

# CONTINUING EDUCATION for Occupational Therapists

## Communication Levels & Augmentative-Alternative Communication

PDH Academy Course #OT-1804 | 3.5 CE HOURS



American  
Occupational Therapy  
Association

Approved Provider

This course is offered for 0.35 CEUs (Intermediate level; Category 1 - Domain of OT: Instrumental Activities of Daily Living; Category 1 - Domain of OT: Activity Demands; Category 1 - Domain of OT: Performance Skills). *The assignment of AOTA CEUs does not imply endorsement of specific course content, products, or clinical procedures by AOTA.*

### Course Abstract

This course discusses communication levels and corresponding Augmentative-Alternative Communication (AAC) interventions and implementation strategies, with particular attention paid to the role of Aided Language Stimulation (ALgS).

Target audience: Speech-Language Pathologists, Speech-Language Pathology Assistants, Occupational Therapists, Occupational Therapy Assistants

*NOTE: Links provided within the course material are for informational purposes only. No endorsement of processes or products is intended or implied.*

### Learning Objectives

By the end of this course, learners will be able to:

- ❑ Differentiate between the four competency goals shared by all Augmentative-Alternative Communication (AAC) users, with attention to factors that influence communication competence
- ❑ Recognize two methods of categorizing communication levels/communicators and AAC possibilities for each
- ❑ Recall two interactions used to foster language growth
- ❑ Recognize the importance of partner training and its role in AAC implementation strategies
- ❑ Identify Aided Language Stimulation (ALgS), with attention to creating/providing opportunities to use it
- ❑ Recognize prompting and how it should be used
- ❑ Recall why and how participation-based activities support contextual teaching
- ❑ Differentiate between functional and therapeutic communication interactions
- ❑ Recall several ways intervention sessions can provide opportunities to practice social communication
- ❑ Identify ways that the course material impacts the practice of Occupational Therapy

### Timed Topic Outline

- I. Communication Competence (15 minutes)
- II. Developmental Levels of Communication (40 minutes)
- III. Emerging, Beginning and Intermediate Symbolic Communicators (15 minutes)
- IV. How and Where to Begin? (15 minutes)
- V. Partner Training (Including Handout) (20 minutes)
- VI. Augmentative-Alternative Communication (AAC) Implementation Strategies (5 minutes)
- VII. Aided Language Stimulation (ALgS): AAC Immersion (15 minutes)
- VIII. Creating and Providing Opportunities to Use ALgS (15 minutes)
- IX. Prompting Strategies (5 minutes)
- X. Contextual Teaching and Active Participation (5 minutes)
- XI. Functional vs Therapeutic Communication Intervention (5 minutes)
- XII. Pull out or Push-in? (5 minutes)
- XIII. Intervention Sessions (15 minutes)
- XIV. Furthering Communication Skills (5 minutes)
- XV. A Word about Setting and Writing Goals (5 minutes)
- XVI. References, Additional Resources, and Exam (25 minutes)

## Delivery & Instructional Method

Distance Learning – Independent. Correspondence/ internet text-based self-study, including a provider-graded multiple choice final exam. *To earn continuing education credit for this course, you must achieve a passing score of 80% on the final exam.*

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## Course Author Bio & Disclosure

Susan Berkowitz received a B.A. in Psychology from Clark University, an M.S. in Speech-Pathology and Audiology from Tulane, and an M.Ed. in Education Administration from California State University at Fullerton. She also has extensive graduate background in Special Education and Applied Behavior Analysis, and has worked with children with autism for more than 40 years.

Susan has worked in a variety of settings as a SLP, a Director of Education, and a Chairperson of the Speech Pathology Department. Her career has taken her to public and private schools, developmental centers, group homes, and adult day programs. She currently runs her own private practice in San Diego, providing Independent Educational Evaluations in speech-language, AAC, and Assistive Technology, as well as consultation and staff training. She presents at a variety of national conferences and provides workshops in AAC, autism, and literacy.

**DISCLOSURES:** Financial -- Susan Berkowitz is the owner of, and a developer at, Language Learning Apps LLC; offers materials for purchase at TeachersPayTeachers.com; and received a stipend as the author of this course. Nonfinancial – No relevant nonfinancial relationship exists.

## Communication

### Competence: Four Areas

The overarching expectation of all of AAC intervention needs to be the idea and belief that the individual has something to say. It is our job to provide him with the opportunity to do so. And in that, our motto needs to be “Presume competence.”

Light (1989) has delineated four areas of competence that need to be developed in AAC users:

#### Linguistic Competency

In addition to learning the general receptive and expressive language skills typically developed by all individuals, AAC users need also to learn the linguistic code of the particular AAC system and symbol system that they are learning to use: both the meaning of the symbols, and how to use them and combine them to construct desired messages.

Because the AAC system may use symbols, words, or letters, it is different from the linguistic system of expressive language used by others in the individual’s environment. This is further confounded by the lack of phonological, semantic, and/or syntactic features of the AAC system’s language.

#### Operational Competency

Operational skills are those needed to learn how to operate the system and access the symbols it uses. They include the skills needed to form the hand shapes of signs and sequence the motor movements needed to find, reach, and activate symbol buttons.

Operational skills are necessary to not only operate the individual components of the system, but to learn to do so in a way that minimizes both the impact of fatigue and the time it takes to produce a message. Operational skills are impacted by the cognitive, motor, linguistic, and sensory perceptual capabilities of the user.

#### Social Competency

Social skills are those that allow the individual to utilize linguistic and operational skills to effect competency in communication with others. Light proposed that there are two types of

social skills required for communication: *sociolinguistic* and *sociorelational* skills.

Sociolinguistic skills are typically referred to as pragmatic skills. These skills include the strategies needed for discourse, such as turn taking, topic initiation and maintenance, and communicative functions.

Sociorelational skills are those that involve judgment, knowledge, and skills in interpersonal relationships. These may include being responsive to a partner, actively participating in the exchange, taking interest in the communication partner, engaging in interactions, maintaining rapport with partners, and putting partners at ease.

### Strategic Competency

AAC users' development of linguistic, operational, and social competencies are all impacted by the limitations of their various disorders, and by the limitations of the AAC system itself.

Despite intervention, AAC users may be restricted by the limits of what the AAC system can provide for them. A child who is not yet literate, for example, is dependent upon others to provide vocabulary for him to use and may often encounter situations in which he does not have the word that he needs. Likewise, a severely involved individual with cerebral palsy may be reliant on switch scanning access to the AAC system, and therefore not be able to maintain the speed of interaction in typical conversational exchanges.

In these and other instances the AAC user will need to develop strategies to optimize efficient and effective communication within the limits of the system itself. Strategic competence can allow the AAC user to attain communicative competence in spite of linguistic, operational, or social impairments.

### Case in Point:

*Martin was an 18 year old young man with severe cerebral palsy, spastic quadriplegia.*

*Martin's parents had become frustrated with the school district's lack of effective education for their son. Tired of teachers who either thought he wasn't capable of learning or didn't know how to teach him, they took Martin out of school at age 16. He was sent to an Adult Day Program with other persons with cerebral palsy.*

*At this program Martin was lucky to find staff who knew something about AAC and had the materials to provide him with a beginning system. They created a categorical or topical picture communication book with multiple pages, and taught Martin about Partner Assisted Scanning. Within a short amount of time, they were able to hold up a page, ask him if what he wanted to say was on that page, and move through the pages quickly until he indicated the one he wanted. They then scanned across the rows of*

*pictures on that page until he got to the row that held the pictured message he wanted, then scanned across that row to find what Martin wanted to say.*

*When an AAC assessment became available in their area, Martin's parents brought him to the center for an assessment. A staff of speech-language pathologists and physical therapists found a system that would work for him, including a high tech dynamic display device and a switch for scanning access. A wheelchair mount was ordered so that the device was always on his wheelchair.*

*When the system arrived at the center, Martin and his family came to pick it up. Once it was mounted on his wheelchair and the switch scanning access set up, Martin used a combination of symbols with words and the keyboard to type out the message, "Thank you so much for giving me a voice. Now I can speak like everyone else."*

*No one had ever taught Martin language or literacy skills. He had sat in the back of the classroom for 10 years.*

*Martin is, of course, the exception and a truly exceptional young man. Most students require specific direct instruction, multiple opportunities with good support, and – of course – an effective AAC system.*

### Communication Competence: Other Influencing Factors

*Motivation* is critically important for AAC users to put forth the significant effort needed to learn to use the AAC system. The AAC user needs to feel that the goal for this communication instance is worth the effort it will take, and that the goal is both attainable and desirable. Without sufficient motivation, AAC users may tend to restrict the effort they make.

The *attitude* of the AAC user – and his partners – towards the AAC system will also impact his use of it. The user needs to believe that the AAC system will help him become an effective communicator. This attitude may be influenced by prior experiences with AAC – both positive and negative – and by the attitudes of those around him. Overcoming a negative attitude is critical in developing communication.

It has been said that *confidence* leads to competence. The individual needs to feel confidence in himself and his AAC system in order to continue to act and interact with it. In an environment where the AAC user does not see others using AAC competently, or interacts with partners who are not themselves competent with using the system, confidence might be difficult to build.

*Resilience* is what keeps the AAC learner attempting communication with a system that he has yet to learn, and with which he experiences some failure. The AAC learner may experience a variety of barriers and lack of success: there may not be acceptance of the AAC system in all of his environments or by all of his partners; the system itself may not be optimal for meeting his needs; partners that are not trained

and/or not familiar with his AAC system can present barriers to using the system. Resilience – the capacity to compensate or overcome problems and to continue trying even after failures – will be very important.

The *communication demands* placed on AAC learners also impact development of communicative competence. The social roles of the AAC user influence the types of demands placed upon him, and these roles are highly dependent upon his age and situation.

Social roles change from infancy through school age; adolescence; young, mature and late adulthood. AAC users' social roles change – as do everyone's – from being a child and recipient of services, to being a student, to becoming a member of communities and participant in community activities, to becoming a worker and, possibly, a parent. Throughout most of these there is also the role of friendship. Many AAC users find restrictions placed on them by virtue of their AAC use, such as developing the role of friend, significant other, parent, and even employee.

The communication demands of each of these roles are different, each can be difficult, and the goals of interaction change within each.

Light (1988) proposes four main goals of communicative interactions: to express needs and wants, to develop social closeness, to exchange information with others, and to fulfill social etiquette expectations.

Light, Beukelman, and Reichle (1988, 2003) list the types of interactions and accompanying communication goals:

Interaction Type	Communication goal	Communication Demands
Express wants and needs	Regulate behaviors of others to get wants/needs met	Get partner's attention Indicate item desired or express rejection Use politeness markers Terminate activity
Develop social closeness	Establish & develop personal relationships	Identify shared topics of interest Make eye contact & attend to partner & provide appropriate feedback Express affect, resolve conflict, continue engagement
Exchange information	To get or give information	Attend to partner's comments & questions, identify opportunities to ask questions or share information Identify new topics Confirm partner's understanding, continue to monitor aspects of interaction
Fulfill social etiquette	Conform to social conventions of politeness	Identify required opportunities to participate Fulfill these as required Terminate interactions as appropriate

## Developmental Levels of Communication

Rowland and Schweigert (1997) created a construct of 7 levels of communicative abilities that help in assessments (see Rowland's Communication Matrix) and intervention:

### Level 1: Unintentional behavior

Behavior is not under the individual's control, but reflects his general state (comfortable, hungry, etc.) Caregivers interpret the individual's state from behaviors such as body movements, facial expressions, and sounds.

In typically developing children this stage occurs between 0 and 3 months.

### Level 2: Intentional behavior:

Behavior is under the individual's control, but not yet used to communicate intentionally. Individuals at this stage don't yet realize they can use behaviors to control another person's behavior. Caregivers continue to interpret the individual's needs based on the behaviors. The consistent feedback provided by caregivers in responding to specific actions with specific consequences builds the individual's understanding of how to use behaviors to communicate.

This usually is between 3 and 8 months of age in typical children.

### *Related Topics: Establishing Intent*

*Knowing that unintentional behaviors can acquire communicative value through the use of routines reminds us that it is not ever too early to begin intervention with AAC.*

*Intervention can begin with a behavior that works for the specific individual for a specific function, and shape it into a more conventional response; Wetherby and Prizant (1989) suggest using disruptive or surprising elements to prompt communication behaviors. Use of picture symbols to communicate builds on those responses.*

*With children who appear to lack intentional communication, or who do not realize how to use the communication skills they have to get what they want, there are a variety of ways we can begin to establish communicative intent.*

*The Picture Exchange Communication System (PECS) is a no-tech communication system. PECS has its own intervention system, which is delineated in their teaching materials (Bondy, Frost, 2002). In brief, the system involves beginning with something that motivates the child, something that has strong reinforcing value.*

*The first step, or Phase 1, teaches communication initiation using that reinforcing item, a symbol/picture, and two people; one to facilitate, the other to guide. The guide has the child hold the picture and guides him to approach the other person (who has the reinforcer) while holding out the picture. An exchange is made between the child, who hands over the picture, and the partner, who hands over the item. That is the simplified version of the initial phase.*

*Phase 2 involves making the communication exchange more realistic, but increasing the distance between the child and the symbol as well as the partner.*

*Phase 3 involves teaching discrimination between pictures and adding them to the communication array. This phase of intervention includes adding “distractors,” or items the child does not want. Unfortunately, this also involves moving the pictures around and alternating their spatial relationship with other pictures available. This lack of stability has been shown to make picture display learning more difficult. Research and experience has also taught us that mere picture discrimination does not translate into use for communicative purposes and that, in fact, using pictures in the system with good modeling and aided input obviates use of the discrimination phrase of learning. (Berkowitz, Calculator)*

*Phase 4 introduces sentence structure with the “I want...” sentence strip. Focusing on wants only means that requesting is the communicative intent taught to the exclusion of all others at this phase. Functional communication responses for a variety of other communicative needs – especially among a population of children with ASD – is not optimal.*

*Phase 5 teaches answering questions, using the question, “What do you want?”*

*Phase 6 teaches commenting, using the carrier phrase, “I see...”*

*According to the more recent AAC research, however, picture stability, use of core words, focus on Aided*

*Language Stimulation (ALGS) and on increased communication function all provide practitioners with alternative teaching strategies that are more realistic, naturalistic, and provide for more communication autonomy.*

*Not all AAC learners are children, and many adults with severe disabilities have not had the benefit of ALGS or intervention at early ages. Some few of these may not have any intentionality; they do not show awareness of others’ behaviors. The further we get from the institution of Public Law 94-142 (which guarantees a free appropriate public education to each child with a disability) in 1975, the fewer individuals there are with severe disabilities who have not had at least some intervention.*

*More often we see individuals with severe disabilities who have goal-driven behavior, but not the awareness of how to obtain the goal. And even more often we see individuals who have learned that specific behaviors can be helpful. Many current adults with developmental disabilities were taught initial signs at some point when they were younger: they know the sign for eat and/or drink and/or toilet and/or please. This last is the least functional of all, and has no linguistic meaning for most of these individuals – but they do know that if they go to someone and do this action, they get a response. Further behavior on their part can shape this response from their partner into something that gets them their objective.*

*Some individuals with severe disabilities do understand that their communication partner plays a part in meeting their needs. Many individuals will lead or drag their partner to what they want, or else approach and stare, or move towards their objective (i.e. stand by the door to ask to go outside).*

### **Level 3: Unconventional communication (pre-symbolic)**

This is where intentional communication begins. Unconventional pre-symbolic behaviors are used intentionally to communicate. Communicative behaviors do not yet involve any sort of symbol, nor are they socially acceptable for use as the individual ages. Communicative behaviors include body movements, facial expressions, vocalizations, and simply gestures such as tugging on someone.

