

AAC supports for engaging students with autism spectrum disorders (ASD) in group instruction

By **Joanne M. Cafiero**

Children with ASD are often described as the most difficult of all children with disabilities to teach. Practitioners in classrooms and clinics are challenged with finding or developing tools and strategies that engage these children for learning. The numbers of children with this baffling disability are increasing at startling numbers and, in some states in the U.S., the incidence has increased by as much as 400 percent!

Finding skilled ASD practitioners

In the past several years, as our classrooms and clinics have become flooded with these challenging children, school systems across the United States and indeed, throughout the world have been faced with finding enough competent, trained and caring professionals to serve these children and their families. Dedicated practitioners will often give countless hours of time (often after work hours) to develop effective tools and strategies for their students with ASD. The stresses experienced by these practitioners are related not only to workload, but also to providing services to families who are often in a state of crisis. Practitioner burnout is not uncommon and exacerbates the

already existing shortage of special education practitioners skilled in the ASD field. In addition to these factors, many methodologies recommend one-on-one instruction (thereby requiring even more practitioners) as the best and only way to teach students with Autism Spectrum Disorders. This article will address these critical issues by considering AAC-based group instruction as an effective model for engaging children with ASD and effecting valid and measurable gains for them.

Engagement and students with ASD

The National Academy of Sciences report, *Educating Children with Autism*, states that interventions that promote engagement effect best outcomes. Although, at this time, there is no cure for autism, targeting the unique learning styles of individuals with autism can and does meaningfully engage them, teaching them skills that have a positive effect on life outcomes.

Engagement is described as attention to task resulting in greater levels of independence. Engaged individuals persist at their tasks, even in the face of difficulty.

How can a practitioner meaningfully engage a child or adolescent with ASD? The core deficits in autism, difficulty processing multi-

ple or complex cues, difficulties with social interactions and communication, desire for sameness, result in a severe impairment that resists typical interventions that promote engagement. When an individual with autism is NOT engaged, what are they doing? Some will wander around, seemingly without purpose; other children will engage in a repetitive activity that provides them with comfort and predictability. Some children with autism are constantly in motion. While these behaviors may be a form of autistic engagement, they do not provide the scaffolding for the acquisition of skills needed for life.

Neurological research and engagement

Current neurological research has identified the structural components of early learning. Youngsters require multiple meaningful experiences to create the connections between neurons, or brain cells. Multiple, meaningful experiences provide the scaffolding for more complex learning. The difficulties children with ASD have with complex learning causes them to resist complexity and be attracted to simple, repetitive and routine experiences. A child with ASD left to his or her own devices will seek out only the familiar, routine or repetitive experience. They will

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ASD	AAC
Visual processors	Uses visual media
Difficulty with motor planning	Requires easier motor response than speech
Interest in inanimate objects	Uses tools that are inanimate
Difficulty with social interactions	Uses tools that are a buffer and a bridge between communication partners
Difficulty with multiple cues	Can use increasingly more complex cues on tools or devices
Difficult with change	Is static and predictable

Figure 1

create neuronal connections only around those familiar activities, leaving a vast bank of under-used brain connections. Tragically, around the age of 12, the body absorbs these under-used connections. The task of the autism practitioner is profound: How to create engaging, increasingly more complex experiences for their students with autism!

AAC: Tools for promoting engagement

The learning characteristics of individuals with ASD and the features of AAC have a compelling correspondence. Individuals with ASD are visual learners who have difficulty with multiple cues and social interactions which involve multiple cues. Individuals with autism have difficulties with motor planning. AAC interventions for individuals with autism are visual and require a less complex motor response than speech. AAC tools are inanimate and individuals with autism often have an interest in the inanimate because of its static, unchanging nature. Difficulties processing multiple cues can be easily addressed with AAC since the visuals used can be made increasingly more complex according to the learning level of the communicator. Individuals with autism have difficulty with social interactions and AAC tools can be both a buffer and a bridge between the communication partners. In general, then, AAC is an inanimate, visual, static media that can provide the communication and participation opportunities so desperately needed for those with autism. The table above illustrates the correspondence between the learning characteristics in ASD and the features of AAC (Figure 1).

