An Evaluation of an Early Literacy Program for Students with Severe Disabilities

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Session Overview

• Project RAISE
• Early Literacy Skills Builder
• Research Outcomes to Date
• Story-based Lessons
Project RAISE at UNC Charlotte

• **Project RAISE**
  - Funded by Institute for Education Science (H324K040004)
  - Focus is literacy for students with moderate and severe disabilities in grades K-5
  - Diane Browder & Claudia Flowers, Co-Investigators

• **Diane M. Browder & Claudia Flowers, Co-Investigators**
  - Fred Spooner, Faculty
  - Lynn Ahlgrim-Delzell, Candice Meyer, Josh Baker, Research Associates
  - Tracie-Lynn Zakas and Angel Lee, School Liaisons
  - Pam Mims & Kelly Carmola, Trey Willis, Graduate Assistants
Contrast “Science of Reading” and Focus for Students with Severe Disabilities

- National Reading Panel summary (2000)
  - Phonemic awareness
  - Phonics
  - Fluency
  - Vocabulary
  - Comprehension

- Research with students with moderate and severe developmental disabilities
  - Sight words
    - Rarely measured comprehension of the sight words
A New Model of Literacy

Browder, D.M., Gibbs, S.L., Ahlgrim-Delzell, L., Courtade, G., Mraz, M., & Flowers, C. (In press). Literacy for students with severe developmental disabilities—what should we teach and what should we hope to achieve? Remedial and Special Education.

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Challenges for Teaching Reading

• Early literacy programs often assume verbal skill
  – Many students are nonverbal or limited verbalizations
• May lack language skills to develop meaning from text
Our Research

• Development of a curriculum-
  – Early Literacy Skills Builder
• Development of an assessment-
  – Nonverbal Literacy Assessment
• Randomized trials comparison of ELSB and sight word approach (5 year study) with students with autism and intellectual disabilities
Early Literacy Skills Builder

• Two Parts
  – Building with Sounds and Symbols
  – Building with Stories


www.attainmentcompany.com
ELSB: Building with Sounds and Symbols

- Students learn vocabulary, phonemic awareness, listening comprehension, conventions of print
- Bridges to beginning reading program
ELSB: Building with Sounds and Symbols

• Uses principles of systematic and direct instruction to promote mastery of the objectives for each level while also maintaining motivation through a “fun” lesson.
ELSB: Building with Sounds and Symbols

• Teaches students to make responses to comprehension questions (supported comprehension); and then gradually shape them from literal to sequencing and inference
ELSB: Building with Sounds and Symbols

• Teaches vocabulary (picture and word) that is both functional and applicable to the activities in the lessons
ELSB: Building with Sounds and Symbols

• Gradually introduces phonological awareness emphasizing phonemic and text awareness skills supported by research as most functional for preparing children to read
ELSB: Building with Sounds and Symbols

• Uses lesson mastery tests to determine when to move to the next level
ELSB: Building with Sounds and Symbols

• Prepares students to enter an early reading program by giving them a foundation in the phonemic, text awareness, and other skills needed
  – E.g., students move to Reading Mastery
ELSB: Objectives

- **Flashcard Game** – Student reads vocabulary words using time delay, then uses words to fill in sentences.
- **Text Pointing** – Student points to text as teacher reads.
- **Missing Word Game** – Student points to word that completes a repeated story line.
ELSB: Objectives

• **Comprehension** – Students respond to literal questions about story.

• **Chunking Words** – Students demonstrate understanding of segmentation by clapping out syllables in words.

• **Tapping Out Sounds** – Students demonstrate understanding of segmentation by tapping out letter sounds in CVC words.
ELSB: Objectives

• **Letter Sounds** – Students identify letter-sound correspondences.

• **First Sounds Game**
  – Students point to/say first sounds in words.

• **Finding Pictures with Special Sounds**
  – Students identify pictures that begin with named sounds.
ELSB: Objectives

- **Stretching Words** – Students point to letter sounds in words.

- **Finding Pictures** – Students point to pictures that match segmented words.

- **The Picture Game** – Students point to pictures representing new vocabulary words.