It typically occurs between 6 and 12 months of age.

#### ***Related Topics: Moving from Unconventional to Conventional Communication***

*Typical children move through the pre-symbolic stage on their way to more complex communication. Pre-symbolic communication can be effective, but for a limited range of functions and only in the here and now. Moving to symbolic communication is the only way to communicate about things/events/etc. beyond the immediate environment and context.*

*Many individuals with severe disabilities of all ages*

*use a variety of behaviors to express themselves, not all of which are deemed appropriate or acceptable by others in their culture. Some of these can be destructive to themselves or their environment: individuals may pull out their hair or bite themselves when angry or frustrated; they may hit the wall or others when upset or to get attention; they might throw objects or break them. These behaviors may continue to be used because they have had some function reinforced: they might gain the user access to a desired item, or escape from an unpleasant or difficult task, or attention from someone.*

*Moving these unconventional communicative behaviors to more conventional and symbolic communication involves a replacement behavior that is equally communicative, equally easy to do, and gains an equal response. It needs to be devised or discovered and then used consistently by the communication partners. A careful functional analysis of the behaviors will determine their function or the communicative intent, so that intervention can be effective.*

*As will be discussed, routines are how we build symbol and language development. Routines are sequences of actions or events that are repeated over and over again. The reactions and responses become symbols that are used by partners to communicate to each other. Routines help us build symbolic awareness, and symbols become communicative when they come to have a more standardized or conventional meaning among a larger group.*

*Gayle Porter begins early intervention with very young children with cerebral palsy by using her Pragmatic Organized Dynamic Display (PODD) books – a system of communication books and teaching strategies for navigation and operational strategies utilizing aided input. Eventually, input yields to expression as soon as children can reliably use a gesture to accept, or accept and reject, a word or message. The PODD navigation constructs are based upon routine and repetition to build comprehension and use, and Aided Language Stimulation is the key that Porter stresses to communication partners and interventionists. It is her belief and evidence that providing consistent Aided Language Stimulation with the AAC system allows individuals to develop symbolic communication earlier than some might expect.*

*Carol Goossens delineated four guidelines for Aided Language Stimulation:*

- *use primarily single words/symbols and short but grammatically correct phrases to talk about what the child does, sees, hears, and feels*
- *use lots of repetition as you describe ongoing events*
- *speak slowly, inserting numerous pauses into the conversational flow*
- *whenever the child indicates something with a single word/symbol, expand that message into a semantically equivalent two word/symbol combination*

#### **Level 4: Conventional communication** **(pre-symbolic)**

Communication behaviors do not yet use symbols but are socially acceptable and individuals continue to use them as they age or mature. They include pointing, nodding, shaking the head, waving, hugging, and looking from the partner to a desired item. These may involve vision skills, so are not appropriate for all individuals with vision impairments. There may also be some vocalizations used.

This stage is usually from 12-18 months. However, typical children at 12-18 months may already be using symbolic communication (Level 5). They can have 20-100 words and use a variety of communication behaviors.

Examples, provided by The N.C. Department of Public Intervention, include existence (ball, mama, juice), nonexistence (no more, all gone, no), recurrence (more), rejection (no), denial (no), attribution (big, dirty, broken), possession (mine, mommy), action (wash, play, eat, drink), locative action (go, sit, up, out, there).

#### **Level 5: Concrete symbols**

This is the beginning of symbolic communication. Concrete symbols – those that represent and physically move, feel, or sound like what they are – are used to communicate. They can be pictures, but can also be objects (a shoelace to represent “shoe”), iconic gestures (patting a chair to say “sit down”), and sounds (buzzing to sound like a bee).

Typically developing children use concrete symbols in conjunction with words and gestures, generally between 12 and 24 months. Typically developing children between 18 and 24 months may have as many as 300 words.

Given the same communicative intents, examples of vocabulary can include:

a ball, this ball, that ball  
no ball, no more juice, juice all gone  
more juice, more swing  
no  
no that  
big ball, dirty ball, broken truck  
daddy car, my nose, doggy ear  
read a book, ride this  
away ball, up me

In the next phase of development (Level 6) both functions and syntax expand.

#### ***Related Topics: Moving from Concrete to Abstract Symbols***

*For some, the transition from tangible objects to symbol pictures may involve the use of tangible object-based*

icons: photos or drawings that have been laminated and cut out into the shape of the actual thing. Photographs of specific places, events, or people are often used at this stage. They can be easily velcro'd to a felt board or velcro-covered page. This technique is also often used when working with books with students who need symbols to tell about or participate in a retell of the story: illustrations from the book are copied, laminated, and used as manipulatives.

Language intervention techniques that can be used to increase early expressive communication skills at this level include use of:

- Aided AAC Modeling or Aided Language Stimulation
- Expectant Delay
- Open-ended/WH-Question Asking
- Brief Verbal Prompting
- Increased Responsivity

### **Aided Language Stimulation (ALgS)**

Otherwise known as Partner Augmented Input or Natural Aided Language, ALgS (briefly addressed above in the context of PDD) is a communication strategy where communication partners teach symbol meaning and language use by pairing verbal input with use of the symbols on the AAC system simultaneously. ALgS attempts to provide the same kind of language learning environment that is available to verbal children for children who use aided symbols – it teaches language to AAC users in the same way that language is taught to typically developing children – and it also teaches the user how to think about language, which is important.

AAC users and learners need to see models of their system being used interactively by others who are communicating real messages in real situations, they need to have multiple opportunities to practice using their system to communicate real messages in real situations while being provided with the appropriate level of scaffolding required to be successful, they need to receive natural feedback, and they need to have their messages expanded by others using the same mode of communication they use, so that they can learn to communicate more effectively.

Partners should use pictures while talking, producing messages for a wide variety of communicative functions (e.g. questions, comments, greetings, requests, responses, giving and asking for information, telling, directing), using as much of the available vocabulary as is possible/practical. Using aided language for commands or questions should be minimized; maximize use of statements and comments.

### **Expectant Delay**

Within the context of every interaction is at least one, if not multiple, opportunity(ies) to arrange the environment so that a communication response is necessary. During any play interaction the partner can model a comment

(it fun, this is fun, like, I like this, look, look at that, etc.). The partner then waits with the expectant signal (a questioning look, shrugged shoulders, tilted head) and, if needed, prompts a response. Continued modeling, waiting, and prompting forms a continuous loop of communicating and creating communication opportunities.

During a snack or other eating time, partners can create the need to model requests, demonstrating, directing with words such as; “that” “that one” “want that” “give that” “want more” “I want some” “open it” “help please” etc. Model, wait expectantly, prompt.

Inserting that wait time is crucial, as is using an expectant facial expression and body language. Too often communication partners do not wait long enough for the individual to respond. They forget to consider the processing lag, motor response delay, or formulation time needed. They may be so anxious to get the individual to communicate that they prompt too quickly and too often. In order for the AAC user to develop natural communication the prompt dependency and one-sidedness of continuous questions and prompts needs to be changed.

### **Questions, Prompts and Responding**

It is important for partners to remember to ask open-ended questions as much as possible. Asking yes/no questions, and/or Wh-questions that need only a single word response, does not provide opportunities for communicating and interacting. Once the brief response is given, the exchange is over.

Verbal prompting should be kept brief. Providing too much verbal input for the learner to process can impede the communication interaction. Repeated verbal prompting becomes nagging.

Partners need to be attuned to the learner's use of communicative responses and should respond to them consistently. By responding to the learner's attempts to communicate the partner provides vital reinforcement. Opportunities are then also provided for the partner to give specific feedback, by recasting the response; that is, repeating it with errors corrected, or with expansion.

### **Level 6: Abstract symbols**

This includes speech, signs, Braille, or printed words used to communicate. These symbols are abstract because they are not physically similar to what they represent. They are used one at a time.

All words – either spoken or written – are abstract symbols. It is not possible to detect their meaning by looking at them. They do not resemble what they represent.

This usually occurs between 12 and 24 months, when typically developing children start to use words consistently, building their vocabulary as they share using words with others.

## **Related Topics: Teaching Symbolic Communication**

*This level is where deaf children in a deaf community begin using signs consistently to communicate with others in their community.*

*Likewise, this is, ideally, the point at which AAC users should begin growing their vocabulary of symbol use. AAC systems should contain symbols that are used consistently with and by partners. AAC users at this stage should already have a robust symbol system that partners have been using to provide aided input, and should be using these symbols themselves, slowly building vocabulary with practice and feedback.*

*In spite of some early success with manual signs, picture-based systems have been more successful with children with autism than any other system, according to the research. Once symbols can be used, the range of vocabulary expands to a broader lexicon.*

*Language Acquisition through Motor Planning (LAMP) is a therapeutic approach based on motor learning principles using word-based high tech devices, particularly those from the Prentke-Romich Company (PRC) that utilize the Unity system of vocabulary organization. (Unity focuses on having a limited number of symbols that represent core vocabulary and signals syntactic and semantic variety with combinations of symbols.)*

*A more familiar example of learning through motor automaticity is touch typing. Just as typists have no need to look at the page when they type, motor automaticity allows AAC users to access symbols without needing to think about movement. This allows for increased pace of interaction, which is a key for fluid conversations. In terms of language learning, this allows users to focus on the meaning of the message they are constructing rather than finding the target symbol on the display. Without motor automaticity, AAC users can spend a lot of time and energy locating a word or message.*

*Motor automaticity is supported by the stability of location of symbols on a display. Just as typists would lose their efficiency and accuracy were the keys on a keyboard constantly moving, AAC users need to be able to find the words they need in the same place all the time. Without stability of vocabulary location, communicating can be exhausting and frustrating.*

*LAMP focuses on having unique motor plans for each word, giving the individual independent access to vocabulary that speaks. The motor movement, paired with the auditory output and a response to it, is how individuals learn words. Individuals generally acquire at least 50, or 50-100, words before beginning to combine them into two-word phrases. Single words are flexible, and can be used multiple ways and in multiple sequences.*

*The goal of LAMP is to provide individuals with limited expressive skills a way to communicate in any setting.*

*By giving every word a unique motor plan, we mimic the type of motor learning that speaking individuals use when they articulate.*

*LAMP was originally designed to teach children with autism to use high tech voice output devices to communicate. Research has shown that use of LAMP with nonverbal children with autism increases their ability to communicate spontaneously, and decreases inappropriate behaviors.*

*LAMP is ideally suited to PRC devices with the Unity symbol system of vocabulary organization. However, it can be used with other word-based, generative language systems – such as Word Power, SonoFlex, and Gateway software – as well as some AAC apps, including Proloquo2go and, of course, the LAMP Words for Life app.*

*LAMP relies upon the brain's function to recognize patterns and to learn faster when using them. Just as PODD users rely upon the consistent patterns of access through the operational and linguistic patterns of that system, LAMP relies upon the learning of motor patterns to build language competency.*

*Dynamic display devices that have Word Power vocabularies utilize the same core vocabulary/ word-generative philosophy. Word Power was designed by Nancy Inman for core vocabulary users. Other core vocabulary/word generative concepts are found in varying degrees and formats in the Gateway software developed by Joan Bruno and found on Dynavox (now Tobii/ Dynavox) devices, and on the SonoLexis software found on Tobii/ATI (now Tobii/Dynavox) devices.*

## **Level 7: Language**

Symbols (both concrete and abstract) are combined into two- or three-symbol combinations (“want juice,” “me go out”) according to grammatical rules. The individual understands that the meaning of symbol combinations may differ depending upon how the symbols are ordered.

Typically this begins around 24 months.

## **Emerging, Beginning and Intermediate Symbolic Communicators**

Another way to categorize communicators is to think of only 3 levels: emerging communicators, beginning symbolic communicators, and intermediate symbolic communicators.

The group of emerging communicators includes all of those from pre-symbolic unintentional behavior that the partner interprets as communicative, through those who have intentional goal-directed behavior, to those who exhibit intentional communicative behaviors – directed to others – using gestures, facial expressions, and other non-symbolic means.

Beginning symbolic communicators might be using some symbols (including signs/sign approximations), referential gestures (such as pointing), verbalization approximations, beginning graphic symbols, or simple low tech devices (such as a BIGmack single message switch or Partner 2 static display device). They may use these methods to make choices or deliver greetings.

Intermediate symbolic communicators are those who are using a small number of symbols (perhaps 25 core words) in one word messages. Some may have as many as 50 or more symbols that they use, and can begin to combine them into two symbol sequences; such as I want... or I like...

Communicators in the emerging stage may be good candidates for use of tangible systems (although many AAC professionals feel that use of 2-dimensional systems in conjunction with aided language stimulation and a variety of partner enhanced strategies will provide significantly greater vocabulary and purpose access than a tangible system can). Use of tangible systems works best when the individual displays communicative intent or is in the zone of development to be taught.

Tangible, 3-dimensional objects were first used by Jan van Dijk in the 1960's to establish communication for children who were deaf-blind. Tangible systems continue to be used for individuals who are deaf-blind, as well as those with severe to profound intellectual disabilities and other significant impairments. There is no standardized set of tangible objects used; the individual learns the intended representation of the object through repeated, consistent use and routine. (This is the same rationale used by Gayle Porter to begin communication with abstract symbols, aided input, and consistency with PODD books).

Indications that have been used to determine when individuals can begin to use tangible objects to communicate include:

- the individual has intentional behavior that can be used as a signal to communicate or indicate a symbol
- the individual understand his ability to control the behavior of the partner through some pre-symbolic behavior
- the individual is not already using abstract symbols to communicate

Tangible-based systems can be used for both meeting of basic needs and academic or environmental participation. By looking at the figures below, you can see that tactile systems with and without switches are used to communicate



items needed for a task or vocabulary needed to participate in playing a game, to communicate what the individual wants or needs, to sequence the order of an activity or task, and to participate in "reading" a book.

Tangible symbols are real objects, miniature objects, partial objects, or textures: they can be held and touched. An individual with vision impairment, one who is deaf-blind, or one who is severely developmentally delayed or with multiple disabilities could discriminate them by feel or texture. They are permanent, and do not need to be remembered. They represent something else and should be used in conjunction with a 2-dimensional symbol support.

Examples of tangible symbols include a toilet handle (bathroom), a piano key (I want to play on the key board), a small ball (I want to go out and play ball), a pencil (I want to draw), a piece of faux fur (I want to play with the dog/cat). Adaptivation provides examples of how to use concrete symbols on their website. (<http://www.adaptivation.com/Resources>)

Object-based systems are meant to move an individual from pre-symbolic to symbolic communication. They provide a level of scaffolding from one level to the next. Many low tech systems can be added to tangible systems to move the individual towards more symbolic communication. As the individual moves away from 3-dimensional tangible systems and begins to use 2-dimensional symbols, a variety of single switches can provide beginning vocabulary. Moving to 2-dimensional symbols means greater portability of the system and the ability to add less-concrete vocabulary.

