

Technology's Impact on AAC in Classrooms

- Differences emphasized over similarities in student needs
- Time constraints
 - Priorities on “quick & easy”
 - Therapy time spent programming instead of supporting language
- Poor language and academic performance
 - Limited generalization and de-contextualization of language
 - Limited participation in the learning process
- Technology intimidation that results in reduced interaction between student and teacher
 - Lack of coaching & modeling by teachers

Teacher Training

- Teachers are taught how to....
 - Teach in consideration of state curriculum and testing standards
 - Implement curriculum materials using various teaching strategies
 - Focus on critical concepts & vocabulary as identified in the curriculum materials

Teacher Training (cont.)

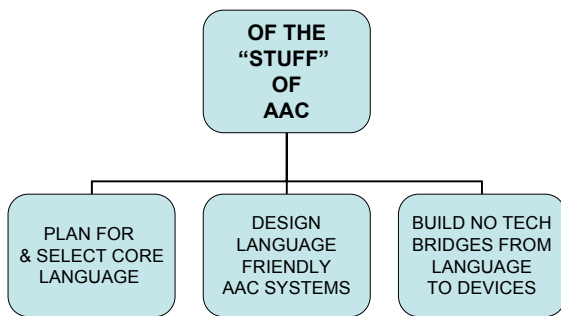
- Taught to get fluid, up-to-date information about what their students are learning (review) or have learned (test)
 - Use self-made or curriculum-based review and test materials
 - One word, response-oriented questions are asked - content words are the answers to these questions
 - Academic = Where is the Iditarod held?
 - Critical thinking questions are asked to probe deeper into the student's learning – require more than a one word response
 - Academic = Why would a musher want to use an experienced lead dog?

Teacher Style and AAC Users

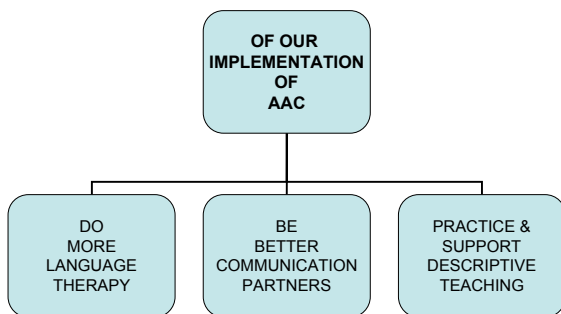
- **Referential Style**
 - Requires access to an ever expanding body of content vocabulary for quick, word responses
 - Requires the least amount of critical thinking or language production by the student
 - Puts the highest memory demand on AAC users with the least pay-off in learning or language development
- **Descriptive or Critical Thinking Style**
 - Requires access to a body of high frequency, reusable core vocabulary for longer, descriptive answers
 - Requires more integration of the information (Bloom's Taxonomy of Learning)
 - Allows the student using AAC to focus on the information in the lesson and not on learning new pages and symbols

Baker, 2005

PART 1: MATERIAL FACTORS



PART 2: HUMAN FACTORS



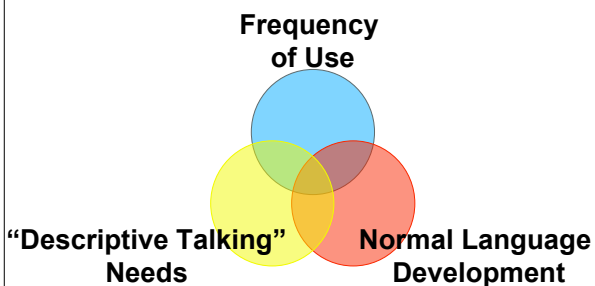
Material Make-Over Challenge #1

PLAN to give the student
access to 50 - 400
permanently available,
APPROPRIATE, HIGH
FREQUENCY, RE-USABLE
words and word variations

Permanent, Re-usable Vocabulary

- Words to which the student ALWAYS has access
- Words which the student can use across activities
- Words which the student needs to learn to use so he/she can talk when he is not in school anymore

Words Selected Based on ...



+/- of High Frequency Words

- Generic and understandable based on the context of the situation
 - “Let me do it” vs. “Let me stir the brownie mix”
 - “Get the stuff” vs. “Get the brownie mix, eggs, oil”
- “Binder” words that hold together the substantive words
 - “some of that”
 - “do for me”
 - “go with you”

Which is Higher in Frequency?