- **Fun with Writing** – Students complete one page of their own book.
Research on ELSB: Population

– In grades K-5
– Classified as having moderate/severe ID or autism with IQ below 55
– Adequate hearing and vision to respond to verbal instructions and printed materials
– Some progress in English instruction if ESL
– Able to participate in assessment with or without assistive technology
– Adequate attendance at school
Year One: Participants and Setting

- Seven classrooms
  - 2 autism
  - 2 mod/sev
  - 3 sev/prof
- 23 met eligibility requirements
  - N=11 treatment
  - N=12 control
- Mean IQ 41 (sd 12.67)
Design

• Group experimental study
• Randomly assigned students to treatment
• Pre/post testing in September and April/May
Dependent Variables

• Measures
  – Nonverbal Literacy Assessment
  – Early Literacy Skills Assessment
  – PPVT III
  – Woodcock Language Proficiency Battery
    • Memory for Sentences
    • Letter-Word Identification
Comparison of Treatments

- Experimental
  - Early Literacy Skills Builder
    - Includes phonemic awareness/phonics

- Control
  - Sight words and pictures
    - Edmark or flash cards

- Both
  - Participation in story reading with systematic instruction (“Story-based lessons”)
Implementing the ELSB

- Teachers trained to follow scripted
  - Fidelity: mean 93%
- Repeated lessons
  - 2, 4, or 10 day cycle
- Taught to mastery
  - Moved to next level when 75% correct on lessons
- Small group or 1:1
Shared Intervention

• Experimental and Comparison Groups received story-based lessons
  – Mean procedural fidelity of 85%

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Dependant Measures

• Standardized measures
  – WLPB – subtests letter-word identification, memory for sentences
  – PPVT III

• Measures designed for this study
  – Nonverbal Literacy assessment – measures conventions of reading, word study, letter sounds, syllabication, blending sounds
  – Pretest/posttest measure for the curriculum-
    Early Literacy Skills Builder
Was there a difference in outcomes for ELSB versus control? YES

• Due to sample size, effect size may be most meaningful outcome measure
• Despite small sample, significant differences found in Year 1 for
  – Measures developed by researchers
    • For pre/post for objectives in the curriculum
    • For phonics/ PA skills
  – Other standardized measures
• No difference in conventions of reading
  – Remember both received story-based lessons
## Effect Size for NVLA & ELSA: Researcher Developed Measures

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*Note.* **$p$**<.01, *$p$*<.05. Degrees of freedom for all tests of significance was 1, 21.
Interaction effects for the measures NVLA and ELSA

NVLA Total

CVR Total

Phon Sk

CBA
Interaction effects for the measures PPVT III & WLPB

PPVT III

WLPB Total

Memory for Sentences

Letter Word Identification
Summary of Yr 1 Findings

• Curriculum could be developed; validated for this population
  – Those in it learned more objectives than those not receiving it
• Significantly higher on phonics section of NVLA for ELSB group
  – But slow gains
• No difference Conventions of Reading
  – Both received SBL
• Able to use a standardized assessment
Year 2 Replication

• RAISE is a 5 year project
  – To have sufficient power for statistical analysis will use first year data from all participants for treatment comparison

• 2nd Year Replication
  – ALL control students used Edmark and procedural fidelity was measured for control as well as treatment
## Participants in Year 2

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Results for Year 2

- For every measure, greater increase on posttest compared to pretest for experimental (ELSB) versus control (Edmark)
- Effect size showed strong effects for some measures
- Insufficient power to show statistical significance due to sample size and amount of variance
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Both Groups Gained: ELSB gained more

Figure 1: NVLA Total Score

Group Membership
- control group
- treatment group
Control Students Learning Some Phonics in Story Lessons: ELSB Learned More

Figure 3: PhonSk

Group Membership
- control group
- treatment group
Story Lessons Promote Conventions of Reading for Both

Group Membership
- control group
- treatment group

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Some Differences Show Up on a Published Instrument- PPVT III
And on Woodcock Language Proficiency

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Limitations

• Group randomized trials and a low incidence population
  – Lack of power for statistical analysis; high variance

• Using instruments developed by investigators
  – Building a validity argument for the NVLA as we use it (strong test-retest; standardized administration; strong interrater)
Story-Based Lessons for Students with Significant Disabilities

A Quick Overview of
• Adapting Books
• Teaching Story Based Lessons
General Reading Curriculum*

• We use books that are grade and age appropriate
  – Promotes access to the general curriculum
  – Aligns with state standards by teaching the same curriculum
  – Creates opportunity to experience the literature of students’ age/grade level

(*Based on Chapter 2, Teaching Language Arts, Math, & Science to Students with Significant Cognitive Disabilities)
Why Adapt Books?

