAC Skills Inventory

Sensory, Motor, Communication, Cognition

NAME:	**GRADE:**	**SCHOOL:**
TEACHER:	**DOB/AGE:**	**DATE:**

BACKGROUND

- **Does s/he have a medical diagnosis? Explain:** _____

_____

- **Does s/he have any additional medical conditions? Explain:** _____

- **How does s/he qualify for special educational services?**
  - **Primary designation:** _____
  - **Secondary designation:**_____

GOAL(S) FOR EVAL

- _____
- _____

PREFERRED AND NON-PREFERRED ACTIVITIES

- **What does s/he enjoy? Not enjoy?**

Preferred	Non-Preferred

AAC Skills Inventory

Sensory, Motor, Communication, Cognition

• SENSORY: VISION

- **Does s/he have any known visual condition? Explain** _____

- **How are his/her visual perceptual skills (acuity, shape & color discrimination, etc.)?**
    - ☐ Excellent
    - ☐ Good
    - ☐ Fair
    - ☐ Poor
    - ☐ Not measureable
- **How are his/her visual motor skills?**
    - ☐ Excellent
    - ☐ Good
    - ☐ Fair
    - ☐ Poor
    - ☐ Not measureable

SENSORY: HEARING

- **Does s/he have any known auditory condition? Explain** _____

- **How is his/her auditory acuity?**
    - ☐ Excellent
    - ☐ Good
    - ☐ Fair
    - ☐ Poor
    - ☐ Not measurable
- **How is his/her auditory processing?**
    - ☐ Excellent
    - ☐ Good
    - ☐ Fair
    - ☐ Poor
    - ☐ Not measureable

AAC Skills Inventory

Sensory, Motor, Communication, Cognition

GROSS MOTOR

- **Does s/he have any significant gross motor concerns? Explain** _____

_____

_____

- **Is s/he ☐ ambulatory, ☐ ambulatory with mobility aide, or ☐ using wheeled mobility? Explain** _____

_____

- **If s/he uses wheeled mobility, describe his/her positioning during the day (i.e., consider potential positions for effectively using AAC):**
  -
  -
  -
  -
  -

FINE MOTOR

- **Does s/he have any significant fine motor concerns? (i.e., consider skills necessary for AAC use) Explain** _____

_____

- **Does s/he have difficulty with:**
  - **arm** ☐ strength ☐ range of motion ☐ motor planning ☐ timing of motion (response latency) ☐ grading of motion ☐ sequencing multiple motions
  - **hand** ☐ strength ☐ range of motion ☐ motor planning ☐ timing of motion (response latency) ☐ grading of motion ☐ sequencing multiple motions
  - **finger** ☐ strength ☐ range of motion ☐ motor planning ☐ timing of motion (response latency) ☐ grading of motion ☐ sequencing multiple motions
  - **Explain:** _____

_____

_____

AAC Skills Inventory

Sensory, Motor, Communication, Cognition

- **Can s/he use her fingers to ☐ point to, ☐ press, and/or ☐ grasp small (1" or less) targets? (consider this as a criterion for <u>direct selection</u> option for AAC access).**
  - **☐ Yes.**
  - **☐ No. Explain: _____**

_____

- **If s/he has limited or no use of upper extremities, what part of the body is most controllable: ☐ hand ☐ arm ☐ leg ☐ foot ☐ head ☐ leg (consider these as possibilities for <u>scanning</u> option for AAC access)**
  - **Explain: _____**

_____

  - **Describe accuracy, timing. and fatigue of these movements: _____**

_____

RECEPTIVE LANGUAGE

- **Does s/he respond to changes in scene/activity/location?**

  Frequency: ☐Usually ☐Moderately ☐Occasionally ☐Rarely ☐Never

- **Does s/he respond differently to familiar (as opposed to unfamiliar) people?**

  Frequency: ☐Usually ☐Moderately ☐Occasionally ☐Rarely ☐Never

- **Does s/he change response to certain spoken words/signs?**

  Frequency: ☐Usually ☐Moderately ☐Occasionally ☐Rarely ☐Never
  Setting: ☐ Home ☐ School ☐ Community
  Communication partners: ☐ Family ☐ School staff ☐ Others ☐ Familiar people ☐ Unfamiliar people

- **Does s/he respond to his/her own spoken/signed name?**

  Frequency: ☐Usually ☐Moderately ☐Occasionally ☐Rarely ☐Never
  Setting: ☐ Home ☐ School ☐ Community
  Communication partners: ☐ Family ☐ School staff ☐ Others ☐ Familiar people ☐ Unfamiliar people

- **Does s/he respond differentially to different spoken/signed names?**

  Frequency: ☐Usually ☐Moderately ☐Occasionally ☐Rarely ☐Never
  Setting: ☐ Home ☐ School ☐ Community
  Communication partners: ☐ Family ☐ School staff ☐ Others ☐ Familiar people ☐ Unfamiliar people

AAC Skills Inventory

Sensory, Motor, Communication, Cognition

- **Does s/he follow 1-2 step directions with prompts (gestures)?**

  Frequency: ☐Usually ☐Moderately ☐Occasionally ☐Rarely ☐Never
  Setting: ☐ Home ☐ School ☐ Community
  Communication partners: ☐ Family ☐ School staff ☐ Others ☐ Familiar people ☐ Unfamiliar people

- **Does s/he follow 1-2 step directions WITHOUT prompts (gestures)?**

  Frequency: ☐Usually ☐Moderately ☐Occasionally ☐Rarely ☐Never
  Setting: ☐ Home ☐ School ☐ Community
  Communication partners: ☐ Family ☐ School staff ☐ Others ☐ Familiar people ☐ Unfamiliar people

- **Does s/he recognize and/or identify pictures/objects/body parts?**

  Frequency: ☐Usually ☐Moderately ☐Occasionally ☐Rarely ☐Never
  Prompting: ☐ Independent ☐ Verbal ☐Gesture/model ☐Partial physical ☐ Full physical ☐ No response
  Setting: ☐ Home ☐ School ☐ Community
  Communication partners: ☐ Family ☐ School staff ☐ Others ☐ Familiar people ☐ Unfamiliar people