Tangible symbols can be individualized, ensuring they have meaning for the user, or they can



be shared. In a classroom, group home, or workshop environment it is easier to use a shared system for practical purposes. It is also easier for staff to use consistently when multiple users are using the same system as opposed to individualized systems.

Another intervention program designed to work with individuals at the very beginning or emergent level is the Every Move Counts Clicks and Chats (EMC<sup>3</sup>). This is a sensory-based intervention system for use with individuals with complex communication needs and severe multiple disabilities (individuals believed to be functioning below the 18 month level of development). This program determines which sensory experiences (auditory, visual, vestibular, olfactory, gustatory, tactile) impact the child, and how to expand this impact to promote communication. This system does not use prompting of any kind, in order to avoid prompt dependency. The program itself includes assessment and intervention strategies. (<http://www.everymovecounts.net/>)

For individuals at the beginning or intermediate symbolic levels of communication there are many ideas for AAC intervention, but few structured strategies or curricula. The Pixon Project, a collaboration of a small group of speech-language pathologists and educators, attempted to provide a curriculum for teaching AAC use in the absence of any other such program.

The Pixon symbols are a hybridization of the Mayer-Johnson PCS and Minspeak symbols. The PLLAN (Pixon Language and Learning Activity Notebook) kit provides specific steps and lessons to give structure to the teaching of language to learners with limited skills. It is to be used as a basis for an intervention plan with AAC users who are learning how to use generative language with their AAC systems. While it is not a comprehensive curriculum, it does provide structure for knowing what vocabulary to include in an AAC system, how to organize those words, and what strategies to use to teach core words.

The PLLAN promotes learner-initiated or controlled activities. It instructs partners to use consistent modeling and Aided Language Stimulation. It encourages use of descriptive teaching (the process of using the words in the system to describe and define words that are not there). It instructs partners to move from context-dependent learning to decontextualized learning in order to teach learners how to recognize a symbol that depicts a single meaning for a multiple meaning word that can be used in other contexts. Partners are also encouraged to use masking to gradually introduce the learner to increased vocabulary; this allows the partner to focus on specific target words, while also allowing the user to have a system that presumes a display size goal without needing to fill all of the display locations with vocabulary that has not yet been learned.

The Pixon PLANN (among other intervention plans)

also promotes teaching core vocabulary use to AAC learners.

Oftentimes AAC users are first taught to recognize and use pictures or symbols for concrete objects. The assumption is that concrete items will be more easily understood by, and therefore used by, the beginning AAC user. However, nouns have relatively little use outside of requesting which is, in itself, a “dead end” communication function. Once a request for an item has been made there is little – or nothing – else to say. Nouns by themselves convey no meaning except as labels, and rarely tell the communicative intent of the user beyond the possibility of requesting.

Core vocabulary, on the other hand, is re-useable vocabulary; it consists of high-frequency words that are multi-purpose and versatile, and are used over and over in multiple contexts and with clear meaning. Core vocabulary is consistent across place and topic, and is independent of cognitive ability. Core words are used frequently, are used in multiple contexts and environments, and include a variety of parts of speech. Approximately 80% of the words used in a language sample of 100 words will be core words – but since many of the core words will have been repeated, there will actually be a small number of words used. Core words may take more direct instruction and time to learn, but, once learned, can be used in multiple ways across multiple situations.

Symbols for core vocabulary are more abstract than nouns. Verbs can sometimes be understood from a symbol, as well as some adjectives and spatial concepts. But many core words are not transparent to the “listener” without reading the label positioned above them. Using context in teaching these words, then, becomes even more important. Real, authentic experiences in which the word is used will teach the word and its symbol, despite the opacity of the symbol itself.

Regardless of whether core words will be built one at a time or a dozen at a time, it is important to start with a display that is larger than it needs to be in the beginning – one that is approximately a size that will be functional for the individual for a while. Often 25-36 location grids are used as a starting point; sometimes larger grids are used. The grid can then initially have a single word, or a few words, with more core words added as language and communication grow. It is important that the vocabulary be placed in its permanent location from the beginning, so that it remains stable throughout learning.

As a new word is added, emphasize it more than others in Aided Language Stimulation and elicitation strategies. Provide activities that focus on that word more than others, while still maintaining use of words that have been established.

Beyond contextual use, begin to add practice

activities that practice locating and using the word in decontextual activities.

Modify traditional games so that the words needed to play them are the words you've been building.

For students who can't draw to illustrate the meaning of a word (a key vocabulary building activity), cut out pictures from magazines and old books and have the individual decide if the picture "goes with" (represents or is associated with) the core word or not.

Much as Word Walls are used in literacy instruction, Zangari (2013) suggests creating a Core Word Wall with the core words that have been learned. Keep adding to it. You can make this out of a tri-fold science fair display or use manila file folders glued together.

Create core word cards and see how many phrases and sentences the individual can make out of them. This will increase as you continue to add core words. As descriptive words are added, they can be used to elaborate on a concept.

Create core word books that include those words that are used most often in a variety of situations. Have the individual find pictures and words to put in the books. It is easy to create books around descriptive vocabulary (i.e. colors, small) and spatial location concepts (under, through). Other concepts are also easy to represent in books, such as like (things the individual likes) or happy/sad (things that make the individual happy/sad).

Create stories around each new word, in conjunction with previously learned words. Have the individual raise a hand, make a vocalization, or use some other signal when he hears you use the word. Use the word in different sentences and have the AAC user determine if it was used correctly or incorrectly.

Create books that revolve around specific concept vocabulary. Include pictures and even easy-to-glue-in objects or fragments.

Find pictures in magazines and books. Have the individual determine whether a picture represents a word or its opposite.

Ultimately, in addition to core vocabulary, we also need fringe vocabulary: those words that are more specific to situations or individuals. Their importance changes from context to context and from person to person (e.g., evaporation, condense, pyramid). While we use fringe words about 20% of the time, students probably use fringe words more often in classroom content situations.

Fringe vocabulary needs to be added to AAC systems without disturbing the stability of the core words. With communication books, this usually means adding

pages of fringe words above, behind, or to the side of the core word board; in high tech devices, these are the pages to which users may need to navigate in order to have a more robust and specific vocabulary.

## How and Where to Begin?

There are a variety of schools of thought about how to begin to provide intervention and where to begin with AAC.

Many believe that it is necessary to start at the child's level in order for them to develop functional communication. While there are NO prerequisites to communication, many believe there is a logical order of developmental sequence (with the exception of many practitioners of applied behavior analysis and consistent providers of aided language stimulation). This leads to underestimation of the learner and restraints on the system provided.

The research shows that teaching words with a variety of uses and functions for communicating is important for AAC users to become effective communicators. Unfortunately, too often the first thing taught to children with complex communication needs is nouns: the focus is on meeting basic wants and needs, or avoiding behavioral problems by providing what the child wants to ask for. However, a close look at the child's environment shows that, for the most part, basic needs and wants are met, and caregivers know what the child wants when it is a concrete or preferred item or activity. As a result, the AAC user ends up being able to label items without being able to tell whether he likes them or not, wants them or not, has a problem with them or not, needs them moved, wants something different instead of them, or had one of them yesterday.

The second thing often taught to children with complex communication needs is specific sentence structures, whole message units, and/or specific carrier phrases. The result is that they have little opportunity to learn language structures, little opportunity for spontaneous generation of novel utterances (SNUG), and little opportunity to project their own intent upon messages; additionally, they have artificial-sounding speech or voice output.

Some of the first phrases taught to AAC users are "I want," and "I see." But how about "I don't want," "Go away," "Leave me alone," "Something different," "I need a break," "Need help," "He's bugging me," "Want to go," or "It mine."?

Students with complex communication needs require a sufficiently robust communication system to be able to communicate all of their needs, all of the time. Building that AAC system, and teaching learners how to use those words, is the biggest component of AAC. The AAC system needs to have built into it the

structures of complex language in order for the user to move beyond basic functional communication – and a system built for a very beginning communicator needs to have a way to grow with the learner, in order to accommodate the kind of growth of linguistic skills that is seen in typical learners.

This growth of language development proceeds in essentially the same path in most typical language learners. It should be the basis for AAC intervention that this path has consistency for all language learners, even while realizing that not all AAC learners will proceed on exactly the same path. While it cannot be predicted in very young children how their language will develop, it should be assumed that they will develop language “normally.” Because learners with disabilities may end up with an ever-increasing gap between their current level of language development and that of their peers, it is crucial that intervention not maintain them at a pre-communication skills level.

Intervention needs to constantly be monitored to ensure that it is adjusted to provide constant progress in skills. It is important to continually work with the learner in his zone of proximal development – that level of development that is the difference between what he can do independently and what he can do with support – to promote learning. Intervention should then proceed to move the learner through the transitions to use communicative intent to communicate, increasing those intents significantly throughout; then to increase semantics and develop syntax, combining words to increase meaning and complexity; to the stage of phonological awareness development, where AAC systems need to provide a way for learners to develop early literacy skills.

Monitoring intervention for learners with significant disabilities needs to constantly and consistently assume competence. Intervention strategies should be adjusted to promote progress rather than assuming the learner cannot learn the skill.

Johnston et al (2004) summarize some of the challenges and issues that should be considered when supporting AAC learning in these learners. They note that when the learner does not appear to be learning to use the AAC system, partners should consider the response effort required, the rate of reinforcement provided, the immediacy of the reinforcement, and the interaction of such variables. When it is the communication partners who are not using the system, these same variables should be explored. When the AAC learner is instead using unacceptable communicative behaviors, intervention should seek to maximize the efficiency of the more appropriate communication response and minimize the efficiency of the inappropriate response. Any environmental contexts in which the inappropriate responses occur should be explored and adjusted so that the efficiency of an appropriate response is maximized.

Effective intervention means providing structured opportunities to communicate, providing these opportunities over and over again, providing these opportunities in multiple contexts, and providing sufficient vocabulary to make these opportunities meaningful.

Students with significant communication needs must receive numerous – and highly structured – opportunities: research tells us 200 direct opportunities per day. Incidental learning opportunities are not always effective for acquisition of new forms. (There are, of course, exceptions to the rule, but these tend to be students whose potential for language acquisition was severely underestimated.)

Structured opportunities for communication should include the discriminative stimulus: what the partner says or does to elicit a response. For example, in the Model – Expectant Pause – Prompt – Respond model of input, the Model and/or the Expectant Pause are the discriminative stimulus; the response is what the AAC user then says or does, with or without a prompt. The consequence is the feedback the communication partner gives. This can be a continuation of the interaction, a repetition with or without recasting what the AAC user has said, a reinforcing phrase for what was said.

These opportunities should be integrated into the everyday activities and interactions of the individual. They should be provided by everyone who works with the student, as well as at home by all caregivers and other communication partners.

The communication demands of each type of interaction are significantly different. The AAC user/learner needs to learn and develop the skills needed to meet these demands, while simultaneously learning language and learning to operate the AAC system.

## ROUTINE INTERACTIONS

Many – if not all – early learners learn best when interactions are predictable and repeatable. This is especially true for individuals with developmental disabilities and Autism Spectrum Disorder. (It is also true for typically-developing very young children.) There are many routine interactions throughout the day that follow logical and predictable sequences and rely upon the standard verbal exchanges of those involved in the routine. This may be found in all of the daily caregiving and playing interactions of infants and young children, and this persists in the daily living activities of older learners with disabilities.

Use of these routines to establish and build language skills involves development of comprehension and expression through use of frequent, predictable language targets in the context of functional or motivating activities. Use of relatively stable

communication opportunities, with consistent and organized models and cues, builds knowledge of what to say and how to say it during these routines: a “script” is developed for how to interact in the context.

Routines revolve around a topic. They involve both partners attending to the topic and taking part in the routine in their stable “roles,” a predictable sequence, and can eventually incorporate variation that is planned and structured. Routines can be as simple as using a single-word response in a play or care routine, or as complex as retelling a story using a routine story template. They must be meaningful and motivating. Once the learner is familiar with using the routine responses, those responses can be expanded.

Both the partner and the learner need to be engaged in the interaction. The sequence of events for taking turns in the routine interaction needs to be consistent for stable, repeated learning. The roles of each partner and the repeated responses need to be consistent – again for stable learning. However, the partner needs also plan for some variation in order to expand what the learner is able to say, and for him to grow linguistically.

## SPONTANEOUS INTERACTIONS

More spontaneous interactions can also be used to foster language growth. A naturalistic language strategy is any spontaneous instruction that happens during the course of a naturally-occurring interaction. Naturalistic teaching takes advantage of routines, but also of spontaneous engagement.

Naturalistic strategies are child-centered, and focus on following the learner’s lead, rather than being partner-driven. Instead of developing routine scripts, naturalistic strategies are less structured and have no order to the target responses. They can be used in any interaction – most often in play. Naturalistic strategies are found in the routines described above, and also in a variety of other teaching methods.

The elements of naturalistic intervention include creating an environment that “invites” or tempts communication. The environment can be engineered to create learning opportunities:

- Items can be placed out of reach or in difficult to open containers.
- Routine interactions can be interrupted, providing the temptation to communicate.
- Partners can do something unexpected or illogical.

Attention is another element of the intervention. Using an activity that is meaningful or motivating to the individual helps to gain and keep their attention.

A critical element of intervention is the partner’s

ability to wait and to control his or her output. The partner should not anticipate the individual’s needs, but should pause in speaking, waiting for the learner to “say” something.

The partner should also use natural input such as modeling: providing a model of what the AAC learner should say in an appropriate format for the learner to imitate. Modeling can include both the partner talking about what he is doing, or talking about what the AAC user is doing.

Talking about what the child is doing is called *parallel talk*. This provides the learner with labels for what he is doing that he can then use. *Self-talking* is the partner talking about what he is doing. It provides labels for the partner’s actions. *Elaboration* involves saying what the AAC user said, but in a slightly more complex way (either semantically or syntactically).

Naturalistic approaches to intervention include

- Milieu teaching – a conversational approach to teaching that uses the learner’s interests as the basis for interactions and uses the opportunities that occur in these activities. It is an Applied Behavior Analysis (ABA) approach.
- Incidental teaching – the partner takes advantage of naturally occurring situations to provide instruction/intervention. The environment can be engineered to create these opportunities. This is also an ABA approach.
- Natural Language Paradigm – this also engineers the environment to create opportunities. The partner waits for the learner to initiate a response and models if needed. This is also an ABA approach.
- Joint Action Routines – as described above, these are specific strategies to incorporate language learning into predictable repeated routines.
- SCERTS – this incorporates naturalistic strategies to build language and social-emotional growth.
- Hanen – also improves language skills through parent-child interactions.

Activity-based interventions (ABI) were devised in order to unite the diverse fields of ABA and developmental approaches to intervention. The key elements include use of routine, planned, or child initiated activities to embed goals and objectives, and logical use of antecedents and consequences to increase generative language skills.