Understanding the learning characteristics of individuals with ASD enables the AAC practitioner to create engaging, meaningful communication and participation interventions for them. These engaging interventions

can have a profoundly far-reaching effect on future learning and life outcomes!

One-on-one instruction

In the past decade, many Applied Behavior Analysis and discrete trial methodologies have recommended one-on-one instruction for individuals with ASD. Some practitioners and researchers believe that this is the only way that children with autism can be engaged and learn. Although school systems are often reluctant to provide one-on-one supports because of cost, they often do so, believing it is in the best interest of the student. The increase in one-on-one supports for individuals with autism has not always resulted in the best outcomes. Many of these children have become overly dependent on their one-on-one aide, exhibiting high levels of verbal prompt and social dependence on them. Some of these children interact ONLY with their one-on-one assistant, rather than with their peers or the teacher. Often one-on-one aides are dedicated practitioners who receive little training and even less compensation. For many school systems, this model of support for students with autism has created as many problems as it has solved.

Group instruction with AAC

This article will consider group instruction with AAC as a viable, effective, and exciting way to promote engagement and learning in students with ASD. Group instruction provides a vehicle for the generalization of skills learned in one-on-one and smaller learning groups. Group instruction is also the model used in typical classrooms throughout the United States so students with autism can more easily transition to less restricted settings. Group instruction is a more natural educational setting where students must take turns and learn incidentally from their peers. Group instruction provides the venue for social learning and the skills

that naturally flow from those experiences. AAC supports in group instruction can provide the structures for complex social learning to occur.

Engineering group instruction using AAC

First, in designing group instruction principles of two research based best practices, the Natural Language Paradigm (Koegel and Koegel, 1987) and Natural Aided Language (Cafiero, 1998) are followed. These practices are easily integrated into AAC interventions. The list below outlines the features of group instruction, as outlined in the Natural Language Paradigm and Natural Aided Language that promote engagement for students with autism.

Features of group instruction that promote engagement in students with ASD

1. Reinforcing to the students
2. Age and developmentally appropriate
3. Concrete, real objects or activities
4. Visual representations of objects and actions
5. Multiple opportunities for students to have “hands-on”
6. Combination of familiar and novel activities and vocabulary
7. Highly structured with a clear beginning, middle and ending
8. Occur with relative frequency to create a sense of predictability and familiarity
9. Natural reinforcer as a terminating event

Some examples of good activities for AAC-based group instruction include: cooking a reinforcing food, activating a toy that does something dramatic, preparing for a trip to a reinforcing place.

Of course, AAC provides the communication systems that give every student the opportunity to be an active participant rather than just an observer. The following case study will illustrate the tools and strategies needed for AAC to promote engagement in group instruction for students with autism.

Denise and her preschool class for children with autism

Denise is a veteran special educator and first year teacher of students with ASD. She generally approaches each new school year with unbridled enthusiasm and creativity. She begins her school year with six children in her class, all between the ages of three and five. She has two instructional assistants.

This is the first time any of her students have been at this school. They begin filtering in with their mothers and dads; each child in a different stage of distress. When the parents leave, Denise finds herself with six upset preschoolers; two are crying inconsolably, one is sitting under the sand table rocking back and forth, two others are wandering around the room, picking up toys and dropping them to the floor. One child is staring at a small piece of string in his hands. None of them seem to have any language and are not responding to her or her staff. These children have all been in home programs where they had the undivided attention of home teachers. Here, there are not enough adults in the room to deal with each child individually and simultaneously.

Denise quickly works to establish a routine by creating a visual schedule and visual closure system where the children can see and access it. Over the next several weeks, Denise begins to adapt her traditional pre-school activities and add AAC to them. There is no way she can provide individual instruction to each child throughout the day. She believes in the value of group instruction, both as a way to learn with and from peers but also as a way to maximize her staffing resources. She decides that each day there will be two 45 minute periods of group instruction that include each student in her class.

Denise selects an activity that all her preschool children have enjoyed: making slice and bake cookies and decorating them. She schedules the cookie making activity, a weekly event, making small changes monthly to reflect the change in season or theme. (For example, in September she makes cookies shaped like apples, using red and green sprinkles, in October, like pumpkins using orange sprinkles). Denise and her team identify the vocabulary. Using the Natural Aided Language Vocabulary Inventory, the team decides that the following words are appropriate and interactive, and will provide the opportunities for her students to be active participants in the activity (Figure 2).