- **Does s/he enjoy looking at pictures, books, movies?**

  Frequency: ☐Usually ☐Moderately ☐Occasionally ☐Rarely ☐Never
  Prompting: ☐ Independent ☐ Verbal ☐Gesture/model ☐Partial physical ☐ Full physical ☐ No response
  Setting: ☐ Home ☐ School ☐ Community
  Communication partners: ☐ Family ☐ School staff ☐ Others ☐ Familiar people ☐ Unfamiliar people

- **Does s/he follow a class routine or schedule?**

  Frequency: ☐Usually ☐Moderately ☐Occasionally ☐Rarely ☐Never
  Prompting: ☐ Independent ☐ Verbal ☐Gesture/model ☐Partial physical ☐ Full physical ☐ No response

- **Does s/he understand single words/signs?**

  Frequency: ☐Usually ☐Moderately ☐Occasionally ☐Rarely ☐Never
  Prompting: ☐ Independent ☐ Verbal ☐Gesture/model ☐Partial physical ☐ Full physical ☐ No response
  Setting: ☐ Home ☐ School ☐ Community
  Communication partners: ☐ Family ☐ School staff ☐ Others ☐ Familiar people ☐ Unfamiliar people

- **Does s/he understand phrases/sign sequences?**

  Frequency: ☐Usually ☐Moderately ☐Occasionally ☐Rarely ☐Never
  Prompting: ☐ Independent ☐ Verbal ☐Gesture/model ☐Partial physical ☐ Full physical ☐ No response
  Setting: ☐ Home ☐ School ☐ Community
  Communication partners: ☐ Family ☐ School staff ☐ Others ☐ Familiar people ☐ Unfamiliar people

- **Does s/he understand basic word/sign order (syntax)?**

  Frequency: ☐Usually ☐Moderately ☐Occasionally ☐Rarely ☐Never
  Prompting: ☐ Independent ☐ Verbal ☐Gesture/model ☐Partial physical ☐ Full physical ☐ No response
  Setting: ☐ Home ☐ School ☐ Community
  Communication partners: ☐ Family ☐ School staff ☐ Others ☐ Familiar people ☐ Unfamiliar people

AAC Skills Inventory

Sensory, Motor, Communication, Cognition

COMMUNICATIVE INTENT

THE FOLLOWING ARE PRIME INDICATORS FOR THE PRESENCE OF COMMUNICATIVE INTENT IN THE INDIVIDUAL'S ACTION (after Wetherby & Prizant, 1989):

- **Alternating eye gaze between a goal and a listener**

  Frequency: ☐Usually ☐Moderately ☐Occasionally ☐Rarely ☐Never
  Prompting: ☐ Independent ☐ Verbal ☐Gesture/model ☐Partial physical ☐ Full physical ☐ No response
  Setting: ☐ Home ☐ School ☐ Community
  Communication partners: ☐ Family ☐ School staff ☐ Others ☐ Familiar people ☐ Unfamiliar people

- **Persistence in signaling until the goal is reached**

  Frequency: ☐Usually ☐Moderately ☐Occasionally ☐Rarely ☐Never
  Prompting: ☐ Independent ☐ Verbal ☐Gesture/model ☐Partial physical ☐ Full physical ☐ No response
  Setting: ☐ Home ☐ School ☐ Community
  Communication partners: ☐ Family ☐ School staff ☐ Others ☐ Familiar people ☐ Unfamiliar people

- **Changing the quality of the signal until the goal is met**

  Frequency: ☐Usually ☐Moderately ☐Occasionally ☐Rarely ☐Never
  Prompting: ☐ Independent ☐ Verbal ☐Gesture/model ☐Partial physical ☐ Full physical ☐ No response
  Setting: ☐ Home ☐ School ☐ Community
  Communication partners: ☐ Family ☐ School staff ☐ Others ☐ Familiar people ☐ Unfamiliar people

- **Using a signal that is ritualized or has a conventional form within a specific context**

  Frequency: ☐Usually ☐Moderately ☐Occasionally ☐Rarely ☐Never
  Prompting: ☐ Independent ☐ Verbal ☐Gesture/model ☐Partial physical ☐ Full physical ☐ No response
  Setting: ☐ Home ☐ School ☐ Community
  Communication partners: ☐ Family ☐ School staff ☐ Others ☐ Familiar people ☐ Unfamiliar people

- **Awaiting a response from the receiver**

  Frequency: ☐Usually ☐Moderately ☐Occasionally ☐Rarely ☐Never
  Prompting: ☐ Independent ☐ Verbal ☐Gesture/model ☐Partial physical ☐ Full physical ☐ No response
  Setting: ☐ Home ☐ School ☐ Community
  Communication partners: ☐ Family ☐ School staff ☐ Others ☐ Familiar people ☐ Unfamiliar people

- **Terminating the signal when the goal is achieved**

  Frequency: ☐Usually ☐Moderately ☐Occasionally ☐Rarely ☐Never
  Prompting: ☐ Independent ☐ Verbal ☐Gesture/model ☐Partial physical ☐ Full physical ☐ No response
  Setting: ☐ Home ☐ School ☐ Community
  Communication partners: ☐ Family ☐ School staff ☐ Others ☐ Familiar people ☐ Unfamiliar people

- **Indicating satisfaction if the goal is met**

  Frequency: ☐Usually ☐Moderately ☐Occasionally ☐Rarely ☐Never
  Prompting: ☐ Independent ☐ Verbal ☐Gesture/model ☐Partial physical ☐ Full physical ☐ No response
  Setting: ☐ Home ☐ School ☐ Community
  Communication partners: ☐ Family ☐ School staff ☐ Others ☐ Familiar people ☐ Unfamiliar people

- **Indicating dissatisfaction if goal is not met**

  Frequency: ☐Usually ☐Moderately ☐Occasionally ☐Rarely ☐Never
  Prompting: ☐ Independent ☐ Verbal ☐Gesture/model ☐Partial physical ☐ Full physical ☐ No response
  Setting: ☐ Home ☐ School ☐ Community
  Communication partners: ☐ Family ☐ School staff ☐ Others ☐ Familiar people ☐ Unfamiliar people