ABI is considered a naturalistic, child-centered intervention. It is based on the premise that activities that are learner-initiated will be more motivating and engaging. The target objectives are embedded into all routine, planned, or learner-initiated activities and the partner uses scaffolding to gradually build ever more complex responses.

## A Word about Partner Training

There is often a belief that we can put the AAC system in front of the individual and he will use it – and if he can't use it, then he shouldn't have it. Schools and insurance companies both often expect the individual to be able to use a device, once provided, with minimal training on how to make it work.

In the case of some adults with acquired disorders this may be largely true. Cognitively intact adults with ALS who have lost motor control can usually learn fairly quickly how to operate the switches or eye gaze technology needed for them to access an alternative voice. Similarly, many AAC users with cerebral palsy have the cognitive skills to learn to use the AAC system quickly; one individual indicated that it took 3-6 months of consistent use to learn where all the words were located in a Word Power system, and to become comfortable with the motor patterns to access them.

However, not all AAC users have these cognitive and linguistic skills: in reality, few users are sophisticated enough to make the AAC system work for them immediately. Often an AAC user has to learn language and communication skills at the same time as learning to use the specifics of his system. What teachers, SLPs, caregivers, and other communication partners are here for is to teach him to use it; teach him language, and – as previously mentioned – teach the four basic competencies needed by AAC users (Light 1989): linguistic competencies, operational competencies, social competencies, and strategic competencies.

How well an individual develops competency with his AAC system is strongly influenced by the competencies of his partners, their degree of supportiveness, and any barriers they place in his way. Communication partners can either be a source of support or of impedance. The policies of the school environment, workplace, or living space can also be either supportive or hindering.

One example of a barrier is when school districts limit the use of the AAC system to the classroom, or to the building itself, disallowing the student to take the AAC system home with him for practice there.

Barriers may also exist when there are limited trained professionals available to provide services, or when insurance companies put limits on the amount of intervention services they will pay for.

Attitude barriers impede the progress of the AAC user when partners have low expectations of the user, when partners do not accept the AAC system, or when it is not believed that the AAC user can compete in natural contexts with others. Attitude support may be needed to provide a more positive, “can-do” message to foster development in the AAC user.

Knowledge barriers occur when there is not sufficient quality information available about AAC. Partners may not be appropriately trained; likewise, professionals

themselves may not have sufficient knowledge and training.

Skill barriers exist when AAC is not implemented effectively. This is one of the greatest causes of “abandonment” of AAC: when appropriate AAC intervention strategies are not applied the individual may become frustrated, and partners may not see progress. When partners fail to respond to communication attempts, the entire system can break down.

The AAC user's communication partners are one of the most key components of his learning to use his AAC system. Yet too often little attention and time are given to training these partners.

Binger and Kent-Walsh suggest four guidelines for assisting partners with improving their interaction skills. Having noticed that trying to change partner behaviors through providing information or suggestions and focusing on too many behaviors at once often fails, they suggest instead to:

1. Focus on the AAC user's skills and the partner's specific behaviors. Focus on what the partners are doing that does facilitate the learner's AAC use – this helps to avoid their defensiveness drowning out anything else you say. Then target exactly what the partner could do to facilitate better learner outcomes – and what exactly they would look like
2. Select specific user and partner skills. Focus the instruction on limited skills in limited contexts to experience success and build confidence. Define each skill explicitly, choosing the ones that are easiest to define and change first.
3. Practice the techniques with the AAC user before beginning instruction. This helps to make sure that what you want to teach will work and helps to define what it to be taught. It allows troubleshooting before the fact.
4. Start small, then expand the contexts in which the skill is used. Beginning with a very limited skill in only a very few contexts helps to keep the partner from becoming overwhelmed. Start with an activity that takes less than 15-20 minutes. Stay small. Then you can expand when everyone is experiencing success. Don't try to change too much at once.

Once the partner has mastered one context, then expand to another. Continue to select specific and familiar contexts.

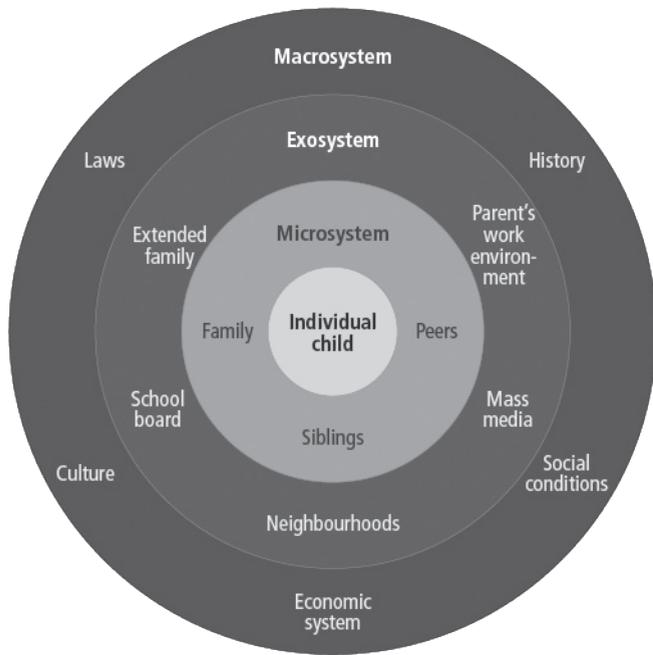
Studies (Douglas 2012) show that appropriate training of paraprofessionals resulted in increased skills of AAC users.

(A handout to use for partner training is found at the end of this session, developed by Maureen Nevers, M.S. CCC-SLP Vermont I-Team.)

Porter breaks communication partners down into

groups: those who need the skills to understand the user's communication, the skills to provide ALGS consistently, and the ability to teach communication skills are the first and most important group. These are the individual's key communication partners – the ones who need to learn most specifically the individual's communication responses and be most familiar with the AAC system – and these users will be prominent in providing aided language input. The second group is comprised of those who need only the skills to operate the system in order to understand the user's communication attempts. This is a significant distinction for the purpose of training.

Bronfenbrenner's (2006) ecological model puts the individual in the center of an ever-widening group of influences, including people and environments. Focusing on the individual includes identifying his strengths, skills, needs, and success with AAC. Linguistic, cognitive, motor, sensory status are all evaluated. But focusing on this information alone is not enough to predict future success with AAC. The individual does not exist in a vacuum. Rather, he lives in a wider context, with an environment that responds – or doesn't – to him in a variety of ways. Consider the availability of an AAC system in his environment, as well as the opportunities for communicating with the system. Finally, in the broadest sense, consider how people in his society view an AAC user; how much acceptance is there? How much is he included or excluded socially?



Above all, remember that the efficacy of intervention depends upon the communication partners' belief that the individual can acquire communicative competence.

## AAC Implementation Strategies

Teaching individuals to use AAC is an on-going process that needs to be participated in by all of the individual's communication partners. There need to be systematic strategies provided to AAC learners for organizing and using the vocabulary in the AAC system, and easy access to the wide variety of vocabulary needed to communicate effectively. There are several strategies that are common to teaching almost all AAC learners.

Best Practice Guidelines for AAC Assessment and Implementation require the skills and cooperation of many persons surrounding the AAC learner/user. The focus needs to continue to be on the development of communication and language skills throughout the process, without focusing solely on acquisition of skills to use high technology AAC devices. The individual's strengths, weaknesses, and needs, as well as the supports and weaknesses of his environment, all need to be considered.

The assessment process needs to be thought of as ongoing. Even where the individual is assessed in an isolated assessment center, the communication partners that continue to support him need to be constantly monitoring the process, the progress, and the barriers, making adjustments to the system or the intervention as needed.

Monitoring almost never ends. Both the individual and the technology change over time, often very quickly; this may not impact all users, but can significantly impact others. For example, one of the problems with high technology dedicated systems is the ever-changing profile of the computer and AAC industries. Sometimes, by the time an individual's system requires repairs, the device is no longer manufactured – or even supported – and a new device needs to be purchased, requiring a new evaluation report if funding is being sought through medical insurance.

Determining an appropriate system – one that matches the features of any given system with the strengths and needs of the user – needs to consider all variables. The system must be matched to the user's needs motorically, linguistically, visually, and motivationally, as well as to the supports available in the environment. Promote a sense of control as much as possible in the AAC user by including him in the process whenever possible. This may include the individual's ability to prefer (and articulate his preference of) one system over another, or simply to match the color of the device housing to the color of the user's wheelchair. Including vocabulary that is important to the user also needs to be a part of the matching process.

Implementation of AAC can be very challenging. This may be due to lack of acceptance or buy-in by teaching and support staff or by the AAC user, or due to the system not meeting the user's needs, or simply be due

to lack of training. An implementation plan – giving users and partners a roadmap to follow – is extremely helpful in keeping everyone on track. It is important to include frequent structured opportunities, instructions for taking very small steps one at a time, and training information and opportunities for partners.

## Aided Language Stimulation: AAC Immersion

Some AAC learners are not yet functioning at a linguistic level. It is still often believed that an individual functioning at the prelinguistic or presymbolic level of development cannot learn to use AAC. This assumes developmental prerequisites to AAC intervention – and this assumption is dangerous. All children communicate, even as babies. While it may take some time for their linguistic learning to become apparent, they are learning during this crucial period. The input provided to them during this time is crucial for later language development. The same input needs to be provided for children with disabilities.

According to Harley (2008), communication is “the transmission of a signal that conveys information.” Using this definition, it is easy to see that all children with complex communication needs communicate. What a child does to communicate is largely dependent upon his environment, and how the environment reacts to his communication attempts has a significant impact: if the environment is responsive and reinforcing, the child continues his communication attempts.

A child’s early attempts at communication fall into three basic functions: behavior regulation (requesting, protesting), social interaction (requesting routines and comfort, greeting and calling, requesting permission), and joint attention (commenting, requesting information). However, too often AAC systems for beginning communicators focus on the first intents – gaining food, drink, the bathroom – basic requests. Social engagement and interpersonal connections are often thought to be unnecessary or too difficult for early communicators. But joint attention is at the heart of all interactions and the door to conversation, and as such, it should be a focus of intervention every bit as much as making wants and needs known.

Von Tetzchner (1997) and Porter (2009) both refer to the differences in language environments between typically developing children and AAC users. Typically developing children are surrounded by examples of others using the communication systems they are learning: typical 3 year olds in middle class families hear 6 million words per year. Typical deaf children with deaf parents see 6 million signed words per year. Typical AAC users see others using symbols to communicate effectively approximately 0 times per year.

“The average 18 month old child has been exposed to 4,380 hours of oral language at the rate of 8 hours/day from birth. A child who has a communication system and receives speech/language therapy two times per week for 20-30 minute sessions will reach this same amount of language exposure in 84 years.” (Jane Korsten)

Hart and Risely (1995) found that typical children in working class families hear approximately 1,250 words per hour and accumulate a listening vocabulary of 6 million words by the time they are 3 years old. Mirenda (2008) then posited that children with ASD who are using AAC need to be presented with, literally, hundreds of opportunities to have symbol use modeled throughout the day.

According to Von Tetzchner (1997), “the difference between their own expressive (and for some also receptive) language and the language used by significant people in their immediate surroundings” is a critical factor in the acquisition of language for AAC users. There is an assumption in all major theories of language learning that the individual is surrounded by others in the environment using the same language system. Even in second language learning, the importance of immersion has been noted: learners of second languages need to participate in an environment that exposes them – immerses them – in experiences with that language in order to become competent communicators.

The opportunity to be immersed in an environment using aided language is very rare. For AAC users and learners, there is little if any opportunity to even observe others using an AAC system, let alone be immersed in an environment of AAC users. But without this, children learning to use AAC systems constantly need to figure out how to use a language system they have rarely – or never – seen used to communicate. There is a great discrepancy between the language environment to which they are exposed, which uses verbal language, and the language system they are being asked to use, which is a picture-based language. Not having models of others using aided language results in the student not knowing how to use a language system they have never seen used.

Aided Language Stimulation (briefly discussed above in the contexts of PODD and Language Intervention Techniques) attempts to provide the same kind of language learning environment that is available to verbal children for children who use aided symbols.

To this end, those interacting with the user need to use the user’s communication system – or a similar system – when they communicate to him, as well as use the system to model to the user how to say what he wants or needs to say in a variety of contexts. (This may depend on how possessive the AAC user is of his system, or on the availability of multiple system components: PODD book templates, for example,

have a “Group PODD” that can be used by the teacher. While the system components are the same and the operational guidelines are the same, there may be differences in the number of symbols per page or the availability of specific symbols based on the specific AAC users in the classroom.)

ALgS requires that the needed symbol vocabulary is available in the environment at all times, that the aided symbols are used for genuine communication throughout the day, and that partners are trained to use the aided symbol systems competently. (Note that it is very difficult to provide aided input when the AAC system is largely comprised of whole phrase messages in a low-tech system. The range of vocabulary available in these systems is minimal, and not nearly sufficient to provide input throughout multiple environments and contexts. The system’s limited availability of visual space restricts the number of words that can be used at any given time. When the number of symbols per page is further restricted by difficulties with visual or motor access, it becomes impossible to use such a system to provide models of picture communication use.)

Aided language systems include use of visual symbols for expression, for comprehension and conjunction with speech, and use to represent the organization of an activity, script or schedule. The key to aided language systems is the consistent use of symbols for two-way communication by all communication partners in all environments.

Talk to the user while using their communication system to communicate to them. Highlight key words and provide a model that is linguistically one step beyond how the user is communicating. This goes beyond teaching which symbol means which word, which has been found to be relatively worthless for communicating. Aided language environments provide genuine purpose for the symbol(s).

For beginning communicators, using ALgS adds symbols to their environment and to their intents. There are times when communication partners are unsure what the individual’s intent of a movement or vocalization is. Assigning an intent to it and responding to that intent can teach the user to associate the two and begin to develop more intentional communication.

Porter and others stress using self-talk and operational talk with beginning communicators. Self-talk allows them to hear the thought processes involved in making a decision about vocabulary. Using operational speech – talking about what to do with the system to get to the word or message wanted – allows them to hear what the process is and begin to understand the operational system.

Use of “verbal referencing” – talking to the individual about what is happening while the partner searches for a symbol or navigates to a page to find a desired

word and explaining how (x word) can be used in (y) context – demonstrates the process and the strategies, helps with the individual’s understanding of others’ messages, and provides models for their own expression.

Partners should give users feedback on the effectiveness of their communication attempts, and provide message expansion. Also provide recasts – a modification of the user’s response that corrects an error or provides the next linguistic step.

Partners should ask themselves: Am I modeling a range of different communication intents? Am I modeling different types of messages? Am I modeling using the system to interact, have a conversation? Am I modeling strategies for when I make a mistake or the other person doesn’t understand me?

Once they provide a model of a target language concept, partners need to wait – and to signal to the user that they are waiting – for a response. The “expectant look” (discussed above as “expectant delay”) has come to be the accepted term for this signal, and can be manifested by the cocked head, raised eyebrow, wide eyes, and even shrugged shoulders. It lets the individual know that their communication partner is waiting for them to take their turn. If there is no response from the AAC user, the partner should know the procedure for prompting a turn. It is important to use this strategy in the most naturalistic communication exchanges possible, and not just for asking and answering questions. The AAC user needs to learn that communication is not about “testing” whether or not they can answer the question, but about taking turns to exchange messages. The more the AAC user learns to respond to a signal of expectation rather than a specific question, the more natural the communication exchange becomes – it becomes a conversation.

