

Improving Literacy Outcomes for Students with Complex Communication Needs

Janice Light and David McNaughton
Penn State University

Presentation at the PDE Annual Conference
March 2012

Importance of literacy skills

- Literacy skills
 - Enhance cognitive development & advance learning
 - Allow fuller participation in education
 - Increase access to employment opportunities
 - Facilitate use of technologies (e.g., Internet)
 - Support social relationships (e.g., email, texting)
 - Foster personal expression (e.g., blogs)
 - Allow access to enjoyable leisure pursuits

Students with complex communication needs

- Some students have complex communication needs (CCN) resulting in limited or no speech
 - E.g., students with autism spectrum disorders, cerebral palsy, developmental apraxia, Down syndrome, multiple disabilities
- For students with CCN, literacy skills assume even greater importance
 - Expand communication options significantly
 - Enhance self-esteem
 - Increase perceptions of competence
 - Provide a visual support for language learning

Literacy outcomes for students with CCN

- Unfortunately, many students who have CCN
 - do not have basic literacy skills or
 - are underachieving in literacy compared to their typically developing peers
- These poor outcomes result from
 - Low expectations for these students
 - Lack of appropriate evidence-based instruction adapted to meet the needs of individuals who have limited or no speech

Goals of presentation

- Share evidence-based intervention designed to enhance the literacy skills of individuals with complex communication needs /limited speech
 - Describe intervention
 - Target skills, instructional procedures, materials
 - Share case examples to illustrate intervention and outcomes
- Project is part of a large federally-funded research grant
 - Funded by the National Institute on Disability and Rehabilitation Research (NIDRR) as part of grant # H133E030018

Components of effective evidence-based literacy intervention

- Sufficient time allocated for instruction
- Appropriate instructional content
- Appropriate instructional procedures
- Adaptations to allow active participation of individuals with limited or no speech
- Positive rapport and motivating instruction

Sufficient time allocated for literacy instruction

- Current best practices recommend
 - All students in grades 1-3 receive at least 90 minutes of literacy instruction per day
 - At risk students should receive an additional 40-60 minutes of instruction per day
- Ensure sufficient time is allocated for literacy instruction for students with CCN
 - Start literacy instruction at early age
 - Ideally provide instruction on a daily basis
 - However, our research demonstrates that significant literacy gains can be achieved
 - Even if the amount of instruction is less than ideal
 - Even with older students

Appropriate instructional content

- Instructional content based on recommendations of National Reading Panel (2000)
 - Reading to students & talking about texts
 - Phonological awareness skills
 - Sound blending skills
 - Phoneme segmentation skills
 - Letter-sound correspondences
 - Decoding skills
 - Sight word recognition skills
 - Reading and understanding books / other texts
 - Early writing skills

Appropriate instructional procedures

- Instructional procedures /teaching methods based on recommendations of National Reading Panel (2000)
 - Direct instruction in basic skills
 - Frequent opportunities to apply these skills in the context of meaningful, motivating literacy activities

Appropriate instructional procedures
Direct instruction in basic skills

- Model
 - Instructor demonstrates the skill
- Guided practice
 - Instructor provides scaffolding support to help student perform skill successfully
 - Gradually fades scaffolding support
- Independent practice
 - Student performs skill independently
 - Instructor provides feedback

Appropriate instructional procedures
Direct instruction in basic skills

- Feedback
 - If student performs skill correctly
 - Instructor provides positive feedback
 - If student is incorrect
 - Instructor directs student's attention to error
 - Models the correct response
 - Provides guided practice for student to ensure success
 - Provides additional opportunities for independent practice

Appropriate instructional procedures
Applying skills in meaningful literacy activities

- Provide frequent opportunities to apply skills in meaningful literacy activities
 - Demonstrate purpose of instruction
 - Establish that reading/writing are meaningful & fun
 - Increase motivation for learning to read & write
 - Enhance generalization of skills
 - Encourage generalization to new materials /contexts
 - Provide additional opportunities to practice skills
 - Build fluency in basic skills
 - Practice integration of skills required to read and write

Adaptations for students who have limited or no speech

- Adapt procedures to accommodate unique needs of individuals who have limited or no speech
 - Eliminate the need for spoken responses
 - Modify tasks
 - Provide alternative response modes
 - pictures, letters, words, signs as response options
 - Provide insight into areas of difficulty to support instructional decisions
 - Systematic foils and error analysis
 - Compensate for lack of oral production /rehearsal
 - Model oral production /rehearsal for student
 - Encourage internal subvocal rehearsal – “say it in your head”