AAC Skills Inventory

Sensory, Motor, Communication, Cognition

EXPRESSIVE COMMUNICATION

- **Eye gaze**
  - ☐ Intentional ☐ Not intentional ☐ Accurate (scale of 1-5) _____
  - ☐ Directed at a person ☐ An object or activity
  - ☐ Shifting gaze from person to object/activity?
  - ☐ Formal system? (e.g., use of ETran board) Explain:

- **Proxemics**
  - Approach/avoidance of a communication partner

    Frequency: ☐Usually ☐Moderately ☐Occasionally ☐Rarely ☐Never
    Setting: ☐ Home ☐ School ☐ Community
    Communication partners: ☐ Family ☐ School staff ☐ Others ☐ Familiar people ☐ Unfamiliar people

  - Physical contact: does the individual approach and take the communication partner by the hand? ☐Yes ☐No

    Frequency: ☐Usually ☐Moderately ☐Occasionally ☐Rarely ☐Never
    Setting: ☐ Home ☐ School ☐ Community
    Communication partners: ☐ Family ☐ School staff ☐ Others ☐ Familiar people ☐ Unfamiliar people

- **Gestures**
  - Pointing

    Frequency: ☐Usually ☐Moderately ☐Occasionally ☐Rarely ☐Never
    Setting: ☐ Home ☐ School ☐ Community
    Communication partners: ☐ Family ☐ School staff ☐ Others ☐ Familiar people ☐ Unfamiliar people

  - Hand or arm movement

    Frequency: ☐Usually ☐Moderately ☐Occasionally ☐Rarely ☐Never
    Setting: ☐ Home ☐ School ☐ Community
    Communication partners: ☐ Family ☐ School staff ☐ Others ☐ Familiar people ☐ Unfamiliar people

  - Body movement

    Frequency: ☐Usually ☐Moderately ☐Occasionally ☐Rarely ☐Never
    Setting: ☐ Home ☐ School ☐ Community
    Communication partners: ☐ Family ☐ School staff ☐ Others ☐ Familiar people ☐ Unfamiliar people

AAC Skills Inventory

Sensory, Motor, Communication, Cognition

- **Manual sign**
  - Using ☐ASL (American Sign Language) or ☐SEE (Signed Exact English) or ☐Fingerspelling or _____

    Frequency: ☐Usually ☐ Moderately ☐ Occasionally ☐Rarely ☐ Never
    Prompting: ☐ Independent ☐ Verbal ☐Gesture/model ☐Partial physical ☐ Full physical ☐ No response
    Setting: ☐ Home ☐ School ☐ Community
    Communication partners: ☐ Family ☐ School staff ☐ Others ☐ Familiar people ☐ Unfamiliar people

  - How many signs in total repertoire? _____ Examples:

    Prompting: ☐ Independent ☐ Verbal ☐Gesture/model ☐ Partial physical ☐ Full physical ☐ No response
    Setting: ☐ Home ☐ School ☐ Community
    Communication partners: ☐ Family ☐ School staff ☐ Others ☐ Familiar people ☐ Unfamiliar people

  - Multiple signs strung together? ☐Yes ☐No

    Prompting: ☐ Independent ☐ Verbal ☐ Gesture/model ☐ Partial physical ☐ Full physical ☐ No response
    Setting: ☐ Home ☐ School ☐ Community
    Communication partners: ☐ Family ☐ School staff ☐ Others ☐ Familiar people ☐ Unfamiliar people

  - How many signs in a typical statement?_____
  - How accurate are his/her signs? Scale of 1-5 (1 = accurate, 5 = vague approximation) _____

- **Object symbols (tangible symbols)**
  - How many objects are used? _____ Examples:
  - Level of representation: ☐ Exact copy ☐ One or two features? Visual? Tactile? Other? ☐ More abstract? Explain _____
  - How are the objects organized? _____

- **Pictures**
  - How many pictures are used? _____ Examples:
  - Level of representation: ☐ Color photograph ☐ Black & white photograph ☐ Detailed drawing ☐ Line drawing (e.g., Boardmaker PCS) Explain:

- Is s/he using a "formal" system like PECS or more informal system? Explain:

- How are the pictures organized? (☐ communication board? ☐ PECS book? ☐ Topics or categories? ☐ Parts of speech?) Explain:

- **AAC device**
  - What type of device(s)? _____
    - ☐ Single message or ☐ multiple messages? (How many messages and how is it set up?)_____
    - Is it ☐ dynamic display or ☐ static display
    - Does it have ☐ digital speech (a person's voice recorded) or ☐ synthesized speech (computerized voice)
    - Icon organization:
      - ☐ Leveling (i.e., navigating through various layers of "pages" that are arranged in categories)
      - ☐ Spelling/literacy
      - ☐ Generative language
        - ☐ One word at a time (Gateway, Word Power, Picture Word Power)
        - ☐ "Semantic Compaction"--Minspeak/Unity
      - ☐ A combination of the above? Explain _____
  - Is s/he successfully using it? (What does "success" mean for this student?)

    ☐ Yes ☐ No

    Frequency: ☐Usually ☐Moderately ☐Occasionally ☐Rarely ☐Never
    Prompting: ☐ Independent ☐ Verbal ☐Gesture/model ☐Partial physical ☐ Full physical ☐ No response
    Setting: ☐ Home ☐ School ☐ Community
    Communication partners: ☐ Family ☐ School staff ☐ Others ☐ Familiar people ☐ Unfamiliar people

    Explain:

- Can s/he communicate his/her message successfully or get his/her needs met? ☐ Yes ☐ No

  Frequency: ☐Usually ☐Moderately ☐Occasionally ☐Rarely ☐Never
  Prompting: ☐ Independent ☐ Verbal ☐Gesture/model ☐Partial physical ☐ Full physical ☐ No response
  Setting: ☐ Home ☐ School ☐ Community
  Communication partners: ☐ Family ☐ School staff ☐ Others ☐ Familiar people ☐ Unfamiliar people

- Is his/her use of the device intentional or accidental?

  Frequency: ☐Usually ☐Moderately ☐Occasionally ☐Rarely ☐Never
  Prompting: ☐ Independent ☐ Verbal ☐Gesture/model ☐Partial physical ☐ Full physical ☐ No response
  Setting: ☐ Home ☐ School ☐ Community
  Communication partners: ☐ Family ☐ School staff ☐ Others ☐ Familiar people ☐ Unfamiliar people

- How does s/he respond if his/her message is not understood? ☐ Passive? ☐ Agitated? ☐ Angry? ☐ Tries to repeat or correct the misunderstanding?