Comprehension and expression are promoted through this use of models during motivating and frequently occurring activities and routines. The end result is that the individual’s knowledge of the vocabulary and of language skills will increase. There should be increased mean length of utterance, better syntactic skills, and more varied use of communication functions.

Aided language use can be time consuming and difficult to become comfortable with, but it is crucial to the individual learning to use his AAC system. In the process, communication partners begin to get a feeling for what challenges the user faces.

Significant information about how to use ALgS is provided to users of the PODD communication books. Discussions of ALgS have been in the literature for many years (Goossens, Crain, & Elder 1992, Ronski & Sevcik 1996, Cafiero 1998, Bruno and Trembath 2006, Mirenda 2009). Research for its use dates to the 1990s and it is evidence based practice for AAC learning.

PODD developer Gayle Porter insists that use of ALgS is at least as integral a part of the AAC process as determining the functions and vocabulary the system contains.

## Creating and Providing Opportunities to Use ALgS

Research tells us that routines are at the heart of symbol and language development. A variety of strategies that emphasize use of routines to develop language were discussed above.

Routines are sequences of actions or events that are repeated over and over again. Every routine can be broken down into smaller and smaller components. Each of these components is influenced by the responses and reactions of those involved. The reactions and responses become symbols (signals that are interpreted the same way by at least two people) that are used in this interaction to signal to each other. When the routine always follows the same sequence, the signals between the two people involved become shared symbols. Routines help us build symbolic awareness, and symbols become communicative when they come to have a more standardized or conventional meaning among a larger group. This helps us realize why it is important to develop routines in thinking about intervention for AAC (Lonke, 2014) and for understanding the impact of Aided Language Stimulation.

Once the practice of Aided Language Stimulation to introduce word use to the individual has been established, teaching activities need to be implemented to teach the new words. Facilitators need to teach explicitly, then elaborate on the meaning and use of the word through a variety of meaningful activities. The AAC user needs to be exposed to the word repeatedly and consistently.

Opportunities to use aided language input and elicit AAC use occur all throughout the day. As previously mentioned, research has shown that it takes 200 opportunities per day for an AAC user to learn to use their system effectively. Partners often think that this is a huge number that cannot possibly be achieved. However, they are usually surprised at how easily 200 opportunities adds up. Within the context of every interaction is at least one, if not multiple, opportunity(ies).

Consistently creating communication temptations (sabotage, or engineering the environment) increases those opportunities beyond that that naturally occur. This was discussed above, when talking about using naturalistic intervention strategies. Engineering involves arranging – or rearranging – the environment so that the user feels the need or desire to communicate in order get what he wants, whether that

is an object, person, activity, or feeling.

Requesting can be promoted by putting a desired item out of reach, or only providing a limited amount of it, or manipulating the environment in some other way so that the AAC user needs to make a request. During a snack or other eating time, partners can create the need to model requests, demonstrating, and directing with words such as “that” “that one” “want that” “give that” “want more” “I want some” “open it” “help please” etc.

Comments can be engineered through the use of deliberate miscalculation or error. Opening a favorite book upside down to read it, crashing the trains or cars on the play mat, rolling the ball in the wrong direction, putting a puzzle piece in the wrong place or orientation are all examples of ways to misguide the situation, providing opportunities to comment “Oh, no!” or “Not that,” or “Help.” During any play interaction the partner can model a comment (it fun, this is fun, like, I like this, look, look at that, etc.).

Other examples of creating opportunities within the environment include:

- making a favorite item inaccessible – don’t automatically offer the item when the child reaches or cries or tugs at you. Provide an example of “Help” or “Want” or “Give”
- giving small portions – be careful with this strategy, so as to avoid frustration. Cut an apple into pieces and don’t provide the whole apple at once. On the other hand, don’t provide only 1/8 of the apple at a time, hoping to maximize communication opportunities. Model “Give” or “More”
- creating a need for assistance – place a desired item into a sealed container, or out of reach; move the remote control for the TV or DVD player. Provide models for “Help” and “Want” and “Go”
- interrupting a favorite activity – blow bubbles only one or two times and wait, watch a part of a show then pause it, provide two colors of crayons but not the rest. Provide models for “More” and “Go” and “Do”
- offering something the individual does not like – model “No” or “Not” or “Different” or “Stop”
- providing an activity with a part missing – model “Want” or “Give” or “Help” or “More”
- offering surprises – these can be good or “bad” surprises. Usually, the unexpected mess, such as dropping the bowl of popcorn or box of puzzle pieces, provokes a reaction. Model “Oh no” or “Yuck.” Good surprises can also provoke a reaction, of course: bring out a favorite item, snack, or activity. Model “Yay” or “Mine” or “Good”

After modeling, the partner then waits with the expectant signal and, if needed, prompts a response.

Continued modeling, waiting, and prompting forms a continuous loop of communicating and creating communication opportunities. Model, wait expectantly, prompt.

## Prompting Strategies

Sometimes individuals require some prompts or cues in order to engage in communication, particularly if the skills or vocabulary is new or less motivating. Prompts should be used very carefully and mindfully: partners should make note of the prompting strategy and level used, and be very precise in the wording used.

There is a difference between a prompt and a cue.

*Cues* are the stimulus that the partner or environment provides prior to the communication response. It can be environmental, such as a pause in the DVD player that cues the student to make a request. It can be personal, such as the partner asking, "What do you want to drink?"

Move an item into the environment as a cue that it can be talked about. Point to the communication system to cue that there might be something he should say now. Provide a verbal cue about what he might say and how. Use an indirect cue to focus the user's attention on an event he might want to talk about. A more direct verbal cue will tell him what to say. Verbal referencing as a cue outlines how to communicate a message. Accomplice suggestion cues are provided when the partner suggests possible messages. A light cue can be used simply to focus the user's attention: this can be general (focused on the AAC system) or specific (focused on the specific target message).

When the individual needs help responding to the cue, a *prompt* may be used. The prompt may be verbal or signed. When verbal prompts are used the words must be specific, and consistent from partner to partner. The prompt may be pictorial or written. Picture cues or word cards can be used as a prompt. Gestural prompts are as simple as pointing. Modeling prompts provide a demonstration of what the individual should do. Physical prompts can be light (a touch or tap) or full (hand over hand, also called manual guidance).

It is always important to allow for a response lag, or wait time, before providing a prompt to the individual. Account for the fact that processing of the initial stimulus may take time. Additional time may be necessary to initiate the motor movement needed to respond. Keep track of the response latency, to see if and how it changes over time or in different situations.

Inserting that wait time is crucial. Too often communication partners do not wait long enough for the individual to respond. They forget to consider the processing lag, motor response delay, or formulation

time needed. They may be so anxious to get the individual to communicate that they prompt too quickly and too often.

Most often the least-to-most hierarchy of prompts is used (moving from the least prompting – such as gesture – to most intrusive – such as manual guidance). However, if the individual can follow a gestural cue, prompting should always be done with a time delay method, which increases the time between the original stimulus and the gestural prompt. First, most AAC users require extra time to process and begin to compose and make a response. Second, this promotes errorless learning and reduces the user's dependency on prompting (some students, especially those with autism, can easily become prompt dependent).

## Contextual Teaching and Active Participation

Everything we know about learning theory suggests that contextualized teaching is best for typical and special learners alike. While typical individuals learn through decontextualized activities more and more as they progress through school and through life, many AAC users continue to rely upon contextualized learning far longer. While we must provide decontextualized practice and generalized experiences, initially the AAC user will learn most successfully within the context in which they will need or want to use the word. All of the naturalistic and routine-based interventions discussed above rely on the meaningfulness of context.

Providing word learning through use in context actually strengthens generalization. By providing opportunities to use the word in a context in which the individual will want or need to use it, the chances are increased that he will be able to use it when the opportunity or need arises.

For some learners, such as those with Autism Spectrum Disorder or developmental disabilities, the need to provide word learning in context is even stronger. These are learners who often will not successfully learn to use words functionally out of context. For these learners especially, learning by doing – active participation – is crucial.

Teaching vocabulary to any individual in any context requires using a variety of multimodal strategies. Evidence based vocabulary instruction (Marzano) involves interacting with the new word in a variety of ways, including defining, illustrating, using in context, explaining through words or pictures, creating art or music that defines or describes the word, and discussing the word with others.

Many of these strategies are obviated by the fact that the learner is nonverbal and may not have sufficient vocabulary in his own lexicon to describe or define other words, particularly core words. The AAC user may also have physical or motor limitations that restrict ability to draw, paint, or create nonverbal representations. For the AAC learner the word is more often used in context initially to provide definition, rather than writing a definition or sentence. But many of the classroom and intervention strategies used for all learners can be used with those beginning communicators using AAC.

In classroom and therapy-based instruction it is important to build a variety of contexts for using the new word in the environment. Create thematic lessons. Have a theme of the week or the month. Find ways to use the new words in activities that revolve around the theme. Thematic instruction has many advantages for students with language difficulties, including the fact that keeping the content vocabulary consistent over a period of time provides more opportunities to learn that vocabulary as well as the specific word(s) being targeted. It allows the learner to focus less on a constantly shifting array of content vocabulary from multiple themes or topics, and focus more on the communication word(s) to be learned.

Themes are often easy to establish for school-aged learners, based on the classroom or district curriculum. Have a “word of the week,” where the focus is on the word to be learned, rather than the activity or related vocabulary. See how many opportunities for communicating with a single word can be created in multiple activities. Read books that use this word often. Let communication partners outside of the intervention environment know what the word is, so that they, too, can focus on use of this word.

Mine classroom routines for opportunities to teach new words. Think about the interactions that take place – or can take place – around and within those routines. Early vocabulary is easy to build into familiar routines, such as greetings, requests for help, labeling and requesting, commenting on the weather or the ride to school, answering questions, etc. It is possible to build more complex vocabulary into those routines, as well: beyond the ability to “wash” or “clean” can come “sanitize” and “disinfect.”

There are many resources available other than the Pixon PLLAN for teaching beginning core words. While it may be easy to think of ways to use “go” “stop” “more” and even “open” and “close,” it might take some work to think of all of the ways to use “get” (get up, get it, get going, get me, get wet), “turn” (turn it, turn me, turn on, turn that), “on” (put it on, turn it on), or “make” (make cake, make puzzle, make a call, make mess, make noise, make any specific shape or color with crayons or play doh).

Within any given activity, partners can move the learner from one language stage to the next. An all-time favorite activity of young children is blowing bubbles. At the one word level, target responses can include: *blow, me, you, big, more, pop, catch, go*. At the two word level, target responses can include: *me do, you blow, pop it, catch it, want more, blow big, got it, my turn, get it, all done bubbles*. At the phrase level, responses can include: *I want more, you blow more, my turn do it, blow big bubbles, I catch it, get more bubbles*.

Providing activities that are motivating is the key to learning: if activities are not meaningful and motivating, the individual is not engaged. One way to make sure that the activities for learning are motivating is to use the individual’s key interests. Often children, in particular, have a key area of interest, such as the current favorite Disney princess, Thomas the Train (or all trains), sharks, Legos, sea shells, airplanes, empty boxes.

Paula Kluth, in her book *Just Give Him the Whale*, provides a number of anecdotes about how AAC use in students with ASD and Asperger syndrome was significantly increased by providing users with vocabulary and activities that were based on their key interest. Rather than trying to decrease a student’s fascination with a specific topic that consumes much of their interest, she advocates for using it as a tool to engage him in educational activities.

Provide the student with activities that involve the area of interest. Create communication opportunities within these activities and model using appropriate vocabulary within the activity. The focus can be on learning to use a new word for a beginning communicator, but can also apply to learning a syntactic structure or figurative language. Use of motivating themes will engage the individual more and increase learning.

As intervention moves to less contextualized activities, build personal interest story books using Powerpoint or similar software, story book creation apps (Pictello, Storybook Maker, Book Creator, Story Patch, Story Creator and others), or TarHeelReader.org. Create books that illustrate vocabulary using illustrations that are relevant to the area of interest. Create stories around the adventures of the character or object using the targeted vocabulary.

Eventually adding decontextualized activities serves a couple of purposes. First, it builds the speed and ease with which the AAC user can locate vocabulary in the AAC system. Working on fluency outside of communication contexts relieves the user of the pressure to find the word while a partner is waiting. Also, decontextualized practice provides additional generalization of and practice with using the word. Practice and more practice is the answer to using vocabulary in the AAC system.

## Functional vs. Therapeutic Communication Intervention

Depending upon the type of AAC system provided and the amount of Aided Language Stimulation effected in the environment, AAC users may already be developing a variety of communication functions. However, this is not always the case. Too often intervention plans focus on requesting and rejecting and stop there, having met the user's basic needs.

Just a quick look at the aforementioned behaviors can tell us that requesting and rejecting don't meet all communication needs. Individuals have a need to tell us when they are uncomfortable and unhappy, when something is wrong, when someone is bothering them, when they feel good about something, and more. Making an intervention plan that looks at the individual's day, the types of communication his peers are using at each of the segments or activities of the day, and determining where he is unable to approach the same, provides invaluable information for AAC planning.

There are a few basic reasons to communicate that span a wide variety of intents and message types. Students communicate to indicate a preference or desire, to make a choice, to request an object or activity/action, to comment, to share, to request information or escape or attention. They might also use language to make up stories, to assert their independence, and to express feelings. The key is to have language available for them to use in any of these situations and to make sure that the symbols they need are easily accessed.

Communication intervention needs to be as functional as possible, rather than removed from real-life contexts. Functional communication with an AAC system can include making choices, making requests, responding to personal questions, asking questions of others, stating your needs, commenting on some experience, and more.

Therapeutic activities, on the other hand, are those that improve a specific communication skill. Sometimes it is necessary to practice these skills removed from their usual, natural context, or in contexts that are engineered to provide an opportunity to practice the skill with support/scaffolding, feedback, modeling. In therapeutic activities the SLP practices with the AAC user using specific vocabulary to describe or give directions, learning how to sequence steps to a task or the order of events in a day.

For AAC users to become competent communicators, they need both functional and therapeutic activities. They need to learn how to use their AAC systems to communicate with others effectively and efficiently. They also need the same kind of practice in specific language skills that we provide to other students with language delays and disorders. And for many of these activities, there is no difference in the content for AAC

users, only in the mode of how materials are presented how the individual responds to them.

In general: keep intervention activities fun and novel and student-centered or student-led. Giving students power to control aspects of the situation teaches them the power of communication. Many AAC users have not before had experience with the power of communication – their environments have been controlled for them. Let them control what activities to engage in, the order in which they do them, and the pace of the activity. Give them vocabulary to express both positive and negative opinions about the activity and ask questions about the activity. Use the student's own interests in meaningful activities. Sometimes, just do something different and unexpected. Attention is enhanced by the novel or unexpected. Remember; motivation is key!

Also remember, you can't teach language in discrete trial training (Lovaas 1992). You can build skills and develop vocabulary in therapeutic interventions, but language must be developed in natural contexts. Too often the AAC system is separate from the context or activity. Rather, AAC use needs to be infused into play activities. At any level of intervention the partner needs to respond to the user's communicative intent, expand on the message appropriately with both speech and AAC, and continue providing meaningful opportunities within the activity to communicate.