- | | |
|----------|----------|
| • List 1 | • List 2 |
| – of | – top |
| – with | – bottom |
| – by | – over |
| – for | – under |
| – than | – around |

Which is more likely to be a better investment in “real estate” on the AAC system?

+/- of Normal Language Devlpt Words

- Words that are used to express a full range of pragmatic functions (reasons to talk)
- The “early” words that children use
 - “my” vs. “mine”
 - “up” vs. “over”
- Word endings (morphological markers)
 - “+ing”
 - +s (plural)

Some Reasons to Talk

- Greet/Part
 - Hello, bye bye
- Request object
 - That, please, cup
- Request action
 - Want, get, do, up
- Request assistance
 - Help, do
- Request recurrence
 - More, again, another
- Request information
 - What, why, where
- Existence
 - This, that, look, see, there, here
- Self/Possession / Person
 - Mine, you, it
- Nonexistence
 - Uh oh, away, all gone, what
- Disappearance
 - Away, all gone
- Rejection
 - No, stop, don't, uh uh
- Cessation
 - Stop, all done, finished
- Comment/Describe
 - Like, bad, good, naughty, big, little, yuk, yum, hurt
- Direct action/events
 - Go, help, stop, come, eat, read
- Name
 - Car, shoe, cup
- Associative
 - Big, hot, pretty, up, off

+/- of “Descriptive Talking” Words

- Words that are placed on AAC systems in order to communicate words that are NOT on your AAC system
 - “stir” = “go around”
 - “beat” = “fast around”
 - “mixer” = “loud thing turn around”
- Usually means we put more adjectives, adverbs, prepositions, generic nouns (trouble, idea, job) and verbs on AAC systems

The Process

- List out the PRAGMATIC categories for which you want to have words (NLD approach)
 - Pick the most Frequently Used words for those categories (the first 50) that allow you to MEDIATE/CONTROL any activity
- Add more words in the “big categories” that you need to talk descriptively (the next 50 – 100 words)
 - Allow you to DESCRIBE & COMMENT with more variety
- Add stuff to expand language based on normal development (about 5 to 20 words)
 - early morphological markers (verb tense, plural, comparative superlatives)
 - “binders” = prepositions, conjunctions, articles
 - Special Symbols (same as, opposite of, part of, sounds like, etc.)

Expanding the Vocabulary

- To your “high frequency, re-useable words” that are permanently available, add....
 - Personal core (key people, places, things)
 - Predictable, generic school needs
 - Colors, numbers, shapes, days, months
 - Alphabet
- Extended vocabulary that is “semi-permanent”

The Big Question

- Hasn't someone already made a list of permanently available, high frequency re-useable words to be considered when developing an AAC system?

The Answer

- Yes. The Pixon Project has done just that, plus more!

Pixon Project

- An AAC-Based Language Development program that provides instructional modules for teaching 150 core vocabulary words
 - Pre-made manual boards with core vocabulary and early morphological markers
 - To be released in early 2009
 - Contact Gail for more information

Make-Over “Jobs”

- **Advocate for an language-based AAC curriculum in your school district**
 - Check out the Pixon Project Kit
 - Create your own
- **Give each student you support a set of core vocabulary (8 - 25 - 50 - 400 words) with morphology (as appropriate)**
- **Design a custom system to maximize “stability” of the core vocabulary**

Material Make-Over Challenge #2

Design/Select a language-friendly AAC system or device that gives the person **EASY ACCESS** to his/her words so he/she can interact independently, easily, quickly and across multiple settings

Language-Friendly Design Should...

- Promote the easiest possible Access to language
 - With my brain
 - With my body
- Promote Motor Automaticity so I can talk without thinking

AAC System Designs on Manual Communication Boards

- Single Sheet design
 - Everything you can say is on 1 “page”
- Multiple Sequential design
 - You have to turn the page to get more words and when you do you lose access to all the other words you just had
- Multiple Simultaneous design
 - You turn a “section” of your MCB to get some new words, but you don’t lose all your other words

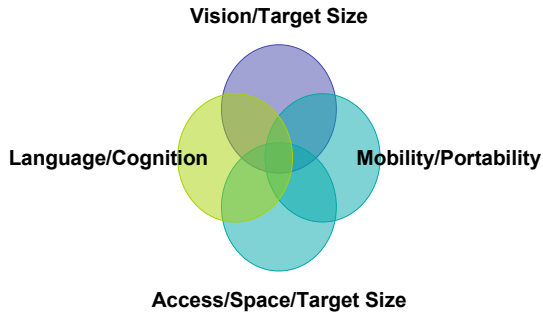
U of IOWA FINDINGS

- Single Sheet display
 - Easiest to use physically, cognitively, and linguistically
 - Produced the “best” language structure and content
 - Conversation flowed the best
 - Used spelling and word strategies when need more words

