Literacy for students with disabilities: Using individualized responses, systematic instruction, and assistive technology

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What We Know about Literacy and Students with Moderate and Severe Intellectual Disability

- Literacy has been underemphasized
- Sight words have been overemphasized
- Some students with moderate and severe intellectual disability can learn to read
- Other students can learn to gain meaning from text
- Read alouds can promote literacy skills for all students
Implications for Planning Literacy

Project RAISE: Literacy for Students with Moderate/Severe DD

- 96 students participated in ELSB
- 27 of these students went on to become beginning readers
- 21 students needed a new alternative
Current Study

Creating Success Through Shared Stories

- Blyden (1988) showed
  - increase in attention
  - improvement in receptive and expressive language
  - increased eye contact
  - better posturing
  - greater social interactions

- Browder, Mims, Spooner, Ahlgrim-Delzell, and Lee (2009)
  - multiple probe across participants
  - evaluate methods for providing literacy instruction
  - three students with multiple disabilities

  - multiple probe across materials
  - examine the effects of least to most prompts
  - number of comprehension questions answered correctly during shared stories

- In both studies students showed gains in literacy skills such as anticipating a repeated storyline and comprehension
Limitations of Current Research

- Neither of these studies used the teacher as the interventionist
  - It is important to know if an intervention can be carried out effectively by the teacher

- Both of the previous studies used a systematic approach to shared stories via a task analysis as opposed to scripted instruction
  - The use of scripted instruction provides additional consistency throughout the shared story, across books and across teachers
Purpose and Questions

- The **purpose** of this study is to expand on current research using systematic instruction and individually defined responses for students with multiple disabilities who require assistive technology to participate in shared stories.
- There are two **research questions**:  
  - What is the effect of systematic instruction and individually defined responses on the listening comprehension of students with significant disabilities?  
  - What is the effect of systematic instruction and individually defined responses on scores on engagement steps on a literacy based task analysis?
Participants and Settings

- **Student 1: Donna/Eye gaze response**
  - 8 yr old student in a self-contained classroom
  - primarily uses an eye gaze to communicate but is able to use her hands inconsistently
  - nonverbal, in a wheelchair, and uses objects for communication
  - has been exposed to story based lessons in previous years but has made little progress

- **Student 2: Denise/Object response**
  - 9 year old student who attends a segregated school
  - visually impaired; she uses auditory skills and tactile exploration to respond to request
  - nonverbal and is beginning to use objects to represent daily activities
  - teachers have been unsure how to best provide instruction for her
  - first experience with story based lessons
Participants and Setting con’t

- Student 3: Ralph/Touch response
  - 6 year old boy who attends a separate school
  - nonverbal, has functional vision, and uses a wheelchair for mobility
  - responds to request by grabbing what he wants
  - Ralph’s teacher often read books to her students, this is Ralph’s first experience with story based lessons

- These students attend three different classrooms in a large urban school system

- Instructional settings include
  - Student’s classroom
  - A reading room
Materials

- Two adapted books: “Earth Dance” and “Dewey McGee Loves a Good Game”
  - Each book has been adapted by adding objects to the story, pictures or objects to complete a repeated storyline, an object to be used for an anticipatory set and summary question
- A story based lesson script individualized to the response mode of the student
- A photograph of the student labeled with the student’s name
Experimental Design

- A quantitative, single subject, multiple probe across response modes (Horner & Baer, 1978; Tawney & Gast, 1984) to examine the effects of systematic instruction and individually defined responses on listening comprehension and engagement steps on a literacy based task analysis.
The independent variable in this study is the script the teacher receives:
- Each script has been individualized for:
  - Presentation of materials
  - Student responses
  - Prompting for incorrect responses
**Script for student with eyegaze response**