  Frequency: ☐Usually ☐Moderately ☐Occasionally ☐Rarely ☐Never

- **Speech/verbalizations**

  - ☐ Single words? (how many single words in repertoire?_____ Up to about 50 is the usual transition to multiple word utterances)

    Frequency: ☐Usually ☐Moderately ☐Occasionally ☐Rarely ☐Never
    Setting: ☐ Home ☐ School ☐ Community
    Communication partners: ☐ Family ☐ School staff ☐ Others ☐ Familiar people ☐ Unfamiliar people

  - ☐ Multiple words? How many?_____ Using syntax/grammar to put them together? ☐ Yes ☐ No

    Frequency: ☐Usually ☐Moderately ☐Occasionally ☐Rarely ☐Never
    Setting: ☐ Home ☐ School ☐ Community
    Communication partners: ☐ Family ☐ School staff ☐ Others ☐ Familiar people ☐ Unfamiliar people

  - How many words are in a "typical" verbal utterance?_____

    Frequency: ☐Usually ☐Moderately ☐Occasionally ☐Rarely ☐Never
    Setting: ☐ Home ☐ School ☐ Community
    Communication partners: ☐ Family ☐ School staff ☐ Others ☐ Familiar people ☐ Unfamiliar people

  - How is his/her articulation? How intelligible is his/her speech? (20%? 50%? 90%?) To a familiar listener?_____% To an unfamiliar listener?_____%

    Frequency: ☐Usually ☐Moderately ☐Occasionally ☐Rarely ☐Never
    Setting: ☐ Home ☐ School ☐ Community
    Communication partners: ☐ Family ☐ School staff ☐ Others ☐ Familiar people ☐ Unfamiliar people

AAC Skills Inventory

Sensory, Motor, Communication, Cognition

SPEECH ACTS (COMMUNICATION ACTS)

- **How does s/he gain attention?**_____

  Frequency: ☐Usually ☐Moderately ☐Occasionally ☐Rarely ☐Never
  Setting: ☐ Home ☐ School ☐ Community
  Communication partners: ☐ Family ☐ School staff ☐ Others ☐ Familiar people ☐ Unfamiliar people

- **How does s/he request continuation of something s/he enjoys? (reinstatement of a preferred activity) "more"** _____

  Frequency: ☐Usually ☐Moderately ☐Occasionally ☐Rarely ☐Never
  Setting: ☐ Home ☐ School ☐ Community
  Communication partners: ☐ Family ☐ School staff ☐ Others ☐ Familiar people ☐ Unfamiliar people

- **How does s/he express rejection/discontinuance of an activity?** _____

  Frequency: ☐Usually ☐Moderately ☐Occasionally ☐Rarely ☐Never
  Setting: ☐ Home ☐ School ☐ Community
  Communication partners: ☐ Family ☐ School staff ☐ Others ☐ Familiar people ☐ Unfamiliar people

- **Does s/he choose between 2 things? ☐ Yes ☐ No ☐ More? How many?** _____
  How is this expressed?_____

- **How does s/he express greetings? Parting?** _____

- **Does s/he answer yes/no questions reliably? ☐ Yes ☐ No**
  How?_____

  Frequency: ☐Usually ☐Moderately ☐Occasionally ☐Rarely ☐Never
  Setting: ☐ Home ☐ School ☐ Community
  Communication partners: ☐ Family ☐ School staff ☐ Others ☐ Familiar people ☐ Unfamiliar people

- **Does s/he express emotions/feelings? ☐ Yes ☐ No How?**_____

  Frequency: ☐Usually ☐Moderately ☐Occasionally ☐Rarely ☐Never
  Setting: ☐ Home ☐ School ☐ Community
  Communication partners: ☐ Family ☐ School staff ☐ Others ☐ Familiar people ☐ Unfamiliar people

  - Pleasure?
  - Displeasure?
  - Pain?
  - Tired?
  - Excitement?
  - Boredom?
  - Afraid?

- Depressed?
- Thirsty?
- Hungry?
- Confused?
- Content?
- Embarrassed?
- Upset?
- Uncomfortable?
- Surprised?
- Sad?
- Happy?
- Frustrated?
- Disappointed?
- Curious?
- Hot?
- Cold?

- **Requests for affection/interaction. How does s/he indicate wanting:**
  - Adult to sit near?
  - Peer to sit near?
  - Adult to look at him/her?
  - Adult to tickle him/her?
  - To cuddle/hug?
  - To sit on adult's lap?
  - Other?

- **Requests for adult action. How does s/he indicate wanting:**
    - Help with dressing?
    - To be read a book?
    - To play ball/a game?
    - To go outside?
    - Other?
- **Requests for object, food, or things. How does s/he indicate wanting:**
    - An object out of reach?
    - A door/container opened?
    - A favorite food?
    - Music/radio/TV?
    - Keys/toy/book?
    - Other?
- **Protest. How does s/he react if:**
    - Common routine is dropped?
    - Favorite food/toy is taken away?
    - Taken for a ride without desire?
    - Adult terminates interaction?
    - Required to do something s/he doesn't want to do?
    - Other?
- **Declaration/Comment. How does s/he indicate wanting:**
    - To show you something?
    - You to look at something?
    - Other?