IOWA FINDINGS

- Multiple displays
 - Sequential – hardest to use, least often used – stayed on main display and used strategies to alter words
 - Cognitive/Language – memory, sequencing/navigating, dissonance
 - Physical – effort to turn the page
 - Simultaneous – better than sequential, but still awkward

Design Variables



Make-Over “Jobs”

- **Design MCBs for ALL YOUR STUDENTS**
 - Either BEFORE getting a device or WHILE using a device
 - Balance, as best as possible, the variables to have as stable of a system (SSD) as possible
- **Advocate for language over technology**
 - Be ready to explain why a robust MCB might be a better language option than a SGD (at this point in time)
- **Select technology based on how it manages language**

Material Make-Over Challenge #3

Use low-tech strategies in the classroom & therapy to BUILD BRIDGES between language & technology, especially when the person has severe physical, behavioral or sensory disabilities

Why Bridge Access Problems?

- Time issues
 - Communicating word-by-word takes time
 - Access errors slows down the process and often creates confusion and frustration
- Priority on LANGUAGE learning and output, not access
 - Use MCB with Partner Assisted Scanning

Why Bridge Sensory/Behavior Concerns?

- Some students are visually or behaviorally distracted by technology features
 - Flashing screens
 - “Play” with the device and speech output
- Helped by the human interaction required with MCB systems (e.g., PECS)

Why Bridge Language Learning?

- Some students need real “hands-on” experiences with paper to process language and symbols
 - Move symbols around
 - Physically turn a row or section or page

BRIDGES

- Paper versions of device vocabulary (Visi-Voca)
- Language building boards (e.g., Fokes Sentence Builder)
- Activity or story boards (based on blueprint of MCB or device codes)
- Descriptive environmental engineering – Materials that emphasize “what do” instead of “what is”

Make-Over “Jobs”

- Make Visi-Vocas for device users
- Develop plans for using low-tech strategies as “bridges” for learning and functionally using permanent, re-useable vocabulary
 - Language building materials
 - Activity and story boards
 - Descriptive environmental engineering

Human Make-Over Challenge #1

Decide that, as an SLP, your primary job is to **SUPPORT LANGUAGE DEVELOPMENT** and then provide well-rounded language intervention, based on NLD, in therapy and in classroom activities. Vow to be a therapist and **NOT** a programmer

Language Therapy & AAC

- Do “traditional” therapy in modified ways
 1. Pragmatics
 2. Vocabulary
 3. Syntax
 4. Morphology
 5. Discourse
- Modify materials to accommodate AAC system

1 - Pragmatic Teaching

- Establish environments/set-ups that provide communication opportunities
- Modify your behaviors to promote communication initiation
 - Create barriers
 - Feigned stupidity
- Provide logical consequences

2 - Vocabulary Teaching

- Start by teaching the word in context
 - Real-life activity
- Provide props to do hands-on application of the metaphor used to represent the word
 - Key for the early emerging words that are NOT picture producers
- Do de-contextualization activities to expand the student’s understanding of the concept

Vocabulary Teaching with AAC

- For pre or non-literate individuals, vocabulary is represented with pictures and these pictures have to be taught
 - Visual conventions
 - Metaphors – visual, experience, abstract
 - Vocabulary versatility
- For “aided” systems, these pictures have to be “organized” and the organizational strategies have to be taught
 - Semantic organization
 - Grammatical organization
 - Situational/environmental organization
 - Visual scenes

Supporting Organizational Learning

- Traditional Strategies
 - Color coding
 - Grouping
 - Visi-Voca (for devices)
 - “Charts” to learn “full group”
 - Word webs to teach “relationships” between words and codes
- Allow AAC user to “add” new vocabulary themselves
 - Maintain consistency in the “rules” of the organization

3 - Teaching Syntax and Morphology

- MODEL MODEL MODEL
- Use standard SLP materials with modifications
- Color code Parts of Speech on AAC Systems
 - Write out words & sentences in color code
- Self-evaluate language from LAM samples
- Teach a need for a variety of word groups using a “metaphor” the student understands
 - “rainbow” of words = sentence
- Use metaphors and music to teach grammatical classes
 - Humanization of language*