### Pull out or Push-in?

This is almost always a loaded question. Many parents still believe that their child isn't getting the full benefit of intervention if it's not 1:1 with the SLP. Many teachers still do not want speech-language pathologists in their classroom. Many SLPs are still far more comfortable with traditional intervention activities than teaming up with teachers in classrooms.

Effective intervention means providing structured opportunities to communicate. Students with significant communication needs must receive numerous and highly structured opportunities. When faced with a school environment and an IEP that calls for pull-out services, intervention can easily provide systematic introduction of specific vocabulary and syntactic structures that can then generalize to people and items in the intervention, classroom, and home environments.

Communication must always have a purpose, and it must be motivating at least a good deal of the time. Beginning with AAC learning by responding to curriculum questions or demands in a task or activity that is not interesting often results in the AAC user shutting down. Intervention targets can focus on vocabulary, or syntax, or pragmatics, or operational competence, but intervention must also focus on keeping the AAC learner engaged.

To increase social communication skills, it is very helpful to have a group: it's difficult to increase social language skills in a 1:1 session. Create classroom or group sessions that simulate typical peer interaction settings, such as going to the store, a party, or a "play date." Provide opportunities to interact in real life situations in which the AAC learner is interested.

Create opportunities for learning routines, for learning the language needed within the routine, for learning how to regulate behavior and use appropriate language responses.

Environmental Communication Teaching (ECT) was designed to help classroom teams deliver "... communication intervention within the context of existing natural environments." ECT was designed for students who either already have some minimal competence in operating an AAC system, or who can already use AAC to respond in some structured "eliciting" situations, or who demonstrate the desire to communicate, show strong preferences or dislikes, or attempt to maintain participation in 1-2 activities or events.

ECT integrates three intervention tools/strategies: use of structural analysis or modification; use of facilitative cues, prompts, feedback; use of AAC approaches. The basis of ECT is that activities are the basis for communication, and that partners need to understand how they can facilitate communication and what's involved in intervention.

- Structural analysis: knowledge of the various social contexts for communication interactions, how these contexts are regulated, and how communication functions are used within them. From this, there are developed "activity-based objectives."
- Cues, prompts, feedback: used to facilitate initiation of age appropriate communication within activities by the student. These are used in all opportunities/ occasions for communication intervention within the environments in which the student is involved.
- AAC approaches: integration of AAC strategies and systems into the planning and implementing of AAC intervention

In ECT the first step is to connect the activity with the type of communication target. Then the activity's steps need to be planned (i.e. how is the activity initiated, who begins it, what needs to be said to continue the activity or end it, etc.). Target activities should be process oriented rather than product oriented for best communication opportunities.

Determine the communication functions and behaviors. Then arrange the environment – the naturally occurring environment; not just "AAC time." Use various types of sabotage. Use good partner strategies to encourage – rather than inhibit – communication (i.e. don't anticipate needs, but do

provide choices, provide models of AAC use, pause to allow communication attempts, etc.).

ECT includes used of two prompting hierarchies.

#### ***Spoken Prompt Hierarchy:***

1. Set environment -> pause.
2. Ask open ended question -> pause.
3. Give partial prompt -> pause.
4. Request for communication -> pause.
5. Provide full model -> pause.

#### ***Non-Spoken Prompt Hierarchy:***

1. Set environment -> pause.
2. Gesture -> pause.
3. Point to 2 choices -> pause.
4. Point to expected response -> pause.
5. Provide full model -> pause.

## **Intervention Sessions**

Preparing adapted activities that include appropriate visual cues and motivating topics does take a little extra time and thought. In speech-language therapy a lot of time is spent increasing vocabulary skills through book reading, use of thematic units, concept mapping, and a variety of other explicit instruction techniques. All of these apply to AAC users as well, and they are particularly important to AAC users who may not have had the same life experiences as their peers. Remember, vocabulary knowledge is second only to decoding in importance in developing reading skills. And all students need to develop literacy skills.

Some therapists create real-life situations in therapy sessions in order to practice vocabulary with students. That may include setting up a pretend birthday party in order to learn not only the vocabulary related to birthday parties, but also the social conventions, the way to interact with others at a party, how to relate to the person having the birthday and receiving the gifts, how to handle being the one not getting gifts, taking turns in games, asking for things politely, etc.

iPads have become increasingly useful in setting up some of these contexts to talk about and iOS apps are being used increasingly in intervention. Many apps designed for children's entertainment provide excellent opportunities for generating language. These apps provide the context for interactions that are "real life" situations created in a virtual world. Apps such as Toca Tea Party, Toca Kitchen, Bamba Burger, My Play Home and others create contexts in which therapists can promote language development from simple core words to descriptive and locative concepts and increasing syntactic structures.

(The play apps should not be on the same device that the individual uses to communicate: it is not possible to communicate with the AAC app while in the play app, it is not practical to switch back and forth between apps, and it violates the concept of a

dedicated AAC device, which the iOS device must be if it is being used for communication.)

The Toca Boca apps are often used by SLPs to generate language in therapy sessions. They can be used equally well to practice core word use and phrase or sentence use. (<http://tocaboca.com/apps/>)

For example, the Toca Tea Party provides multiple opportunities to:

- make requests (want that, want tea, want this one, not that one, want cake, want more, want different one, want punch),
- comment (like that, don't like, you eat, I eat it, uh oh, all done, need more, it spill),
- direct (give me that one, put it there, put, give, have, move, wipe, eat, drink, take a bite, wash them),
- describe (pink one, green, flowers, red and white, pretty, little, messy, dirty
- question (want more? want this? which one? you finish? play again?)

Bamba Burger provides players with a burger restaurant where one can make a custom burger: choose the bun, cook the burger, and choose the toppings. All of these options provide lots of opportunity to make requests, make comments (sardines on your burger? "Yuck."), give directions and descriptions, ask questions, and more. Players also choose style of fries, flavor of soda, amount to pay. (<http://www.bambatown.com/>)

Play Home is a virtual doll house complete with a family of virtual dolls and rooms full of furniture. Just like any doll house is used in intervention to elicit language, the app can be used to give AAC learners the opportunity to give directions, describe locations, ask questions, and more. (<http://www.myplayhomeapp.com/>)

Above all, talk about what you are doing throughout activities. Providing good language input throughout activities, talking about words as you are teaching them, talking about why a word is used here, but not there, or can look like this but not that – all of this is what builds language skills.

Almost any app can be utilized to generate language interactions and increase target skills. Drawing, felt board and sticker book apps can be used to create scenes, which can then be the focus on language interaction. By choosing apps that allow the user to explore them and interact with them, apps can be integrated easily into creating motivating and reinforcing activities to build language. Many apps also offer the advantage of offering specific academic topic information and fun. In this way students with limited language, reading, and writing skills can interact with and participate in classroom activities.

Use existing classroom and intervention session

routines to also give a context for social language, such as greetings and partings, social manners, conversing during breaks. Use class and session routines to create scripts that can be used over and over again. Teach the AAC user what he needs to say to direct the actions of others, to gain others' attention, to provide information, to direct or explain routines, to tell about things or events.

Teach AAC users how to participate in classroom tasks. This is especially important when classroom tasks are a group or class of activity that will be repeated throughout the classroom experience.

For more decontextualized intervention, therapists can create materials that provide multiple opportunities to practice target skills. The key is to remember that any activity used for verbal students who require language intervention can be used with students who need AAC.

### **Issue #1 – No Time to Program**

One of the things heard the most often from speech-language pathologists in the schools is that they don't have enough time to program dynamic display devices. Too often they are asked – or think they need – to program page after page of curriculum content, story details, activity specific vocabulary for each AAC user on their caseload.

This is where the use of core vocabulary, activity boards, and descriptive teaching come in handy, as well as methods of producing temporary vocabulary in the AAC system for specific short-term use.

Core vocabulary is known and used for its efficiency in constructing messages. We've talked about the need to move away from teaching students with special needs to label everything, providing them with a vocabulary of only nouns. Studies have shown (Berkowitz, 1988; Adamson et al, 2003) that instruction should limit the number of nouns. This is not to say that we don't need nouns in the AAC systems; only that we should spend considerably less time and effort teaching labels and more time teaching how to generate genuine communication messages. There are NO NOUNS in core vocabulary, and all of even the most basic two-word core vocabulary constructions are strong statements that can carry a lot of meaning in multiple contexts and situations: a minimal number of words with a maximal number of combinations, concentrating on the way a few words can be used in the most ways

When using core word systems, minimal programming is needed, as the words used by the learner with this system can be used to make a wide variety of responses and message types/formats for most situations. Fringe vocabulary can be added permanently as flip book additions to the system, or on individual boards made for specific topics used for the short-term.

With the PODD and other types of communication

books, post-its are handy for temporarily adding vocabulary to a book that may not be needed long-term.

Therapy time can include systematic introduction of specific vocabulary and syntactic structures in therapeutic format, generalization to classroom, home, and other environments, as well as looking at responding to the curriculum differently.

Choosing and introducing vocabulary becomes key. A PODD book may not be provided for every student (although that would be good). An AAC device may not be available for every AAC user (although that, too, would be good). But if, at the least, a basic core vocabulary with even one word per function is provided to all AAC learners, that student has been given more ability to communicate than 20 nouns. There should be included at least one word per major communicative function, key people/places, and the verbs, adjectives and prepositions with the broadest applications.

Speech-language pathologists need to work closely with teachers, aides, and parents: engineering the environment so that there are multiple opportunities to practice each target function, construction, and word is important, and it must be consistent across environments for the student to learn to use it. Once again – it takes 200 opportunities each day to become an effective AAC user. (Musselwhite)

The importance of stability of vocabulary for learning and that implication for intervention cannot be over-stressed. It is not always necessary to drill discrimination of the symbol – many students learn to use symbols by motor patterns without ever identifying them in isolation. If the vocabulary is always in the same location many students can get to it without even looking, via motor automaticity.

Consistent location and repetition are the keys to learning, not necessarily visual discrimination. And if you are consistently providing aided language input, using the symbols along with your verbal input, the students will learn what the symbols mean without needing isolated discrimination drills. They will learn through modeling and imitation.

### **Issue #2 – Balancing Vocabulary**

“This child’s communication book/board has too many pictures; it’s too distracting. I know he needs a lot of vocabulary, but sometimes I can’t teach it with so much there.”

This is a time to use masking: cover up some words (many devices have hidden keys options to “hide” some keys during learning phases). Then the focus can be on target words, and learners will reduce random selections or mis-hits.

A time-saving tip, also involving masking: make the

communication page or board as big as the AAC learner will be using in the long run (this doesn’t need to be forever, but should be beyond the next short-term objective). Paper masks can then be used to temporarily cover some words; by cutting parts of the mask away as needed, the need to keep re-making the board, book, or page is obviated. Likewise, on high tech devices, it is much easier to hide and reveal keys than re-program the whole page, and much easier for the AAC learner to learn where the buttons are located once, without needing to re-learn as his vocabulary grows.

## **Furthering Communication Skills**

Intervention in AAC needs to continue beyond basic core vocabulary building. As with all students who lag in language skills, such skills as syntax development, narrative structure and conversational skills need to be considered.

A variety of strategies have been explored to teach conversational skills to AAC users with severe disabilities, including several that emphasize teaching these skills in natural, genuine settings. Social interactions are important in increasing quality of life, with access to interpersonal relationships, access to curriculum, and access to community resources.

In one intervention, Hunt et al (1988) provided students with AAC conversation books including topical photographs arranged by environment and special events. Systematic instruction in turn-taking skills was then provided, along with typical peers with whom to interact. In addition to increased interaction skills, students’ use of inappropriate behaviors to attract and maintain attention decreased.

Musselwhite and Burkhart provide students with structured instruction in understanding the parts of a conversation and the types of responses used in each. Their *Can We Chat* program scaffolds conversations using sequenced social scripts for a variety of social interaction purposes. Scripts provide opportunities for social interactions where partners do not need to wait for messages to be constructed or formulated, but where AAC users themselves have the opportunity to create their own messages. Even single switch users can have opportunities to engage in genuine communication that is motivating, self-initiated, and used with a variety of partners.

Westby refers to the “Oral Literate Continuum” (1985, Simon, *Communication Skills and Classroom Success*, San Diego). Speech-language pathologists help students develop communicative competence from conversation, through narrative, and eventually to expository.

One of the things that prevents many of our students with special needs from acquiring competency in

complex levels of narrative discourse is the inability to take others' perspective or motivations. Complex narratives require ability to recognize others' *knowing, thinking, realizing, believing, remembering*.

What else hinders discourse development? Lack of appropriate scaffolding is one factor. Typical children interact with adults who provide prompts, ask questions, rephrase responses, elaborate responses, provide cues, and more. AAC users experience less scaffolding, less modeling, fewer elaborations, less direct 1:1 interaction focused on conversation. Partners often rephrase their responses with too much complexity rather than just omitting the error, and/or they don't provide helpful feedback that tells the student what to do: both saying "Good job," and saying nothing are equally useless.

The development of narrative skills is gradual and proceeds, with most children, with support from adults. Narratives develop as a part of a give and take between children and adults, with adults asking questions and providing scaffolding. Adult questions and supports are specifically geared towards the information that is needed in a narrative. Without the scaffolding from adults, and lacking robust AAC systems, students fail to develop adequate narrative skills needed for conversational interactions in social engagement and storytelling in academic engagement.

It is crucial for AAC users to develop the ability to tell about an event that happened to them. All too often their stories are restricted to a single word utterance, or responses to direct questions only. Also, they are too often asked to tell stories about events that have no emotional attachment for them, which limits both their motivation and their recall.

Storybook reading supports language development in both typical children and AAC users, teaching critical emergent literacy skill, as well as expressive language skills. Often, however, AAC users are read to less frequently and/or their interactions are less involved.

Storybooks provide a context for building expressive language skills; moreover, for AAC users they provide a context with a restricted, predictable vocabulary set. The vocabulary in any given book is predictable. For some AAC users this provides a small set of words that can be added to their AAC system temporarily. For core word users, this allows for a focus on specific action and description words. Often, teachers or SLPs will create communication boards specific to a given story to be used during reading and related activities, which eliminates navigation during the course of discussions. The use of consistent, predictable activity types during and after story book reading provides a structure for AAC users. Use of language-based tasks allows them to focus on the language, rather than on fine motor tasks and other activities that require attention and cognitive energy.

## A Word about Setting and Writing Goals

Writing functional goals for AAC users can be difficult. IEP and ISP goals often indicate that the individual will make a request for (x) 3 times per day, or will initiate an interaction using AAC 2x per day, or similar goals that predetermine what the learner is likely to want to communicate. Writing goals that are too narrow can actually lead to inappropriate intervention and decreased opportunities for learning; we cannot prescribe what an individual will say and how many times he will say it.

Goals should include increasing the number of language functions, including mediating/regulating (getting help, directing others) and discussing/describing (commenting, questioning). Being able to produce messages (even the simplest construction) for different intents is a major accomplishment, and much more functional for communicating than being able to label 10 – or 100 – things.