Positive rapport & motivating instruction



- Build intrinsic motivation for learning
- Ensure rapport is positive & instruction is motivating
 - Build on student strengths
 - Capitalize on student interests
 - Develop positive relationship
 - Focus on instruction /Ignore extraneous behavior
 - Celebrate student success

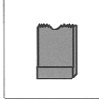

First steps in literacy intervention

- Target the following skills
 - Read interesting, motivating books to the student & talk about the books
 - Teach phonological awareness skills
 - Sound blending skills
 - Phoneme segmentation skills
 - Teach letter sound correspondences

Instruction in sound blending



- Goal
 - The student will blend phonemes presented orally in sequence & determine the target word
- Task
 - Present 4 or more AAC symbols & label orally
 - Say the target word orally with each phoneme extended 1-2 seconds
 - Student must blend the phonemes & point to the AAC symbol or say/sign the word






Instruction in phoneme segmentation

- Goal
 - The student will match a target phoneme presented orally to the AAC symbol that starts with the phoneme
- Task
 - Present 4 or more AAC symbols & label orally
 - Say target phoneme e.g., /b/
 - Show letter (e.g., b) at the same time
 - Student must point to the AAC symbol of the word that starts with the target phoneme or say/sign the word

Instruction in letter sound correspondences

- Goal
 - The student will match a target phoneme presented orally to the correct letter
- Task
 - Present 4 or more letters
 - Say the target phoneme e.g., /b/
 - Student must point to the letter that represents the target phoneme

m	t
a	b

Progression of instruction in letter-sound correspondences

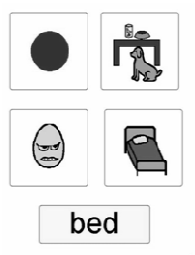
- Teach letter sounds, NOT letter names
- Introduce letters/sounds incrementally in the following sequence:
 - a, m, t, p, o, n, c, d, u, g, h, f, i, s, b, l, e, r, w, k, x, v, y, z, j, q
 - Teach lower case letters first
 - Teach letters that are used most frequently first
 - Separate letters that are similar
 - Teach short vowels before long vowels
 - Teach clusters/blends once most single letter-sound correspondences are mastered
 - Teach upper case once lower case is mastered

Next steps in literacy instruction

- Once student
 - Is competent with sound blending and
 - Knows approximately 6-7 letter-sound correspondences
- Teach
 - single word decoding
 - shared reading activities
 - sight word recognition skills
- Continue to
 - Teach new letter sound correspondences; review known ones
 - As student learns new letters and sounds, introduce new decoding words
 - Practice phonological awareness skills; build fluency
 - Read to the student & talk about the text

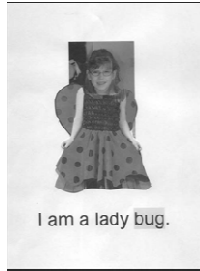
Instruction in single word decoding

- Goal
 - The student will decode a written word & match it to the correct AAC symbol or say/sign the word
- Task
 - Present 4 or more AAC symbols
 - Present the target written word
 - Student must read the word and point to the AAC symbol of the target word or say/sign the word



Instruction in shared reading

- Provide opportunities for students to apply decoding skills during shared reading
 - Highlight target words in the text for the student
 - Read sentence out loud and track words with finger; pause at the highlighted target word
 - Student must decode highlighted target word and
 - select the AAC symbol of the target word from communication display or SGD
 - Say or sign the word
- Gradually increase the number of target words until students are reading full sentences



Instruction in sight word recognition

- Teach sight word recognition
 - Highly motivating words that are too complex to decode
 - Irregular words that are frequently occurring
- Goal /task
 - Present 4 or more written words
 - Say the target sight word
 - Student must select the correct written word
 - Use this task if sight words are not easily imaged

Spiderman	Power Ranger
Thomas	school

Next steps in literacy instruction

- Continue to expand decoding skills
 - Gradually increase breadth of vocabulary
 - Introduce longer words
 - regular cvcc words (e.g., wind, fast)
 - regular ccvc words (e.g., stop, flag)
 - Introduce simple decoding rules
 - silent e /long vowel
- Continue to expand sight word recognition skills
 - High interest words that are difficult to decode
 - High frequency words that are irregular /difficult to decode
- Provide opportunities to apply decoding & sight word skills during shared reading
 - Gradually increase the number of target words until students are reading full sentences

Building reading comprehension

- Reading comprehension is complex
 - track through sentence from left to right
 - decode or recognize by sight each word in sequence
 - access meaning of words
 - process all words in sequence to derive meaning of sentence (or longer text)
 - relate meaning to prior knowledge /experience to comprehend text
- Introduce reading comprehension strategies
 - E.g., Summarization strategy
 - Generating questions
 - Answering questions

Ensure basic comprehension skills

- Goal
 - Student will
 - decode or recognize by sight each word in sentence in sequence
 - access meaning of words
 - process all words in sequence to derive meaning of sentence (or longer text)
- Task
 - Present 3 or more pictures /illustrations
 - Choose foils carefully
 - Present the written text
 - Student must read the sentence and point to / select the correct picture
- Alternative Task
 - Student summarizes text using speech, sign, or AAC symbols/ pictures
 - Who? What happened?