Denise makes certain that she includes commenting vocabulary, since using and modeling these words will give her children an opportunity to experience comments and perhaps provide the stimulus to use them. The team leaves blank spaces on the Making Cookies language board so that as the season and theme change, additional vocabulary can be substituted or added.

Key words	Key words	Driving words	Interactive words	Descriptive words
dough	oven	open	want	good
cookie	knife	slice	I need help	yucky
spatula		cut	open	hot
cookie sheet		put on	more	uh-oh
napkin		sprinkles		
Who's turn?		eat		Ending words
bathroom		wipe hands		All done.

Figure 2 - The Natural Aided Language Vocabulary Inventory

1. Materials are prepared and ready for use.
2. Primary facilitator is the auditory and visual focus of the activity.
3. Secondary facilitators provide support and reinforce the language input of the primary facilitator. This promotes engagement by decreasing the boredom associated with repeating the same message to each student in succession.
4. Children with behavioral difficulties are not seated together.
5. Children with high engagement are seated next to children with low engagement so that low engagement students receive the benefit of the interaction between the primary facilitator and the high engagement student.
6. Secondary facilitators are situated so that they have the responsibility for a mixture of engaged and non-engaged students.
7. The primary facilitator uses large moveable symbols to provide direct language stimulation to those students who have difficulty with engagement, maintaining attention, and shifting attention.

Figure 3 – AAC in Group Instruction (Goossens', 2000)

Denise makes a communication board for each of her students as well as corresponding large 4- by 4-inch separate symbols that she will use to provide receptive language input as she facilitates the activity. Denise wears a communication vest made of Velcro® sensitive material that her large symbols will adhere to. She will then have her hands free for manipulating the target items. She places PCS® overlay with the target vocabulary on a 32-cell speech generating device and asks a 2nd grader to record the vocabulary she and her staff have selected.

Denise uses the Goossens' (2000) model for group instruction with AAC (Figure 3). She groups the students carefully; making certain that students who are more active and may tend to be disruptive are separated from each other. She also situates her most responsive student next to her least responsive student. In this way the quiet, less responsive student will be receiving input and attention by virtue of where she is seated. Denise teaches her staff the Goossens' Primary-Secondary Facilitator

Model for group instruction with AAC. In this model, the visual and auditory focus is on the primary facilitator, seated in front of the children. The secondary facilitators, initially are Denise's teacher assistants. As the activity becomes more familiar, however, Denise rotates her staff through the primary facilitator role. The role of the secondary facilitators is to reinforce the language input given by Denise as well as to manage behaviors, if needed, and to unobtrusively prompt functional communication. Goossens' advocates this method of reinforcing language as it is unobtrusive and quiet: the secondary facilitators point to symbols that reinforce the activity and the pointing occurs from the back of the children. Goossens' further recommends that each secondary facilitator use a rolling stool. This enables them to easily move behind students to provide language reinforcement, modeling of correct language, and expansion of the child's vocabulary as needed. Prompting from the back of the student is more effective since it

is less likely that the student will identify the prompt as an intrinsic part of the activity.

Denise begins the activity by removing the symbol for cookie from the felt board behind her and saying, “Today we are going to make cookies!” she takes the cookie symbol and scans it in front of the eyes of each of her students. Her less engaged students can not avoid looking at the symbol as it moves within a few inches of their faces. The more engaged students are able to shift visual attention between Denise’s symbol for cookie and the corresponding symbol on their communication boards. They do this by looking at Denise’s symbol and looking down at their communication board where an assistant is pointing to the same symbol. Another student says “making cookies” by activating the speech-generating device after a point prompt from a secondary facilitator.

Denise, as primary facilitator, conducts the baking cookies activity by pairing her spoken language with pointing to the large PCS®.

Denise’s objective for her students as a group is engagement or on task behavior during the activity, (since increasing engagement happens to be a common IEP objective for each of her children). Denise identifies several other IEP objectives that can also be addressed within this activity: increasing functional spontaneous communication, increasing the number of symbols used to communicate, and decreasing stereotypic and aberrant behaviors.