4 – Teaching Discourse

- Social conversation is a HUGE issue for most AAC users
 - “Learned passivity”
 - Egocentric, needs-based communication
 - Individuals “on the spectrum”
- Work on Narrative Development
 - Pre-stored/Generative
 - Fully Generative
- Implement social communication curriculum with modifications for special AAC issues

Human Make-Over Challenge #2

Learn to MODEL,
PROMPT, and RESPOND
in ways that encourages
the person using AAC to
produce improved
language

Three Critical Communication Partner Behaviors

- Model Language through Aided Language Stimulation
 - Helps the partner know WHAT the person can say with the AAC system and HOW to say it
- Prompt Awareness
 - Helps the partner be aware of the level of prompts being used
- Response Strategies
 - Helps the partner provide the kind of language the student needs to improve output

Been Around a While

- Called by different names
 - Partner-Augmented Input (PAI)
 - Natural Aided Language (NAL)
 - Aided Language Input (ALI)
 - Aided Language Stimulation (ALgS)
- Promoted by different people
 - Goossens', Crain, & Elder (1992)
 - Ronski & Sevcik (1996)
 - Cafiero (1998)

Contemporary Research

- Augmentative Communication News (Summaries)
 - Sept 2006 (Vol 18, Number 3) – 16 pages of info on ALgS
 - Go to www.augcominc.com
 - Single copy issue = \$20
- Shakila Dada (2004 – U of Pretoria, South Africa)
 - It is useful to teaching receptive vocabulary
- Cathy Binger (2004 – Penn State)
 - It is useful for teaching basic syntax (2 and 3 part utterances)
- Shelley Lund (2003 – Penn State, U of WI-Milw.)
 - It is useful for teaching morphology (after 320 models)

Principles of ALgS

- Model maximum language possible and necessary without overwhelming the student
 - 1 or 2 words beyond current language output level
 - Based on target vocabulary, language level, or target concepts in the lesson
- Model at a rate SLOW enough for student to observe vocabulary selections, word combinations, and codes or navigational sequences
- Pair with speech as needed
- Utilize in parallel with Prompt and Response strategies

Prompt Strategies

- Expectant Delay (a comprehensive strategy)
 - Watch & Wait for 10 – 15 seconds
- Open-Ended Prompts (with expectant delay)
 - Broad Prompt = “Tell me about him (the lead dog) (Watch & Wait)
 - Focused Prompt = “Why does he need to be experienced?” (Watch & Wait)
- Coached Prompts (with expectant delay)
 - “Idea” Prompt = “Tell me either where he is or what he does? (Watch & Wait)
 - “Word Option” Prompts = “Let’s look at some words you can say with your board and see if you can tell me about the lead dog using one of them. Let’s start with Action Words.”

Response Strategies

- Expand
 - The student says “know” and you model “knows where (to) go”
- Connect
 - The student says “know, “ you model “because” hoping the student will add “go before”
- Correct (order, ending, word choice)
 - The student says “where know go” and you model “know where go”

Outcomes with Device-Based ALgS

- How many models of a word, using the person’s own device, have I provided before I started seeing the person use that word later on by him/herself?
 - Van Tatenhove (2006) – Using Language Activity Monitor (LAM) data
 - Range of 50 to 100 models (2 included students)
 - Range of 100 to 125 model (3 MR/DD adults)
 - Casey (2008) – LAM data
 - Range of 100 – 120 models (1 MR/DD adult)

Outcomes with Visi-Voca Based ALgS

- How many models of a word, using the client's Visi-Voca, have I provided before I started seeing the person use that word later on by him/herself?
 - Van Tatenhove (2007) Logs and LAM Reviews
 - Client (27 year old literate male, CP with Pathfinder with U128 with U128 Visi-Voca)
 - Answer = Range of 75 to 150 models
 - Client (30 year old woman, Down Syndrome and CP with Pathfinder)
 - Answer = Range of 100 - 200 models

Human Make-Over Challenge #3

Learn to TEACH, TALK
WITH, AND TEST
students using descriptive
strategies with high
frequency, re-useable
common core words

Re-Cap of Classroom AAC Challenges

- Emphasis on the referential model used by teachers at all levels of educational placement results in ...
 - Huge programming burdens
 - Pages and activity rows which begin to take on a life of their own
 - A huge memory burden on the student
 - Little long-term language development

Descriptive Teaching Model

- An alternative approach for helping students using AAC to participate actively within regular and special education classrooms
- An approach that builds on 2 pillars for teacher success (R. Hurd)
 - Changing expectations of teachers
 - Improving teacher's ability to help
- An approach that uses the "constructivist" approach to teaching and learning, plus supports Bloom's Taxonomy of Learning

Constructivism

Learning is the result of "mental construction." Students learn (construct knowledge) by fitting NEW information together with what they already know, not by passively receiving instruction and repeating ideas.