• Challenge of the text
  – Are not able to read the words
  – Short attention spans vs. amount of text if read aloud
  – Limited receptive vocabulary

• Challenge of the book
  – May not be able to hold/manipulate book
  – Book may be too “fragile” for students’ motor planning
How to Shorten/Rewrite Text

• Pre-read text
• Summarize text to capture main idea, provide details
• Add graphics (picture symbols) to key vocabulary
• Use Repeated Story Line to support main idea of each passage
Add text cues

• Add text cues that the student will help you read
  – Repeated story line that is the “Big Idea” of the story
  – Story line may contain picture symbols that the student will select or “read” with AT
Physically alter the book

- Take book apart and mount on sturdy material; laminate
- Put pages in 3 hole sheet protectors
- Use page “fluffers” (sponge, big paper clip, bag clip, foam) or tabs for ease of turning
- Provide objects to represent major concept in the story
Assistive Technology: Examples

- Big Mac™ Voice output (Ex: Repeated Story Lines)
- Cheap Talk-offers array of choices (Ex: Prediction Question; Comprehension)

(Browder & Spooner, p. 80)
Other Adapted Books

• Baltimore City Schools
  www.baltimorecityschools.org/boardmaker/results
  Must use Boardmaker software to open

• General Curriculum Access Website:
  http://education.uncc.edu/access
  Must use Writing With Symbols software to open. Task Analysis provided for saving, opening, printing books from website.
How to Teach a Story Based Lesson

In 10 Easy Steps
Step 1: Anticipatory Set

- Present an object that can be accessed through at least one of the five senses to represent a major theme and create an aire of anticipation

Example: Elmer
You can give the students an Elmer Elephant, show a small elephant toy, show a picture of an elephant, make mud with dirt and water.

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Step 2: Read the Title

- The teacher will read, label, and point to the title. Every student will have an opportunity to touch and/or read the title.

Example: Teacher says “This title of our book is ‘Elmer’. Can you touch the title?”
Step 3: Read the Author’s Name

• The teacher will read, label, and point to the author’s name. Every student will have an opportunity to engage with and/or read the name.

Example: Teacher says “This author of our book is David McKee. Can you touch the author’s name?”
Step 4: Model Opening the Book

• The teacher hands the book to one student and ask the student to get the story started

Example: “Can you help us get our story started?”
Step 5: Ask a Prediction Question

- The teacher shows the students the cover page and may “take a picture-walk” through the text. S/he will ask the students what they think the story will be about? The child may choose from pictures, objects, or give a verbal response.

Example: “Do you think our book will be about an elephant or an apple pie?”
Step 6: Text Point

• The teacher will read and point to the text. A specific sentence will be highlighted, and the students will have the opportunity to point to the text and “read” with the teacher.

Example: “Elmer the elephant is bright colored, patchwork all over.”
Step 7: Identify Vocabulary

• The teacher will identify one or two vocabulary words that apply to the story. These words may be highlighted throughout the text.

Example: The vocabulary for Elmer may be *elephant* and *happy*. 
Step 8: Read the Repeated Story Line

• The teacher selects a line that represents a central theme throughout the story. This line can be added into the story. Students will have the opportunity to point to and “read” the repeated story line.

Example: “Elmer was not happy”.
Step 9: Turn the Page

• Every student is given the opportunity to assist the teacher in continuing the story by responding to a verbal cue.

Example: “Can you keep our story going?”
Step 10: Comprehension Questions

- The teacher asks each child a comprehension question. The question may be a literal, inference, or summary question.
- The comprehension question may also be derived from Bloom’s Taxonomy

Example: “What kind of animal was Elmer?”
Final Reminders

• All students may respond differently to each requested task. Modes of responding may include
  • Voice-Output Devises
  • Picture Symbols
  • Objects paired with text
  • Pointing
  • Eye-gaze
  • Verbal
  • Sign language
Reference for First Year Outcomes


  – Also see [www.attainmentcompany.com](http://www.attainmentcompany.com) for reprint.