To accurately measure the time a student is engaged, Denise and her staff define engagement in clear, easy to observe terms, as follows:

- The student is making eye contact with the symbols, the primary facilitator or any of the target items.
- The student is vocalizing, speaking, touching or pointing to a relevant symbol or activating the speech-generating device in response to the primary facilitator or the ongoing activity.
- The student is not engaged in any of their individually identified stereotypic or aberrant behaviors as identified on their behavior intervention plans.

The pre-school team decides that if a student is fulfills any one (1) of these identified behaviors, he is considered engaged during that time period. The engagement behaviors are described as observable and measurable. Although an unruly, unengaged group of

pre-school children is rather obvious, as is an engaged group, it is important to be able to quantify the students’ responses. This enables practitioners to measure over the course of instruction, the precise amount of time a student is engaged. It is also an indicator of the effectiveness of the intervention, telling practitioners whether changes are needed in the protocols: Is the activity reinforcing enough? Are the staff providing enough aided language input? Are changes in the vocabulary needed?

Denise and her staff use the following modified Incidental Teaching (McGee, 1999) strategies with Natural Aided Language (Cafiero, 1998) scripts.

Environmental prompt

The environmental prompt requires the presence of the target item, (for example the items needed for making the slice and bake cookies), and an activity based communication board for each child. This natural prompt is really like no prompt at all and is the stimulus for functional spontaneous communication.

Environmental language prompt

The primary facilitator uses aided language to comment about the activity, without directly addressing the children. For example, Denise says, showing the large symbol for cookie and pointing to the cookie dough, “Mmm, I love these cookies, I can’t wait to make them!” Environmental language prompts include tempting the communication partner(s) by manipulating the target item and commenting on it, without making any direct bids to the students.

Anticipatory prompt

This prompt is a wait prompt in which the primary facilitator uses only body language and facial expression to indicate the expectation that the communication partners will communicate spontaneously. It can include shrugging, shifting eye contact between the target item and the communication partner(s), or raising one’s eyebrows. This prompt does not specifically include verbalizations. This is a very subtle prompt that only the most observant and connected students with ASD will respond to. Nonetheless, it is an unobtrusive prompt that can stimulate more spontaneous communication in the non-speaking communication partners.

Point and modeled prompt

A point and modeled prompt is a direct point to a particular symbol by the speaking communication partners for the purpose of directing the student’s attention to that symbol as a communicative response. For example, if the primary facilitator asks “What do we need to do next?” either the primary or secondary facilitator points to the symbol(s) that answer the question, for example “Cut the cookie dough.”

Repair and expansion responses

Repair and expansion responses are aided language strategies that take the communication of the student as a stimulus for either clarifying, repairing or expanding the initial communication. For example, if the student’s response to the question “What’s next?” is a vague point to the general vicinity of the symbol “cut”, the facilitator repairs and shapes that attempt by saying “cut the dough” pointing directly to the symbol for “cut.” If the student is pointing to “cut,” the communication partner can expand that to “Cut the cookie dough”. The response of the facilitators becomes the stimulus for teaching new vocabulary. The practitioners also use wait time in between each prompt to allow the children time to process the language. It is important for practitioners to accurately gauge the length of the wait time; long enough to allow for language processing, but not so long that the child becomes disengaged from the activity. The precise wait time is often different for each child and calculating that is within the realm of the “art” of AAC interventions.

Measuring engagement

Engagement is a primary goal for each of the students in this ASD preschool. Measuring engagement can be done easily with the existing supports of this typical ASD classroom.

Denise and her staff create a data collection tool that is easy for them to use. They decide to include their definition of engagement on the tool to provide a clear reminder of exactly what engaged behavior looks like. They also decide that they will take data probes of engagement one day per week during the group instruction activity time. Each week, data will be collected on three of the six students so that by the end of one month they will have two full sets of engagement data for each student. The first data collection point occurs during group instruction before any intervention is imple-

mented. This indicates the child's present levels of performance and is also baseline. Denise collects this data early in the school year on each of her preschoolers.