<table>
<thead>
<tr>
<th>Teacher Says:</th>
<th>Teacher Does</th>
<th>Student Does</th>
<th>Prompting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Now, let me ask you a question about what we just read. What flew off of Dewey’s head? A hat or ____?</td>
<td>Present the student with the hat and a distracter that has been velcro’ed to an eye gaze board.</td>
<td>Looks at both objects and then at hat for 3 seconds</td>
<td><strong>Error correction</strong> If student clearly chooses the wrong object, remove the distracter and say: <em>This is the answer, a hat flew off of Dewey’s head. Look at the hat.</em> Remove the hat and show it to the student. <strong>If no response</strong>, Say “Let’s read that again.” Read the text again, present the two answer choices and repeat the question. If correct praise. <strong>If no response</strong> 5 seconds attempt, Say “Listen to the question again, “What flew off of Dewey’s head?” Hold up or touch the hat and say “Here’s the answer, the hat flew off Dewey’s head.” Put the hat back down with the distracter and say “Now you try. “What flew off of Dewey’s head? <strong>If no response</strong> after 5 seconds, place student’s hands on the hat and say “Here it is. The hat flew off of Dewey’s head.”</td>
</tr>
</tbody>
</table>
Choose a book
After both book choices have been presented, the student clearly indicates which book she would like to read.
Teacher responds: Great! You chose______.

If an error occurs:

When asked to choose a book this student tapped both books at the same time

The teacher responds by choosing a book and making sure the student eye gazes to the choice
Repeated Story Line

Student: Uses assistive technology to complete a repeated story line that the teacher has begun.

Great job! You helped me read!

If student does not press switch within allotted time follow this prompting sequence:

1. Provide a visual cue such as tapping the switch. Then wait for the student to respond. If student presses switch after visual cue, PRAISE and continue reading.

If no response, provide hand over hand assistance. Reinforce by saying “Good job! You helped me read.”
Dependent Variables

- Two variables measured
  - The number of independent correct responses on targeted listening comprehension steps
    - Including answering literal questions throughout the story
    - Answering a summary question
    - Completing the repeated storyline
Dependent Variable cont.

- The student score reflects the level of engagement in the literacy activity.
- Each step has a continuum of responses, each with a different point value:
  - Choose a book
  - Select own picture
  - Engage with anticipatory set
  - Prediction
  - Engage with objects in story
  - Find symbol representing a word
DATA COLLECTION
<table>
<thead>
<tr>
<th>Teacher:</th>
<th>Student response =0</th>
<th>Student Response =1</th>
<th>Student Response =2</th>
<th>Student Response =3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Present a choice of two books</td>
<td>No response/looks away</td>
<td>Looks at something other than choices</td>
<td>Glances at both/either book, 1-2 seconds</td>
<td>Looks at both books, then Dewey McGee for 3 seconds</td>
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<td></td>
<td>5 5 M P</td>
<td>5 5 M P</td>
<td>Reinforce!</td>
<td>Reinforce!</td>
</tr>
<tr>
<td>Provide an opportunity to let student select own picture paired with a disparate distracter</td>
<td>No response/error</td>
<td>Looks at something other than choices</td>
<td>Scans both pictures, 1-2 seconds</td>
<td>Looks at both pictures then own picture for 3 seconds</td>
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<td>5 5 M P</td>
<td>5 5 M P</td>
<td>Reinforce!</td>
<td>Reinforce!</td>
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<tr>
<td>Provides opportunity for student to interact with the baseball</td>
<td>No response</td>
<td>Looks at reader or book</td>
<td>Glances at baseball, 1-2 seconds then looks away</td>
<td>Holds gaze on baseball for 3 seconds</td>
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<td>5 5 M P</td>
<td>5 5 M P</td>
<td>Reinforce!</td>
<td>Reinforce!</td>
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<tr>
<td>Asks student what story will be about; uses baseball and distracter</td>
<td>No response</td>
<td>Looks at reader or book</td>
<td>Scans both objects, 1-2 seconds</td>
<td>Holds gaze on one object for 3 seconds</td>
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<td>5 5 M P</td>
<td>Reinforce!</td>
<td>Reinforce!</td>
</tr>
<tr>
<td>Present opportunity for student to &quot;read&quot; page (hat) with you</td>
<td>No response</td>
<td>Looks at reader or book but not hat</td>
<td>Glances at hat, 1-2 seconds</td>
<td>Holds gaze on hat for 3 seconds after teacher request</td>
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<td>5 5 M P</td>
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<td>Reinforce!</td>
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<tr>
<td>Using hat, and a distracter object, ask a literal question</td>
<td>No response/error</td>
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<td></td>
<td>Looks at both objects, then hat for 3 seconds</td>
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<td>5 5 5 V M P</td>
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<td>Reinforce!</td>
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<tr>
<td>Activity</td>
<td>Response</td>
<td>Gaze Interaction</td>
<td>Reinforcement</td>
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<tr>
<td>Present opportunity for student to &quot;read&quot; page (juice box) with you</td>
<td>No response</td>
<td>Looks at reader or book but not juice box</td>
<td>Holds gaze on juice box for 3 seconds after teacher request</td>
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<td>Reinforce!</td>
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<td>Glances at juice box, 1-2 seconds</td>
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<tr>
<td>Using juice box, and a distracter object, ask a literal question</td>
<td>No response/error</td>
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<td></td>
<td></td>
<td>Glances at juice box, 1-2 seconds</td>
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<tr>
<td>Present opportunity for student to &quot;read&quot; page (ball) with you</td>
<td>No response</td>
<td>Looks at reader or book but not ball</td>
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<td></td>
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<td>Glances at ball, 1-2 seconds</td>
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<tr>
<td>Using ball, and a distracter object, ask a literal question</td>
<td>No response/error</td>
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<td></td>
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<td>Glances at ball, 1-2 seconds</td>
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<tr>
<td>Provide opportunity for student complete RSL</td>
<td>No response/does not touch</td>
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<tr>
<td>Ask student to find symbol for baseball</td>
<td>No response</td>
<td>Looks at reader or book but not ball</td>
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<td></td>
<td>5 5 M P</td>
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<td>Ask student to find symbol for baseball</td>
<td>No response</td>
<td>Looks at reader or book but not baseball symbol</td>
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<tr>
<td>Ask a summary comprehension question at the end of book. Use Baseball and distracter</td>
<td>No response/error</td>
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Reinforce! indicates positive feedback to encourage the student's engagement and understanding.
Phases: Baseline