Application to AAC

- What does the student already have available and is learning/knows?
 - Critical words already in the device
- What "new information" is being taught?
 - Vocabulary words and concepts introduced in the lesson
- Constructivist Approach = Instead of programming more and more words into the AAC device for vocabulary in the lessons, the student communicates those new ideas with high frequency, re-usable words already in his/her vocabulary system.

Bloom's Taxonomy of Learning

- People learn in 3 domains
 - Cognitive
 - Attitudes
 - Physical & Motor Skills
- Cognitive Domain Levels See DTM Planning Form
 1. Knowledge
 2. Comprehension
 3. Application
 4. Analysis
 5. Synthesis
 6. Evaluation

**Descriptive
Teaching moves
kids through the
domain levels**

Requirements to do the DTM

- Have 50 - 350 permanently available, appropriate, high frequency, re-usable words and word variations in the student's AAC system (MCB or devices)
 - core vocabulary (purely selected based on frequency of use) + semantically and/or linguistically useful words and word altering strategies = Critical Words
 - go to www.vantatenhove.com for a vocabulary list
 - see the vocabulary in The Pixon Project Kit
- Learn to use visual teaching strategies and support materials that make the process EASY

Visual Strategies and Materials

- Strategies
 - Modeled language for the person using the AAC system (Aided Language Stimulation)
 - Prompting strategies
 - Response strategies
- Materials (to match student's personal AAC system)
 - Manual communication board (duplicate of student's)
 - "At-A-Glance" displays of the critical vocabulary (for students with robust AAC devices)

Step 1: Current Teaching Routine

- Observe the classroom for at least 1 day
- Log % of referential vs. descriptive styles used in oral activities
 - with normally developing students
 - with student using AAC
- Note communication partner skills
 - timing (expectant delay, pace, etc.)
 - prompting strategies
 - response strategies
- Note roles of teacher, therapists, assistant, peers

Step 1: Current Teaching Routine
(cont.)

- Review written materials
 - types (paper, computer)
 - modification strategies used/needed
 - to access the materials
 - to be more “linguistic” in demonstrating knowledge
- Understand school policies and current practices to support inclusion
 - Participation Model (Miranda and Beukelman)
 - SETT (Zabala)

Step 2: Demonstrate the Model

- Have the teacher select a lesson on which he/she is currently working
- List the key content vocabulary of that lesson
- Determine what words are or are not already in the AAC device
 - Look at Wall Chart of critical Words (Natural Aided Language Board)
 - Look in Manual
 - Look up with Icon Tutor
- Determine how to handle the “not in” words

Coping with Teacher Freak-Out

- “These ‘definitions’ are too long for my student to say. He/she only talks with one or two words. Even if he/she could do this, it would take forever to get an answer.”
 - How much does the student need to say to show you he/she has grasped the concept?”
 - Form = way something looks because of way it is put together
 - acceptable examples: look, way look, how look and made
 - How can you balance this approach with the current ways you are reviewing and testing knowledge?

Step 3: Train on the NALB

- Don't assume the chart is self-explanatory
- Call it something that is familiar to the teacher (e.g., “Word Wall,” “At-A-Glance” Vocabulary Chart)
- Explain how the chart provides the “code” to the words in the machine
 - Minspeak icon sequence
 - Page-based navigational sequence

Step 3: Train on the NALB (cont.)

- Show how the words are organized
 - Part of Speech (with color coding)
 - Alphabetical order (except for people words)
 - Interrogatives in the “word group” that answers the question
 - Blank spaces to add more words
 - “Short term” parking at the bottom for temporary words
- Practice finding words

Step 4: Organize Lessons

- Provide a structure for helping the teacher “organize” a lesson with the new approach
 - Coordinates with current “lesson plan” strategies
 - Helps the teacher think in terms of Descriptive Teaching-Talking-Testing instead of Referential Teaching-Talking-Testing
- Show the teacher “lessons” organized by other teachers
- Offer the use of a pre-developed Lesson Planning form, if needed

Possible Challenges

- Multiple kinds of AAC devices and/or programs used in a classroom with multiple kinds of picture representations
 - Use 1 main critical vocabulary board for teacher to teach and test with the available vocabulary (no pictures) and personal boards by the students’ desks (with pictures)
- Teachers moving around the room
 - Make NALB as a free-standing or portable board
 - Make several NALBs to post around the room
- Lots of “independent” or small group working time
 - Create “stations” with NALB posted
 - Use peer helpers

Are teachers really doing this?