Denise decides that she will take a sample of time engaged during group instruction. It simply is not reasonable to collect this engagement data during the entire group activity period, (which can last up to 45 minutes); and she needs her assistants as secondary facilitators. Using a count-up timer, Denise measures time engaged according to the criteria defined by her team. When her first student, Mia, is engaged, the timer starts; when Mia is not engaged (again, as defined by the engagement criteria), the timer is stopped. At the end of the five minute time sample, there will be the total time Mia is engaged expressed in minutes and seconds. The time in seconds can be graphed or a percent engaged calculated for the five minute time sample. Denise calculates the percent time engaged by dividing the total number of time engaged by the total time period, five minutes (or 300 seconds). The data collection tool (Figure 4) shows how the engagement data can be collected and prepared for analysis. Notice that she includes a place to indicate who was measuring (coding) the time engaged. This is important information and often will shed light on any data that seems inordinately high or low. The Primary Facilitator is also indicated on the data collection sheet. There is also a place for comments. Notice that on 9/29, Mia went home sick. This may explain her low levels of engagement that day (Figure 4).

The graph tells the story of little Mia's pattern of engagement (Figure 5). Baseline engagement was at 10 percent. Within the next two weeks her engaged climbs to 15 percent, then drops to 6 percent two weeks later. In looking over the data, Denise and her team determine that it was not anything related to the intervention that created the drop; Mia was simply out-of-sorts that day. The trajectory of the graph shows clearly that Mia is exhibiting increasing levels of engagement. Denise shares this graph with Mia's parents at the November Parent Conferences; they are delighted and want to learn how to implement a similar intervention at home.

The ease with which group instruction is occurring is validated quantitatively by their data collection and analysis. Team members share the roles as primary facilitator, secondary facilitator and coder. Denise finds that

Student: Mia		Date(s): 9/1/04-11/14/04			
<u>Environment:</u> Group Instruction with peers					
<u>Materials:</u> Target items, communication board, VOCA, count-up timer					
<u>Objective:</u> Given identified reinforcing activity, target items and communication board, Mia will increase time engaged, defined as follows:					
<u>Time:</u> Five minute time sample during activity					
<ul style="list-style-type: none"> • The student is making eye contact with the symbols, the primary facilitator or any of the target items. • The student is vocalizing, speaking, touching or pointing to a relevant symbol or activating the speech-generating device in response to the primary facilitator or the ongoing activity. • The student is not engaged in any of their individually identified stereotypic or aberrant behaviors as described on their behavior intervention plans. 					
Date	Time/sec.	%	Comments	Facilitator	Coder
9/1	30/300	10%		Denise	John
9/15	45/300	15%		Denise	Pat
9/29	20/300	6%	sick	John	Denise
10/7	120/300	40%		Denise	John
10/21	260/300	86%		Pat	John
11/4	240/300	80%		Denise	Pat

Figure 4

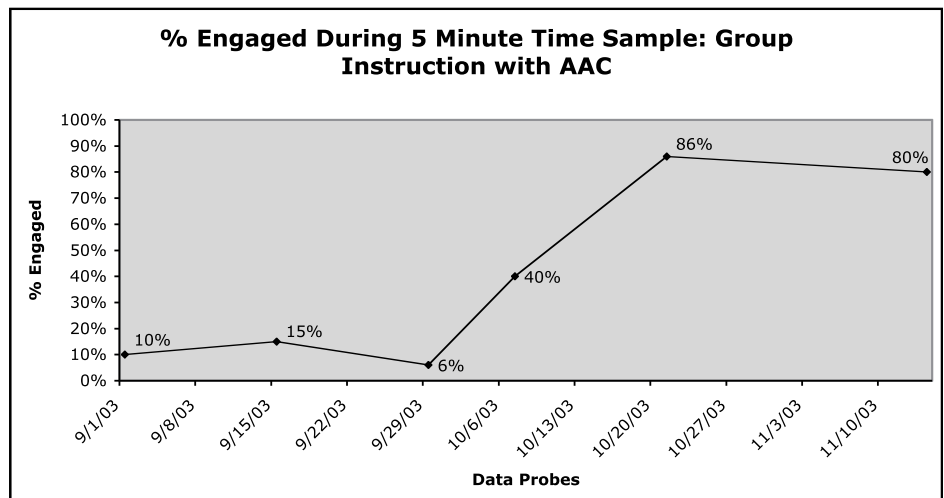


Figure 5

she has engineered a group activity that utilizes her existing resources optimally while providing the stimuli for her preschoolers to communicate, participate and demonstrate high levels of engagement.

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