Answering reading comprehension questions

- Student reads the text
 - Initially student reads one page; answers question
 - Reduce working memory demands
 - Later reads several pages; then answers questions
- Instructor asks appropriate questions
 - Start with simple factual questions
 - Later introduce more complex inference questions
- Student may respond via
 - Speech
 - Signs
 - Pointing to pictures or written choices /multiple choice questions
 - Typing answers /using letter cards

Building writing skills

- Writing skills are critical in today's society
 - Increased importance with advent of technology
- Writing should be an integral part of literacy instruction
 - Often neglected
 - Teach writing skills in parallel to reading skills
- Learning to write is more difficult than learning to read
 - Writing imposes additional working memory demands
 - Requires learner to dynamically encode (Ehri, 2000)

Skilled writing

- Skilled writing requires integration of
 - Skills in narrative, expository, persuasive or other genres
 - Semantic, syntactic, & morphological skills
 - Phoneme segmentation
 - Letter sound correspondences
 - Sight word skills /spelling of irregular words
 - Keyboard knowledge (or handwriting skills)
 - Knowledge of conventions of writing
 - e.g., capitalization, punctuation

Writing instruction

- Teach basic skills
 - Phoneme segmentation skills
 - Letter-sound correspondences
 - Keyboard knowledge
 - Encoding skills – single words
- Provide opportunities to apply skills in meaningful writing activities
 - Telling stories
 - Use photos or pictures as visual supports
 - Start with familiar motivating experiences
 - Publishing books
 - Use the books for reading activities
 - Share books with others

The art and science of literacy intervention

- The science of literacy intervention
 - Implement effective evidence-based instruction
 - Sufficient time allocated for instruction
 - Appropriate instructional content / skills
 - Effective instructional procedures
 - Adaptations to allow active participation of individuals with autism who have limited speech
 - Positive rapport and motivating instruction
 - Monitor effectiveness with each student
 - Adapt as required to ensure individual success

The art and science of literacy intervention

- The science alone is not enough
- The “art” of literacy intervention is critical
 - the belief and the commitment to the right of all individuals to have the opportunity to learn & seek their full potential

Additional resources

- Websites
 - Light, J. & McNaughton, D. *Literacy instruction for learners with autism, cerebral palsy, Down syndrome and other disabilities*. <http://aacliteracy.psu.edu>
 - AAC at Penn State <http://aac.psu.edu>
- Webcast
 - Light, J. & McNaughton, D. (2006). *Maximizing the literacy skills of individuals who require AAC*. Webcast presented through the AAC-RERC. www.aac-rerc.com
- Publications
 - Light, J. & McNaughton, D. (2009). *Accessible Literacy Learning (ALL) Curriculum: Evidence-based reading instruction for learners with autism, cerebral palsy, Down syndrome and other disabilities*. San Diego, CA: Mayer-Johnson
 - Light, J. & McNaughton, D. (in press). Literacy intervention for individuals with complex communication needs. In D. Beukelman & P. Mirenda. *Augmentative and Alternative Communication: Supporting children and adults with complex communication needs*. Baltimore, MD: Brookes Publishing Co.
 - Light, J. & McNaughton, D. (2009). Meeting the demands of the curriculum for conventional and advanced readers and writers who require AAC. In G. Soto & C. Zangari (Eds.), *Practically Speaking: Language, literacy, and academic development for students with AAC needs*. Baltimore, MD: Paul H. Brookes Publishing Co.
 - Light, J., McNaughton, D., Weyer, M., & Karg, L. (2008). Evidence-based instruction for individuals who require augmentative and alternative communication: A case study of a student with multiple disabilities. *Seminars in Speech and Language, 29*, 120-132.

Acknowledgements

- This research is funded by the National Institute on Disability and Rehabilitation Research of the U.S. Department of Education through the AAC-RERC under grant # H133E030018. The opinions contained in this presentation are those of the grantee and do not necessarily reflect those of the U.S. Department of Education.
- We are especially grateful to the students and families who participated in this project.
- We also wish to thank the undergraduate and graduate students at Penn State who assisted with this research
- For further information, contact
 - Janice Light JCL4@psu.edu
 - David McNaughton DBM2@psu.edu