AAC Skills Inventory

Sensory, Motor, Communication, Cognition

COMMUNICATION PARTNERS

- **Adults?**
- **Peers?**
- **Siblings?**
- **Parents?**
- **Unfamiliar individuals?**

COGNITION

- **Attention span—S/he attends to a task:**

  Frequency: ☐Usually ☐Moderately ☐Occasionally ☐Rarely ☐Never
  Prompting: ☐ Independent ☐ Verbal ☐Gesture/model ☐Partial physical ☐ Full physical ☐ No response
  Setting: ☐ Home ☐ School ☐ Community
  Communication partners: ☐ Family ☐ School staff ☐ Others ☐ Familiar people ☐ Unfamiliar people

- **Distractibility—S/he is distracted by environmental events (noise, activity, people, etc.):**

  Frequency: ☐Usually ☐Moderately ☐Occasionally ☐Rarely ☐Never
  Prompting: ☐ Independent ☐ Verbal ☐Gesture/model ☐Partial physical ☐ Full physical ☐ No response
  Setting: ☐ Home ☐ School ☐ Community
  Communication partners: ☐ Family ☐ School staff ☐ Others ☐ Familiar people ☐ Unfamiliar people

- **Alertness—level of alertness according to observation:**

  ☐ High: eyes open, listens, requires little or no prompting to orient to situation
  ☐ Moderate: eyes open, mostly oriented to environment, eye contact may drift off, may require prompts to react to environmental event
  ☐ Low: looks down, may close eyes, fails to observe environmental events, frequent prompts to arouse
  ☐ Lethargic: eyes may be closed, exhibits drowsiness, low energy level, medication or health effects
  ☐ Non-responsive: does not respond to attempts to engage, or does so only momentarily

  Frequency: ☐Usually ☐Moderately ☐Occasionally ☐Rarely ☐Never

- **Response rate--**

  ☐ Appropriate: responds in an appropriate manner (timing, impulse control, delay, etc.)
  ☐ Impulsive: responds without taking the time to process necessary information
  ☐ Delays: long latency of response time (wait time)

  Frequency: ☐Usually ☐Moderately ☐Occasionally ☐Rarely ☐Never

AAC Skills Inventory

Sensory, Motor, Communication, Cognition

- **Awareness of environmental events**

  Frequency: ☐Usually ☐Moderately ☐Occasionally ☐Rarely ☐Never
  Prompting: ☐ Independent ☐ Verbal ☐Gesture/model ☐Partial physical ☐ Full physical ☐ No response
  Setting: ☐ Home ☐ School ☐ Community
  Communication partners: ☐ Family ☐ School staff ☐ Others ☐ Familiar people ☐ Unfamiliar people

- **Non-social contingency awareness (individual's awareness that his/her actions have an effect on the inanimate environment)—cause and effect**

  Frequency: ☐Usually ☐Moderately ☐Occasionally ☐Rarely ☐Never
  Prompting: ☐ Independent ☐ Verbal ☐Gesture/model ☐Partial physical ☐ Full physical ☐ No response
  Setting: ☐ Home ☐ School ☐ Community
  Communication partners: ☐ Family ☐ School staff ☐ Others ☐ Familiar people ☐ Unfamiliar people

- **Object permanence (awareness that objects continue to exist even when they are hidden or out of visual range)**

  ☐ Adequate
  ☐ Fair
  ☐ Poor
  ☐ Not present

  In what contexts or settings is this seen?_____

- **Awareness of others**

  ☐ Adequate
  ☐ Fair
  ☐ Poor
  ☐ Not present

  Frequency: ☐Usually ☐Moderately ☐Occasionally ☐Rarely ☐Never
  Setting: ☐ Home ☐ School ☐ Community
  Communication partners: ☐ Family ☐ School staff ☐ Others ☐ Familiar people ☐ Unfamiliar people

- **Social contingency awareness (individual's awareness that his/her actions have an effect on other people)**

  Frequency: ☐Usually ☐Moderately ☐Occasionally ☐Rarely ☐Never
  Prompting: ☐ Independent ☐ Verbal ☐Gesture/model ☐Partial physical ☐ Full physical ☐ No response
  Setting: ☐ Home ☐ School ☐ Community
  Communication partners: ☐ Family ☐ School staff ☐ Others ☐ Familiar people ☐ Unfamiliar people

- **Cooperation**

  Frequency: ☐Usually ☐Moderately ☐Occasionally ☐Rarely ☐Never
  Prompting: ☐ Independent ☐ Verbal ☐Gesture/model ☐Partial physical ☐ Full physical ☐ No response
  Setting: ☐ Home ☐ School ☐ Community
  Communication partners: ☐ Family ☐ School staff ☐ Others ☐ Familiar people ☐ Unfamiliar people

- **Memory—short-term/working**

☐ Functional
☐ Limited
☐ No recall
☐ Not testable

- **Memory—long-term**

☐ Functional
☐ Limited
☐ No recall
☐ Not testable

- **Metacognitive awareness**

☐ Can self-monitor and self-correct effectively, when appropriate
☐ Can self-monitor; cannot self-correct
☐ Cannot self-monitor or self-correct
☐ Not testable

iPad Apps for an AAC Evaluation

AAC Evaluation Genie (Hump Software)--an informal diagnostic tool for skill areas that relate specifically to the language representation methods commonly found on AAC systems. 14 subtests:

- **Visual Identification** (visually track and identify a single icon from 5" to 1" in size)
- **Visual Discrimination** (visually track and discriminate a single icon from 5" to 1" in size)
- **Noun Vocabulary** (identify common noun vocabulary)
- **Function Vocabulary (**identify common noun vocabulary by stated function)
- **Verb Vocabulary** (identify common verb (action word) vocabulary)
- **Category Recognition** (identify common noun vocabulary by category group inclusion)
- **Word Association** (identify a noun by associated feature or function)
- **Category Inclusion** (identify common noun vocabulary by category inclusion)
- **Category Exclusion** (identify common noun vocabulary by category exclusion)
- **Pixon Core Vocabulary** (recognize and identify common core vocabulary words not easily represented with pictures using Pixon symbols)
- **Unity Core Vocabulary** (identify common core vocabulary words not easily represented with pictures using Minspeak Unity symbols)
- **Unity Icon Patterns** (identify vocabulary via Minspeak Unity semantic/linguistic patterns)
- **Picture Description** (describe basic pictures using a simulated AAC display)
- **Word Prediction** (read text and select a target word from a list of four choices)

Fine Motor & Visual Motor Apps:

- *Touch Trainer*: touching buttons that get progressively smaller
- *Motion of a Finger (PreciseFinger)*: tracing patterns with your finger
- *Slide 2 Unlock*: teaching the iPad sliding motion
- *iMazing*: follow a maze with your finger
- *Dexteria*: write it, pinch it, tap it
- *Wood Puzzle Maze HD*: simple interactive mazes
- *Catch the Cow*: tests fine motor and supports scanning

Picture ID/ Preference (you need to customize picture choices)