Data can be collected on language used within natural contexts. Objectives can track the level of initiating rather than responding or the length and complexity of utterances. Conversational interactions can be tracked for frequency; so can pragmatic functions. Objectives can be set for initiating interactions with different partners or for taking increased turns. For more severely disabled learners, objectives can be set for increasing the individual's attention to a speaker using aided language stimulation, for responding to a partner's message, for attending to the communication symbols.

Increasingly, goals for students using and learning AAC in school will need to be tied to the Common Core State Standards, a set of English, Language Arts, and Math standards developed by the Council of Chief State School Officers (CCSSO) and the National Governors Association Center for Best Practices (NGA Center) to make curriculum expectations more uniform across the United States. At the core of the Core is the expectation that all students – including those with disabilities and special needs – will be educated with a scope and sequence of content and skills. The CCSS present the scope of skills and content in Speaking and Listening, Reading, Writing, and Language. These standards build sequentially with each grade level, with a spectrum of expectations in a given area or skill from Kindergarten through High School.

For every AAC user, the team of educators and specialists who provide teaching and intervention will need to compare the student's skills and needs to the CCSS to identify goal areas and grade level content standards appropriate to that student, to determine the "essence" of the standards as they relate to language development and competency (Light 1989), to generate IEP goals, and to teach those skills needed within the context of curricular activities that are meaningful to the student and relevant to his abilities and needs. (Hennebery et al, 2000)

## The Take-Away

Effective intervention = providing structured opportunities to communicate.

- Students with complex communication needs must receive numerous highly structured opportunities; incidental opportunities are not effective for acquisition of new forms.
- Structured opportunities for communication should include at least:
  - discriminative stimulus: what you do or say to elicit a response
  - response: what you want the student to do (may be prompted initially)
  - consequence: what you do to reinforce the response
- These discreet trials are effective, and do **not** need to be provided in isolation (**should** not be provided in isolation), but should be integrated into the context of daily routines by everyone working with the students. Therapists and teachers should work with families and everyone interacting with the student to increase generalization of communication targets.

## Aided Language Step by Step

(developed by Maureen Nevers, M.S. CCC-SLP Vermont I-Team; used with permission)

### Summary:

Partner shows student how and when to use target vocabulary in natural contexts for the purpose of:

1. Increasing student's exposure to a range of vocabulary words, across different communicative functions, in naturalistic contexts.
2. Increasing student's comprehension of linguistic concepts by using a clear structure and establishing clear associations.
3. Providing a format for team members to learn concepts of modeling and to become familiar with the communication display.

### Steps:

#### Identifying Potential Targets:

1. Identify an activity in the student's day where you would like to model.
2. Identify a range of vocabulary word(s) and phrases that are connected to the activity. Look for words that represent a range of functions and parts of speech. If you are using a color-coded display, these words will be represented by a range of colors.
3. Record the activities and targets on a data collection or planning chart.

4. Repeat this process for the student's other activities. When completed, all activities (whether they are daily, weekly, monthly etc.) should be included. If possible, include specific tasks within the scheduled activities. For instance, within the literacy block there may be journal writing, reading buddies, self-selected reading etc. The more detailed the list, the more information that is available for making decisions about what vocabulary to target within each activity.

#### Selecting Activity Targets

5. For each activity, examine the list of words and phrases to determine which of the potential words you identified that you'll target for modeling.
6. For each word or phrase, think about what specific actions it may be connected to in the activity (e.g. select 'turn' to use every time the page of the book is turned). Optional: Record the specific times during the activity that the word or phrase will be modeled for the partner to reference.
7. On the planning/data chart, record information about which words/phrases the partner will model for each activity.
8. *Optional:* In addition to identifying target word(s) used during the activity, consider selecting one word to initiate the activity (e.g. "go", "do", "ready", "read") and one word to end the activity (e.g. "stop", "done", "different", "close").

#### Selecting Cross-Activity Targets

9. Identify a small set of words that will be modeled as targets across activities.
10. Record these words on the data or chart that will be kept with the communication display for the partner to reference.

#### Adult/Partner Modeling

11. Ensure that the communication display is accessible during the target activity, and that the partner knows the intended targets.
12. *Optional:* Partners may use "open modeling", where they narrate the actions and events of the activity without identification of specific targets ahead of time. This can be a useful strategy in multiple situations: when there is insufficient opportunity to plan for targets; when the partner is very skilled in modeling; or in cases where the partners are learning to model and practicing its application.
  - **For each target word, the adult will first model the use of the word, showing how the word applies to the activity. The student is not expected to point to/use the word during this learning phase**
13. *Optional:* Use highlighting,

marking or masking to help isolate the target words so that they are easy to find in the communication display.

14. Move the communication display within the student's view. If there is spoken output (e.g. iPad, SGD) and you are modeling during teacher instruction, turn the volume down. In general, the volume is down when the student is expected to be listening to the instructor or partner. The speech can be kept on during 1:1 interactions with the child or in situations when the speech would not impede the student's participation.
15. If using a starting or initiation word, point to the word, pause for 1-3 seconds for the student to look, then initiate the activity.
16. If the adult is not the partner (e.g. modeling during instructional times or when the student is engaged with another person), the adult listens and watches the activity for opportunities to use the target words. When opportunities arise, the adult models (point to) the target vocabulary that goes with the actions of the activity.
17. If the adult is both the partner and the facilitator (modeler), they may point to, say/speak, and do the action. For instance, the partner may model pointing to and saying the word "up", then turn the volume up on the student's headset.
18. Continue to model both activity-specific words as well as cross-activity targets. Pause for 1-3 seconds to allow the student to look at what is being modeled, but do not become focused on the student's visual attention. Continue to model, and the student will reference the display.

Natural Cues and Expectant Pauses

19. Select activities and events that are familiar, interesting, and highly engaging for the student.
20. Identify which word(s) you feel the student is ready to use. *Optional:* Circle, highlight or otherwise identify these words on the data or planning chart.

21. Ensure that the target words have been modeled sufficiently for the student to learn the navigational and linguistic (application) skills for use of the word(s).
  - **Adults should be sure not to use 'verbal directives', which direct the student to communicate something. Some directive phrases to look out for are: "Find the....", "Point to....", "Where is...?" or "Show me...".**
  - **The student should be provided with models of the desired responses and opportunities to use them, but never asked/told to say the message.**
22. *Optional:* Highlight or mark the target word(s) on the communication display to improve visibility and access.
23. At the moment when the partner would typically model the use of the word, the adult inserts an expectant pause, waiting and watching intently for just a couple of seconds to see what the student will do.

24. Possible outcomes: (See chart below)

Materials and Data Collection

25. Carry the planning matrix with the communication display so that all team members can recall the targets that should be modeled throughout the day.
26. As part of the team's effort data, at the scheduled interval (e.g. weekly, bi-weekly) team members should copy the matrix and use a check mark to indicate if the intended modeling actually occurred. This can be used to make decisions about when to make additions or changes to the targets.
27. A simple data chart can be used to indicate if the student was presented with opportunities for expressive use of words through the expectant pause. This information can be used to make decisions about additions or changes to the targets.

If the student....	Adult should...
reaches towards the board and hits the target	say the word and carry through with the associated action or activity
reaches towards the board and misses the target (but is in the right general location)	respond as if s/he had accurately pointed by saying the word and carrying through with the associated action/activity.
doesn't reach towards the target	try to wait for her to do something that you can interpret as initiation, but either way you model pointing to the vocabulary word and then carrying through with the associated action/activity.

## Building Connections: How does this course material impact the practice of Occupational Therapy?

The ability to communicate enhances the individual's ability to participate in occupations of all kinds. Thus, you may find yourself working closely with SLPs: interventions that allow individuals to communicate effectively are key components of interventions that allow them to participate across multiple performance areas.

This course was designed to walk learners through ways of categorizing communication levels, and how SLPs build corresponding intervention AAC strategies.

OTs can provide input, and have substantial impact on outcomes, throughout this process.

With that thought in mind, you are challenged with the following reflective questions:

- Per the course material, “Effective intervention means providing structured opportunities to communicate, providing these opportunities over and over again, providing these opportunities in multiple contexts, and providing sufficient vocabulary to make these opportunities meaningful.”

*What input can you provide as to your clients' areas of occupation, and the opportunities for communication inherent to each? Can the psychosocial aspects of your intervention plan help increase these opportunities?*

- Per the course material, “Intervention needs to constantly be monitored to ensure that it is adjusted to provide constant progress in skills. It is important to continually work with the learner in his zone of proximal development – that level of development that is the difference between what he can do independently and what he can do with support – to promote learning.”

*How can your interventions support the goal of constant progress and adjustment? (Hint: can your interventions address the skills (sensorimotor, cognitive, social, etc.) necessary to take full advantage of each client's AAC system?)*

- Are you currently collaborating with SLPs to provide services to any of your clients? Do you anticipate that your interactions and/or practices will change as a result of this course?

Space is provided for you to answer. (These answers need not be submitted - they are for your personal use.)

## REFERENCES:

- The Bioecological Model of Human Development. Bronfenbrenner, Urie; Morris, Pamela A. Lerner, Richard M. (Ed); Damon, William (Ed), (2006). Handbook of child psychology (6th ed.): Vol 1, Theoretical models of human development. , (pp. 793-828). Hoboken, NJ, US: John Wiley & Sons Inc, 1063 pp.
- Bruno, J., Trembath, D. (2006) Use of aided language stimulation to improve syntactic performance during a weeklong intervention program. Augment Altern Commun. Dec;22(4):300-13.
- Bondy, A. and Frost, L. "A Picture's Worth (A Picture's Worth: PECS and Other Visual Communication Strategies in Autism)" (Topics in Autism); Woodbine House. 2002
- Cafiero, J. Increasing Communication Skills in Students with Autism Spectrum Disorders: The AAC Technology Solutions. 1998
- Goosens, C., Crain, S., & Elder, P. (1992). Engineering the preschool environment of interactive, symbolic communication. Southeast Augmentative Communication Conference Publications. Birmingham, AL.
- Hart, B. and Risely, T. (1995) Meaningful Differences in the Everyday Experience of Young American Children. Brookes Publishing, 1995
- Henneberry, Solana, Jennifer Kelso, and Gloria Soto. "Using Standards-Based Instruction to Teach Language to Children Who Use AAC." ASHA, Perspectives.Web.
- Kent-Walsh, Jennifer, Cathy Binger, and Zishan Hasham. "Effects of Parent Instruction on the Symbolic Communication of Children Using Augmentative and Alternative Communication During Storybook Reading." American Journal of Speech-Language Pathology 19 (2010): 97-107.
- Light, J. (1989). Toward a definition of communicative competence for individuals using augmentative and alternative communication systems. AAC. Vol. 5, No. 2 , Pages 137-144
- Light, J.C., Beukelman, D.R., Reichle, J. (Eds.). 2003. Communicative competence for individuals who use AAC: From research to effective practice. Baltimore: Paul H. Brookes Publishing Co.
- Lonke, F., Augmentative and Alternative Communication: Models and Applications for Educators, Speech-language Pathologists Plural Publishing. 2014
- Mirenda, P. (2008) "A Backdoor Approach to Autism and AAC" Alternative and Augmentative Communication 24 (3), 220-234
- Mirenda, P., & Iacono, T. (Eds.) (2009). Autism spectrum disorders and AAC. Baltimore: Paul H. Brookes
- Musselwhite, C., & King-DeBaun, P. (1997). Emergent literacy success: Merging technology & whole language for students with disabilities. Park City, UT: Creative Communicating
- Pragmatic Organization Dynamic Display Communication Books: Designing and Implementing PODD Books. Porter and Burkhart 2009. Seminar
- Romski, M.A., Sevcik, R.A., Robinson, B.F., Mervis, C.B., Bertrand, J. (1996) Mapping the meanings of novel visual symbols by youth with moderate or severe mental retardation. Am J Ment Retard. Jan;100(4):391-402.
- Rowland, Charity; Schweigert, Philip. (1997) Research to Practice : Focus on: Hands-On Problem Solving Skills for Children with Deaf-Blindness — DEAF-BLIND PERSPECTIVES, vol.5, #1, Fall 1997, pp.1-4.
- Von Tetzchner, S. (1997) The use of graphic language intervention among young children in Norway. International Journal of Language & Communication Disorders Volume 32, Issue S3, pages 217–234, December 1997
- Zangari, C. Beyond Requesting: Thoughts on Teaching Interrogatives. PrAACtical AAC. February 16, 2013.

## ADDITIONAL REFERENCES & RESOURCES:

- American Speech-Language-Hearing Assoc (2001a). *Competencies for speech-language pathologists providing services in augmentative communication*. *Asha*, 31(3), 107-110.
- Banajee, M., DiCarlo, C., Striklin, S.B. (2003). *Core vocabulary determination for toddlers*. *Augmentative and Alternative Communication*, 19, 67-73.
- Binger, C. & Light, J. (2007). *The effect of aided aac modeling on the expression of multisymbol messages by preschoolers who use aac*. *Augmentative and Alternative Communication*, 23(1), 30-43
- Browder, D., Mims, P. (2008). *Outcomes for Literacy for Students with Significant Cognitive Disabilities*, UNC-Charlotte
- Browder, D., et al; Early Literacy Skills Builder. Attainment Co.
- Burkhart, L., Costello, J. (2008). *CVI and complex communication needs: Characteristics and aac strategies*. CSUN. Los Angeles
- Burkhart, L., Porter, G. (2006 ). *Partner assisted communication strategies for children who face multiple challenges*. ISAAC.
- Caffiero, J. (2004 ). *AAC supports for engaging students with autism spectrum disorders in group instruction*. Closing the Gap.
- Durand, V.M. (1999). *Functional Communication Using Assistive Devices*; *Journal of Applied Behavior Analysis*, 3 (3), 247-267.
- Finch, A. & Scherz, J. *Tips for Developing Literacy for Users of AAC*; *Perspectives on AAC*. 17 (2): 78 ASHA
- Flippin, M., Reszka, S., & Watson, L. (2010). *Effectiveness of PECS on Communication & Speech for Children with Autism Spectrum Disorder*; *American Journal of Speech-Language Pathology* (February)
- Goossens, Crain & Elder (1992). *Engineering the preschool environment for interactive, symbolic communication*. Southeast Augmentative Communication Conference Publications, as well as Mayer-Johnson Co.
- Justice, L. et al (2010 ). *Print Focused Read Alouds in Preschool Classrooms*; LSHSS (April)
- Kent-Walsh, J. & Binger, C. (2009) *Addressing the communication demands of the classroom for beginning communicators and early language users*. Practically Speaking: Language, Literacy, and Academic Development for Students with AAC Needs. Brookes Publishing.
- Light, J. & McNaughton, D. (2007) *Evidence-Based Literacy Intervention for Individuals Who Require AAC*. ASHA. Boston
- Musselwhite, C.R., Erickson, K., Zoilkowski, R. (2002 ). *The Beginning Literacy Framework*. Don Johnston Inc.
- Musselwhite, C.R. (2006). *R.A.P.S. Writing Tips!* Learning Magic Inc.
- Porter, G., & Caffiero, J. (2010). *PODD Communication Books: A Promising Practice for Individuals with Autism Spectrum Disorders*. *Perspectives on AAC*; ASHA.
- Roman-Lantzy, C. (2007). *Cortical Visual Impairment: An Approach to Assessment and Intervention*. American Foundation for the Blind Press.
- Sennett, S. & Bowker, A. (2010). *Autism, AAC, and Proloquo2Go*. *Perspectives on AAC*. ASHA.
- Smith, M. (2009). *Vocabulary Instruction and Aided Communication*. AAC by the Bay Conference. San Francisco
- Soto, G. & Zangari, C. (2009). *Practically Speaking: Language, Literacy, and Academic Development for Students with AAC Needs*. Brookes Publishing.