- Teachers and class levels
 - Regular education more frequently than special education teachers
 - Preschool and elementary more than middle or high school teachers
- Initially doing planning forms for selected activities and lessons
 - 1 to 10 plans with support of SLP
 - Begin to implement DTM without pre-planning after 3 to 4 months of consistent use
- Visual support materials
 - Using mostly NALB
 - Little time for anyone to modify more materials

Teacher Reported Subjective Outcomes of Descriptive Model

- **Teacher Outcomes**
 - Slows down speech rate & shortens sentence length
 - Emphasizes gaps in critical vocabulary when rehearse and do lesson
 - Builds natural support networks
 - Helps other students in the class with learning challenges
- **AAC Student Outcomes**
 - More active learners
 - Testing results are higher and more reliable
 - Improvements in reading/writing skills
 - Increases in multiple word production in AAC device

Objective Data of DTM

- Language Activity Monitor samples taken over the school year on 3 students with high tech devices
 - Student 1: Vantage with Unity45, 1st grade
 - Student 2: Vanguard with Unity84, 2nd grade
 - Student 3: Pathfinder with Unity128, 5th grade
- Each student tracked on 100 key vocabulary words and length of utterances used in spontaneous, self-generated communication collected from a sample of 2 weeks use of the device
 - No specific therapy done on these 100 words

Vocabulary Use & Sentence Length

- **Student 1: U45 Sequenced in VT**
 - Using 12/100 key words in August 2007
 - Using 74/100 key words in April 2008
 - MLU-M increased from 2.30 to 4.37
- **Student 2: U84 Sequenced in VG**
 - Using 33/100 key words in August 2007
 - Using 81/100 key words in April 2008
 - MLU-M increased from 3.71 to 6.29
- **Student 3: U128 Sequenced in PF**
 - Using 42/100 key words in August 2007
 - Using 99/100 key words in April 2008
 - MLU-M increased from 3.82 to 7.25

Summary of the DTM

- **Teach** the lesson with the critical vocabulary
 - Identify referential vs. critical thinking questions that are already part of the lesson plan
 - Re-define referential, content words DESCRIPTIVELY with the available critical vocabulary
 - Use Visual Support Strategies (ALgS, Prompt, Respond) using a NALB
 - Modify current curriculum materials, as needed

Summary of the DTM

- **Talk about/Review** the information with the AAC student
 - Train assistants to model simultaneously
 - Immediate review using the student’s AAC system
 - Create review materials using “symbolized” critical vocabulary
 - e.g., worksheets created with PASS or Writing with Symbols software

Summary of the DTM

- **Test** the lesson with the critical words
 - Shift from referential questions (“Where is the Iditarod held?”) to descriptive questions (“Tell me something about the Iditarod.”)
 - Determine evaluation protocols, based on the descriptive teaching and review provided to the student

Visual Support Materials

- Start with a NALB for any student with a voice output device with a robust vocabulary
- Make additional visual support materials to supplement the NALB to use in specific educational lessons (Robin Hurd, 2007, AAC Institute Symposium)
 - Make materials on a daily basis that emphasizes critical words for specific lessons
 - Modify curriculum materials on specific topics

Make-Over “Jobs”

- For students with limited vocabulary in their AAC device, make a NALB with as many core words as available (50+)
- For students with robust AAC systems, make a student-specific “At-A-Glance” display of 300 – 400 words for use in the classroom, home, and therapy
- Collaborate with the teacher to improve each other’s communication partner skills
- Confer with the teacher to decide what other classroom supports she/he needs in order to promote generative language in the classroom

CONCLUSION

- Implementing an Extreme AAC Make-Over involves
 - Changing Stuff
 - Vocabulary
 - Designs
 - Bridges
 - Changing Our Behavior
 - Model
 - Prompt
 - Respond
- The OUTCOMES are worth the remodeling efforts
 - Improved language skills
 - Improved life after school