- *See.Touch.Learn:* real photo flash cards
- *Talk'n Photos*: customizable talking photo album
- *Point to Pictures*: AAC training activity (cartoon pics)

iPad Apps for an AAC Evaluation

Sequencing

- *Sono Flex Lite*: AAC app--build sentences word by word
- *Alexicom AAC* (Lite version): AAC app: build sentences word by word
- *Speech with Milo—Sequencing*: telling what happened first, next and last
- *Making Sequences*: image sequences for stories--customizable
- *Series 1*: arrange objects in a series based on shape, color, size and quantity

Memory, Visuo-spatial Attention

- *PhotoMatchTots:* customizable concentration game--2X3 or 3X4 grid
- *Toddler Memory Match*: picture & voice memory match game—Eng & Span—3X3 grid
- *Memory Matches:* traditional memory game—4X4 or 6X6 grids
- *Photo Memory Game (MatchaPhoto)*: several grid sizes
- *Creature Match HD:* no grid, colorful & eye-catching creatures
- *Simply Smarter Kids*: sequential processing, memory
- *Picture Photo Match*: Create your own cards with photos
- *Concentration—The Attention Trainer:* longer & longer sequences

Categories

- *Natural Learning Concepts Autism*: sort & categorize
- *What Does Not Belong:* category exclusion
- *AAC Evaluation Genie*—several activities (see above)

*****Try using an actual AAC app in a naturalistic ("authentic") social situation (evaluate requesting, commenting, greeting, turn-taking, etc.)—e.g., *Proloquo2Go*, *TouchChat* with *Word Power*, *LAMP Words for Life*, *Sono Flex*, *Alexicom, GoTalk Now*, *Expressive*, etc.**

AUGMENTATIVE AND ALTERNATIVE COMMUNICATION (AAC): AN INTRODUCTION

WHAT IS AAC?

For students with complex communication needs (i.e., those unable to meet their daily communication needs through "natural" modes such as speech) speech-language services can be helpful, as well as some form of assistive technology accommodation: **"Augmentative and Alternative Communication" (AAC) can be defined as any device, system, or method that improves the ability of a child with a communication impairment to communicate effectively.** It can include sophisticated devices and systems (sign language, communication boards, or speech-generating devices) as well as less sophisticated means (pictures or objects used as symbols, etc.) AAC is introduced when the student does not develop communication in the typical fashion, or experiences significant delays, and is used to AUGMENT or add to **(not replace!)** whatever communication the student possesses, as part of a **"multimodal"** system. A few indicators for introducing some form of AAC might include: a moderate to severe expressive speech/language disorder, an expressive/receptive language gap (the student understands more than s/he can say), limited speech or expressive language improvement with therapy, and/or the student's frustration at his/her inability to communicate messages effectively.

SOME TYPES OF AAC

- **No Tech:** These are "**unaided**" systems an individual uses with no additional tools or technology such as motor behaviors, gestures, vocalizations, verbalizations (or verbal approximations), proxemics (approach or avoidance of a communication partner), eye gaze, and facial expressions.

- **Low Tech:** These are "**aided**" communication strategies (i.e., requiring some type of external assistance for the symbols) which do not run from a power source. Examples: picture or object communication, the Picture Exchange Communication System (PECS), partner assisted scanning, etc.

- **Light Tech:** voice output communication systems which are typically battery operated and have a **static** (non-changing) display such as the BIGmack, Rocking Plate Communicator, Step-by-Step, Cheap Talk, Tech/Talk, Go Talk, SuperTalker, or 7-Level Communication Builder.

- **High Tech:** Systems typically requiring an electronic power source and having a **dynamic** (changing—i.e., computerized LCD screen) display such as a DynaVox Maestro, a Prentke Romich Accent, a Saltillo Nova-Chat or an iPad (with an appropriate AAC app).

AAC (speech generating) devices may have **digitized speech output**: a time-sampled replication of actual human speech. You speak, and it records what you say so that the student can use that utterance in the context of a communicative interaction. AAC devices with **synthesized speech output** translate the user's input (choosing letters, words, or symbols) into computer-generated speech. Generally speaking, digitized speech is more natural sounding than synthesized speech in terms of pitch, resonance, and prosody.

AUGMENTATIVE AND ALTERNATIVE COMMUNICATION (AAC): AN INTRODUCTION

WILL USING AAC PREVENT A STUDENT FROM USING OR DEVELOPING NATURAL SPEECH?

The research says: NO! It may actually improve speech.

Two recent articles (Millar, Light, & Schlosser, 2006, and Schlosser & Wendt, 2008) reviewed all of the previously-published research that had investigated speech production before, during, and after AAC intervention. NONE of the individuals involved in any of the studies demonstrated decreases in speech production as a result of AAC intervention. The majority demonstrated at least modest gains in speech (a small percentage showed no change).

AAC is sometimes viewed as a "last resort," to be considered only after years of speech language therapy have proven unsuccessful. In reality, AAC can be used very effectively in conjunction with therapy, and may enable the student to immediately participate in communicative interactions with peers and others in school, at home, and in the community. While speech is always the most natural way to communicate, there are definitely other excellent possibilities, and it is essential that a student has SOME means of consistent control over his/her environment. AAC can be a useful TOOL, to be used when it is most appropriate: AAC strategies can be customized and upgraded over the lifetime of an individual (e.g., introducing different or more sophisticated devices, if warranted), or else faded completely if other natural modes (such as speech) improve.

***There have been NO published studies that show decreased speech production as a result of AAC.**

WHY MIGHT AAC INTERVENTION (e.g., SPEECH GENERATING DEVICES) IMPROVE SPEECH?

Consider the following:

- AAC can encourage the student to be less of a passive observer during communicative interactions and more of an active participant.
- AAC may increase the number of messages that are possible and increase the length of the student's utterance.
- AAC produces immediate acoustic output (the message), is effective across many environments, and offers a consistently-produced "speech model" for the student to listen to and imitate.
- The acoustic output can be paired with the visual symbol (word, picture, or icon), thereby strengthening the connection between the spoken word, graphic symbol, and the referent (what the symbol refers to).
- Hearing oneself produce speech via a speech-generating device may help stimulate and develop the brain mechanisms utilized for speech production ("internal phonology")

AUGMENTATIVE AND ALTERNATIVE COMMUNICATION (AAC): AN INTRODUCTION

ARE THERE ANY "PREREQUISITES" (e.g., AGE OR COGNITION) FOR USING AAC?