## INTERNET RESOURCES:

<http://aac.unl.edu/csl/pre.html>

Literacy, aac information

[www.aac institute.org](http://www.aac institute.org)

Core vocabulary information

[www.aac intervention.com](http://www.aac intervention.com)

Lots of information about AAC from where to start with literature-based boards to tips and tricks. Musselwhite, C.

[www.adaptivationinc.com](http://www.adaptivationinc.com)

Catalogue of devices, switches, and more

[www.aren.scps.k12.fl.us/training/Flyers/ECT%20Intro.pdf](http://www.aren.scps.k12.fl.us/training/Flyers/ECT%20Intro.pdf)

Environmental Control Teaching manual

[www.asha.org/docs](http://www.asha.org/docs)

ASHA's site contains position documents, and documents outlining their stand on the knowledge and skills, roles and responsibilities of SLPs regarding AAC

<http://autismpdc.fpg.unc.edu>

Lists all evidence based practices for autism spectrum disorder, including overview, intervention steps, and check sheets

[www.candlelightstories.com](http://www.candlelightstories.com) Some ebooks are free; full access costs about \$10

[www.creativecommunicating.com](http://www.creativecommunicating.com)

Patti King – Debaun's website offers materials for teaching literacy to AAC users

[www.enchantedlearning.com/Rhymes.html](http://www.enchantedlearning.com/Rhymes.html)

\$20 membership required for full site, but symbol-adapted nursery rhymes are free

[www.lindaburkhart.com](http://www.lindaburkhart.com)

Offers a multitude of free handouts on intervention in AAC with students with complex communication needs, cortical vision impairment, Rett syndrome, PODD communication books, and more, as well as how-to handouts for building switches and mounts

<http://www.novita.org.au/Content.aspx?p=683>

PODD information and workshops

[www.paulakluth.com/articles](http://www.paulakluth.com/articles)

Ideas for adapting books, including students in general ed classrooms

[www.pdictionary.com/](http://www.pdictionary.com/)

Internet picture dictionary provides symbols with English and Spanish words for use in adapted books or communication displays

[www.prentrom.com](http://www.prentrom.com)

Look for AAC Language Lab for step-by-step intervention targets, IEP objectives, and plans. This is also the source for the Pixon Project Kit by G. Van Tatenhove

[www.storyplace.org](http://www.storyplace.org)

Charlotte & Mecklenburg County public library has preschool stories with text, dialogue is highlighted, accompanying games

<http://trainland.tripod.com/pecs.htm>

Links to many Boardmaker overlays

[www.vantatenhove.com](http://www.vantatenhove.com)

Gail has many handouts here on using core vocabulary, descriptive teaching, teaching Unity/Minspeak, and samples of the Pixon boards

# Communication Levels & Augmentative-Alternative Communication Final Exam (3.5 CE Hours)

- \_\_\_\_\_ are those needed to learn how to operate the system and access the symbols it uses.
  - Strategic skills
  - Linguistic skills
  - Operational skills
  - Social skills
- Strategic competence can allow the AAC user to attain communicative competence \_\_\_\_\_.
  - By learning the general receptive and expressive language skills typically developed by all individuals
  - In spite of linguistic, operational, or social impairments
  - By forming the hand shapes of signs and sequencing the motor movements needed to find, reach, and activate symbol buttons
  - Through acquiring sociolinguistic and sociorelational skills
- \_\_\_\_\_ is what keeps the AAC learner attempting communication with a system that he has yet to learn, and with which he experiences some failure.
  - Confidence
  - Motivation
  - Attitude
  - Resilience
- Light (1988) proposes four main goals of communicative interactions: to express needs and wants, to develop social closeness, to \_\_\_\_\_, and to fulfill social etiquette expectations.
  - Exchange information with others
  - Overcome barriers
  - Facilitate competence
  - Increase self-confidence
- Rowland and Scheigert (1997) created a construct of \_\_\_\_\_ levels of communicative abilities that help in assessments and intervention.
  - 7
  - 6
  - 5
  - 4
- “Behavior is under the individual’s control, but not yet used to communicate intentionally.” This is: \_\_\_\_\_.
  - Unconventional communication
  - Unconventional behavior
  - Unintentional behavior
  - Intentional behavior
- Phase 3 of PECS intervention involves \_\_\_\_\_.
  - The introduction of sentence structure with the “I want...” sentence strip
  - Teaching discrimination between pictures and adding them to the communication array
  - Commenting, using the carrier phrase, “I see...”
  - Teaching communication initiation using a reinforcing item, a symbol/picture, and two people
- Moving unconventional communicative behaviors to more conventional and symbolic communication involves a \_\_\_\_\_ that is equally communicative, equally easy to do, and gains an equal response.
  - Repair strategy
  - Reinforcer
  - Replacement behavior
  - Related behavior
- Using abstract symbols including speech, signs, Braille, or printed words to communicate usually occurs \_\_\_\_\_.
  - around 24 months
  - between 12-18 months
  - between 6-12 months
  - between 12 and 24 months
- LAMP relies upon the brain’s function to \_\_\_\_\_.
  - Teach symbol meaning and language use
  - Recognize patterns and to learn faster when using them
  - Use a gesture to accept, or accept and reject, a word or message
  - Establish communicative intent
- Communicators in the \_\_\_\_\_ may be good candidates for use of tangible systems.
  - Emerging stage
  - Beginning stage
  - Intermediate stage
  - Advanced stage

12. **For individuals at the beginning or intermediate symbolic levels of communication, the PLLAN \_\_\_\_\_.**
- Promotes partner-initiated or controlled activities
  - Instructs partners to use consistent modeling and Aided Language Stimulation
  - Provides specific steps and lessons to give structure to the teaching of language to learners with advanced skills.
  - Encourages the use of restrictive teaching
13. **Students with significant communication needs must receive numerous – and highly structured – opportunities to communicate: research tells us \_\_\_\_\_.**
- 100 direct opportunities per day
  - 150 direct opportunities per day
  - 200 direct opportunities per day
  - 250 direct opportunities per day
14. **During spontaneous interactions, naturalistic strategies \_\_\_\_\_.**
- Develop routine scripts
  - Are structured, with a standard order to the target responses
  - Can be used in most interactions, but rarely in play
  - Are child-centered, and focus on following the learner's lead, rather than being partner-driven
15. **How well an individual develops competency with his AAC system is strongly influenced by the competencies of his partners, their degree of supportiveness, and any barriers they place in his way. Barriers exist: \_\_\_\_\_.**
- When school districts allow the student to take the AAC system home with him for practice there
  - When there is sufficient quality information available about AAC
  - When insurance companies put limits on the amount of intervention services they will pay for
  - When appropriate AAC intervention strategies are applied
16. **Porter breaks communication partners down into groups. The first group, an individual's key communication partners, \_\_\_\_\_.**
- Do not need the skills to provide ALgS consistently
  - Need only the skills to operate the AAC system in order to understand the user's communication attempts
  - Will be prominent in providing aided language input
  - Need a general grasp of the individual's communication responses
17. **Per Jane Korsten, "The average 18 month old child has been exposed to 4,380 hours of oral language at the rate of 8 hours/day from birth. A child who has a communication system and receives speech/language therapy two times per week for 20-30 minute sessions will reach this same amount of language exposure in \_\_\_\_\_."**
- 96 years
  - 84 years
  - 72 years
  - 60 years
18. **The key to aided language systems is the consistent use of \_\_\_\_\_ by all communication partners in all environments.**
- Gesture
  - Unconventional communication
  - Symbols for two-way communication
  - Vocalization patterns
19. **In Aided Language Stimulation, partners should \_\_\_\_\_.**
- Avoid using self-talk and operational talk with beginning communicators
  - Provide a model of a target language concept, then wait – and signal to the user that they are waiting – for a response.
  - Minimize the use of verbal referencing
  - Give users feedback on the effectiveness of their communication attempts, but avoid message expansion and recasts.
20. **In the context of creating opportunities to use ALgS, \_\_\_\_\_ involves arranging – or rearranging – the environment so that the user feels the need or desire to communicate in order get what he wants.**
- Recasting
  - Expression
  - Routine
  - Engineering
21. **\_\_\_\_\_ are the stimulus that the partner or environment provides prior to the communication response.**
- Cues
  - Prompts
  - Hints
  - Wait times
22. **\_\_\_\_\_ prompts provide a demonstration of what the individual should do.**
- Physical
  - Modeling
  - Gestural
  - Picture

23. **Teaching vocabulary to any individual in any context requires using a variety of multimodal strategies. \_\_\_\_\_ involves interacting with the new word in a variety of ways, including defining, illustrating, using in context, explaining through words or pictures, creating art or music that defines or describes the word, and discussing the word with others.**
- Just Give Him the Whale (Paula Kluth)
  - Rowland's Communication Matrix
  - Evidence based vocabulary instruction (Marzano)
  - Four guidelines for ALgS (Goossens)
24. **Providing activities that are motivating is the key to learning: if activities are not meaningful and motivating, the individual is not engaged. One way to make sure that the activities for learning are motivating is to \_\_\_\_\_.**
- Use the individual's key interests
  - Follow the age-appropriate curriculum
  - Supply high-tech AAC systems
  - Follow them with tests
25. **Eventually adding decontextualized activities serves a couple of purposes, including \_\_\_\_\_.**
- Accustoming the user to the pressure of finding a word while a communication partner is waiting
  - Increasing reliance on motivating themes
  - Building the speed and ease with which the AAC user can locate vocabulary in the AAC system
  - All of the above
26. **\_\_\_\_\_ are those that improve a specific communication skill removed from its usual, natural context, or in contexts that are engineered to provide an opportunity to practice the skill with support/scaffolding, feedback, modeling.**
- Motivating activities
  - Functional activities
  - Contextualized activities
  - Therapeutic activities
27. **ECT integrates three intervention tools/ strategies, including the use of structural analysis, which is: \_\_\_\_\_**
- The initiation of age appropriate communication within activities by the student
  - Knowledge of the various social contexts for communication interactions, how these contexts are regulated, and how communication functions are used within them.
  - The integration of AAC strategies and systems into the planning and implementing of AAC intervention
  - Based on requesting and rejecting
28. **Toca Tea Party, Toca Kitchen, Bamba Burger, and My Play Home are examples of \_\_\_\_\_.**
- Apps designed for children's entertainment that can be utilized to generate language interactions and increase target skills
  - Apps designed to generate language interactions and increase target skills
  - Apps designed for children's entertainment that should not be utilized to generate language interactions and increase target skills
  - None of the above
29. **A variety of strategies have been explored to teach conversational skills to AAC users with severe disabilities, including \_\_\_\_\_.**
- The "Visually Literate Continuum" referred to by Hunt et al
  - Musselwhite and Burkhart's *Can We Chat* program
  - Providing students with AAC conversation books and peer interaction independent of instruction (Westby)
  - Motivating single switch users to engage in genuine communication by removing scaffolding (Light)
30. **Without scaffolding from adults, and lacking robust AAC systems, students fail to develop adequate \_\_\_\_\_ needed for conversational interactions in social engagement and storytelling in academic engagement.**
- Motor skills
  - Discrimination skills
  - Narrative skills
  - Cognitive skills

## ANSWER SHEET

First Name: \_\_\_\_\_ Last Name: \_\_\_\_\_ Date: \_\_\_\_\_

Address: \_\_\_\_\_ City: \_\_\_\_\_

State: \_\_\_\_\_ ZIP: \_\_\_\_\_ Country: \_\_\_\_\_

Phone: \_\_\_\_\_ Email: \_\_\_\_\_

ASHA membership # \_\_\_\_\_

License/certification # and issuing state/organization \_\_\_\_\_

Clinical Fellow: Supervisor name and license/certification # \_\_\_\_\_

Graduate Student: University name and expected graduation date \_\_\_\_\_

\*\* See instructions on the cover page to submit your exams and pay for your course.

**By submitting this final exam for grading, I hereby certify that I have spent the required time to study this course material and that I have personally completed each module/session of instruction.**

### Communication Levels & Augmentative-Alternative Communication Final Exam

- |                    |                     |                     |                     |                     |
|--------------------|---------------------|---------------------|---------------------|---------------------|
| 1. (A) (B) (C) (D) | 7. (A) (B) (C) (D)  | 13. (A) (B) (C) (D) | 19. (A) (B) (C) (D) | 25. (A) (B) (C) (D) |
| 2. (A) (B) (C) (D) | 8. (A) (B) (C) (D)  | 14. (A) (B) (C) (D) | 20. (A) (B) (C) (D) | 26. (A) (B) (C) (D) |
| 3. (A) (B) (C) (D) | 9. (A) (B) (C) (D)  | 15. (A) (B) (C) (D) | 21. (A) (B) (C) (D) | 27. (A) (B) (C) (D) |
| 4. (A) (B) (C) (D) | 10. (A) (B) (C) (D) | 16. (A) (B) (C) (D) | 22. (A) (B) (C) (D) | 28. (A) (B) (C) (D) |
| 5. (A) (B) (C) (D) | 11. (A) (B) (C) (D) | 17. (A) (B) (C) (D) | 23. (A) (B) (C) (D) | 29. (A) (B) (C) (D) |
| 6. (A) (B) (C) (D) | 12. (A) (B) (C) (D) | 18. (A) (B) (C) (D) | 24. (A) (B) (C) (D) | 30. (A) (B) (C) (D) |

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# Communication Levels & Augmentative-Alternative Communication

## (3.5 CE HOURS) COURSE EVALUATION

Learner Name: \_\_\_\_\_ Completion Date: \_\_\_\_\_

PT  PTA  OT  OTA  SLP  SLPA Other: \_\_\_\_\_

	Disagree			Agree		
	1	2	3	4	5	
Orientation was thorough and clear	1	2	3	4	5	
Instructional personnel disclosures were readily available and clearly stated	1	2	3	4	5	
Learning objectives were clearly stated	1	2	3	4	5	
Completion requirements were clearly stated	1	2	3	4	5	
Content was well-organized	1	2	3	4	5	
Content was informative	1	2	3	4	5	
Content's cross-disciplinary relevance was evident	1	2	3	4	5	
Content reflected stated learning objectives	1	2	3	4	5	
Exam assessed stated learning objectives	1	2	3	4	5	
Exam was graded promptly	1	2	3	4	5	
Satisfied with learning experience	1	2	3	4	5	
Satisfied with customer service (if applicable)	1	2	3	4	5	n/a

What suggestions do you have to improve this program, if any?

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What educational needs do you currently have?

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What other courses or topics are of interest to you?

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