The current research says: NO! If needed, AAC interventions can be introduced at ANY time.

Chronological age is sometimes mentioned as an argument against the provision of AAC services: "The student is too young to benefit." However, there is absolutely no evidence to verify this position! Current research clearly documents the efficacy of AAC for infants, toddlers, and preschoolers.

In addition, in years past, clinicians had hesitated to recommend AAC interventions until the student had attained a certain cognitive level ("cognition" is the ability to think, solve problems, remember, etc.)—This position has been shown in many studies to be totally unfounded: while cognition and communication skills are related, they can (and in many cases do) operate independently.

Experts agree: there is no reason to delay the start of AAC programs for individuals with severe disabilities and, in fact, there are many compelling reasons for beginning communication intervention at a young age even if certain cognitive skills have not been attained.

MULTIMODAL COMMUNICATION: AN EXPLANATION

What is it? Multimodal communication is the use of more than one type of communication method or mode during an interaction. It can include speech (verbalizations), verbal approximations, vocalizations (and voice inflection), gestures (e.g., pointing), manual sign or sign approximations, facial expressions, eye gaze, body orientation or movement, proxemics (approach/avoidance to a communication partner), as well as the use of aided AAC strategies (pictures, objects, speech generating devices, etc.). Basically, it includes anything that an individual can do in order to communicate a message.

Multimodal communication is natural. Multimodal communication is our natural means of expression—all of us use different modes of expression constantly and are able to "read body language" when we are interacting with others. Much more additional information is conveyed in this manner than would be possible through single modes.

Multimodal communication is flexible. People need to be able to use different communication modes in different social circumstances—what might seem appropriate with friends in an informal interaction might be totally out of place interacting with your teacher, or with your new relatives at a wedding, for example. Similarly, a student who communicates with his/her paraprofessional with manual sign language would need to have the flexibility to communicate via a different mode in the community with individuals who do not understand sign.

Multimodal communication is easy. Students will always rely on the easiest and simplest means of expression, as long as it is effective. If they can point, they will point; if they can smile, they will smile to

let you know they are happy; if they can guide you by the hand to get a snack, that is the way they will naturally let you know they are hungry.

High tech is not always "best tech." Using a complex, high-tech, speech-generating device is a powerful and versatile means of communication for students with complex communication needs, but it might actually be cumbersome in certain circumstances. It is unnatural to expect anyone to choose a more complicated method of communication over an easier and more efficient one! For example, if the student can wave a hand to greet you, why make him/her scramble to find the "hello" button on the DynaVox or PRC Accent? High tech definitely has its place, but it is most important to be flexible, especially for times when the high tech device may not available for some reason.

CONCLUSIONS?

1. **AAC strategies encompass a range of possibilities, from "no tech" and "low tech" to "high tech" and can be used effectively as part of a student's "multimodal" system of communication.**
2. **AAC strategies are meant to augment (add to) and not replace, a student's natural means of communication.**
3. **The introduction of AAC intervention will NOT impede natural speech. In some cases AAC may in fact improve speech production, but this will vary from person to person.**
4. **There are specific advantages (and NO disadvantages) to using AAC strategies.**
5. **There are no prerequisites for introducing AAC.**

Additional information on these topics can be found on the YAACK website (http://aac.unl.edu/yaack/b2.html) the DynaVox "Implementation Toolkit" website (http://www.dynavoxtech.com/implementation-toolkit/), and the following articles:

- Blischak, D. M., Lombardino, L. J., & Dyson, A. T. (2003). Use of speech-generating devices: In support of natural speech. Augmentative and Alternative Communication, 19, 29–35.
- Kangas, K. & Lloyd, L. (1988). Early Cognitive Skills as Prerequisites to Augmentative and Alternative Communication Use: What are we Waiting For? Augmentative and Alternative Communication, 4, 211-221.
- Loncke, F.T., Campbell, J., England, A.M., & Haley, T. (2006). Multimodality: A basis for augmentative and alternative communication—psycholinguistic, cognitive, and clinical/educational aspects. Disability and Rehabilitation, 28, 169-174.
- Millar, D. C., Light, J. C., & Schlosser, R. W. (2006). The impact of augmentative and alternative communication intervention on the speech production of individuals with developmental disabilities: A research review. Journal of Speech, Language, and Hearing Research, 49, 248-264.
- Schlosser, R., & Wendt, O. (2008). Effects of augmentative and alternative communication intervention on speech production in children with autism: A systematic review. American Journal of Speech-Language Pathology, 17(3), 212–230.

ASSISTIVE TECHNOLOGY & COMMUNICATION:
Encouraging Your Students in the Classroom

"Augmentative or Alternative Communication (AAC) is any device, system, or method that improves the ability of a child with a communication impairment to communicate effectively." Encouraging these students to use augmentative/alternative communication (AAC) strategies in the classroom can be challenging. The following are some general and more specific suggestions and ideas...

General Suggestions

- **Collaborate and strategize** with all staff and parents: teachers, SLPs, OTs, PTs, paras, etc.
- Make sure all staff are **trained** on AAC device usage (if necessary)
- **"Think multimodal"—**a speech generating device can be used in one context, picture symbols in another. We all communicate in multiple modes (speech, gesture, smiles, etc.)
- **Program age- and peer-appropriate vocabulary—**"gross," "cool," "what's up?"
- Include appropriate **negative comments** on the student's AAC system
- **Use sabotage and temptations for increased communication opportunities.** For example, give your student a fork to eat his/her cereal with or skip a student's turn in a fun activity and see how s/he problem solves this "mistake."
- **"Engineer the Environment":**
    - **Identify and prioritize communication activities** that occur throughout the day. The best teaching moments occur during "real life" activities in context.
    - **Develop message sets** for each activity using the student's AAC system.
- Plan and use **scripted routines** for longer turn-taking (two-three-four exchanges)
- **Organize** the AAC user's physical environment
    - Access: Appropriate **positioning** of the AAC
    - Access: Appropriate **organization** of the symbols for fast retrieval
    - If the student is using a dynamic screen device, does s/he know where to find the information? Has s/he had time to **explore** and **practice** the pages?
    - Does s/he have something s/he wants to talk about?
    - **Set the AAC user up for success**!!!
- **Communication strategies for facilitators:**
    - **Encourage peers** to figure out messages from the AAC user.
    - **Expect a response** every time.
    - **Respond** to any attempt by the student to communicate as you would any other child.
    - **Confirm** the intended message; clarify if unsure.
    - Have a **shared focus**—confirm the same topic.
    - **Vary** meaningful activities and provide choice making and opportunities for comments, greetings and other interactions throughout the day.
    - Do not talk for or respond for the student
    - **Learn to "Wait" 20 or 30 seconds**—It seems like a long time to wait. It's not!

- **Model--**Adult shows how to interact using the talker: “You do it” “You try”
- **PROMPT only when REQUIRED:** Wait, don’t hover--aim for independence.
- **Possible prompts** can include:
    - telling your student to "use his/her words" (e.g., **verbal** reminders)
    - illustrating the correct symbol choice using sign language or other visual representation without pointing to your student's actual communication board (e.g., **visual** prompts)
    - modeling pointing to the correct symbol (e.g., **gestural** prompts)
    - verbally stating the correct response (e.g., verbal **model**)
    - physically helping your student point to the correct symbol (e.g., **physical** assistance)
    - **REMEMBER TO ALLOW ADEQUATE WAIT TIME!**

Specific Ideas for Younger Students

Arrival

- Yes/No questioning-regarding hot or cold lunch option for the day.
- Live voice scan regarding who student wants to be his/her "helper" for the day or who s/he wants to sit by at circle time.
- Single message devices can be used to greet staff or peers.
- A Step-by-Step (message sequencer) can be used to allow for communication regarding arrival topics, such as requesting assistance with removal of outerwear or items in a backpack.
- The student can use a multiple location device to make comments or respond to questions.

Literature Activity

- A two-choice communication system can allow the student to participate in pre-reading activities such as making a choice of books, selecting a reader, or selecting the type of voice used to read the story.
- A single message device can be used for the student to request that the page of a book be turned or the repetitive line of a story be read.
- The student can use eye gaze to identify vocabulary words upon request.

Post-Literature Activity

- A picture communication board can be used for the student to comment on a story or to make requests. For example, "That's scary," "That's funny," "Read it again."
- Yes/no questions or live voice scan can be used to assess the student's comprehension of the book.

Social Studies

- The student can activate a Step-by-Step (message sequencer) to call on peers or identify a state and have a peer name the corresponding capital.
- The student can use a switch-activated spinner to select a picture symbol of a state and activate a single message device to request the name of the state.
- Picture symbols can be sequenced to represent events of a trip.

- A multiple location overlay can be used on a voice output device to direct peers to move from location to location on a map.

Math

- The student can use a switch-activated spinner to select numerals to create math calculation problems for their classmates to compute.
- A multiple location overlay can be used on a voice output device for the student to identify values of mixed groups of coins.

Sharing

- Velcro can be used to attach a souvenir onto a single message device. The student can activate a prerecorded message to give details about his/her souvenir to the class.
- The student can demonstrate an electrically powered toy with a switch, activated with an AAC device.
- The student can demonstrate a battery-operated toy using a switch with a battery device adapter.
- A multiple location overlay on a voice output device can be used for the student to direct peers in a multiple step recipe or experiment.
- The student can ask peers questions or make comments using a multiple location communication device.

Lunch

- The student can use a customized lunch tray, lunchbox, or placemat with picture symbols to make comments or requests in the lunchroom setting.
- The student can use any multiple location voice output device to order lunch items.

Recess

- Wristbands can be created with digital photos for choice making between recess activities (e.g., swing, slide).
- The student can wear a fanny pack or a janitor key ring with photos or picture symbols representing choices for recess activities, peers to play with, or general comments/requests.
- The student can use a play mat for indoor recess. For example, place picture symbols on a placemat for a bubble-blowing activity (pop it, blow a big bubble, and blow a small bubble).
- A Step-by-Step message sequencer can be used to direct peers during a game situation (Simon Says).

Departure

- The student can use a single-message device to relay a message about events of the school day to the home setting.
- Live voice scan can be used to have the student select whom they want to sit by on the bus.

Specific Ideas for Older Students

- Participate in specific events that require contextual messages (e.g., singing a song that is pre-programmed, e.g., "Happy Birthday" or "For He's a Jolly Good Fellow")
- Say (or lead) the Pledge of Allegiance
- Cheer or boo a favorite sports team
- Converse on the telephone
- Greetings and departures
- Comment on things ("This food is disgusting") and activities ("Yeah—this is cool!")
- Indicate enthusiasm ("I want more") or the need to discontinue an activity ("I need a break")
- Ask questions ("What's your name?" "What's your favorite music?")
- Maintain the conversation with optional comments like "Really?" or "Uh-huh."
- Make requests in predictable situations ("I'd like a cheeseburger")
- Initiate conversations or introducing topics ("How was your weekend?")
- Make introductions between people
- Tell a knock-knock joke (e.g., using a Step-by-Step message sequencer)
- Recite a scripted series of lines in a class play
- Relate pre-programmed academic information to the class during a classroom presentation
- Dictate the words in a spelling test to the rest of the class
- Engage in simple, predictable conversations that involve turn-taking
- Participate in a predictable song with repeated lines ("We all live in a Yellow Submarine")
- Discuss the season and weather in a structured classroom routine
- Relate the day of the week and the date in a structured classroom routine
- Discuss upcoming events of interest to the class
- Discuss what s/he had for lunch in a structured classroom routine
- Discuss what s/he did over the weekend/summer break in a structured classroom or conversational routine
- Relate daily "school news to home" and "home news to school"
- Converse about personal information: family members, address, phone number, pets, favorite music, favorite sports, etc. in structured and unstructured discourse
- Give information about personal preferences ("I like Hip Hop music." "My favorite movie is Pirates of the Caribbean.")
- Give information about emotions ("I'm happy") and physical status ("I feel tired." "I feel sick.")
- Participate in an educational "game" played by the class or group of students
- Interface the AAC device with a computer to participate in literacy activities:
    - Reading—using text readers such as WYNN
    - Writing—using onscreen keyboards, word prediction (e.g., Co:Writer), using email
- Interface the AAC device with a computer to surf the web for information