- teachers used the same two books
- a script to follow
- script included all of the target responses that were included during intervention
  - did not include detailed teacher presentation or prompting
  - Teachers were asked not to reinforce correct responses or to respond to incorrect responses
Phases: Intervention

- teacher was given a script for each of the books
- teacher was given several days to look over and become familiar with each script
- teacher used the script to conduct a story based lesson with the student
- the script determined
  - how materials are presented
  - how the student will respond
  - how the teacher will prompt any incorrect responses
Video clip: Student using touch response and object response

Literacy for 3 students with disabilities: Using individualized responses, systematic instruction and assistive technology
Results

- Donna
  - Steady gains in engagement.
  - Consistently met mastery criteria of 24/30 for the last 8 sessions
  - Comprehension results have been variable.
  - Mastery criteria of 6/7 met 3 times
  - IOA 97% across 20% of sessions
  - Generalization is built in
  - Maintained mastery criteria in maintenance phase
Results cont.

- Denise
  - Sharp increase in trend for engagement.
    - Has exceeded mastery criteria for engagement
  - Comprehension data has been variable
    - Mastery criteria for comprehension reached
  - OIA
    - 97% across 30% of sessions
  - Generalization is built in
  - Maintained mastery in maintenance phase
Results cont.

- **Ralph**
  - Steady gains in engagement
    - Has met mastery criteria
  - Comprehension has been variable
    - Has met mastery criteria
  - IOA
    - 94% across 30% of sessions
  - Generalization is built in
  - Maintained mastery for engagement
Discussion

- Students in this study received a great deal of individualized instruction.
- When a set of demands were placed on them, they showed they could tolerate the instruction and make impressive gains.
- This study adds to a small body of research by providing an additional model for literacy for students with the most significant disabilities.
- Addressed the limitation of previous studies by:
  - Using scripted instruction.
  - Having the teacher as the interventionist.
Limitations

- All instruction was provided in a 1:1 format. This may not always be realistic for consistent instruction
  - Future research should determine if similar results could be obtained using small group instruction
- The materials used were not equally difficult. One book was a published book, the other was a book written by a team member with a simpler theme and more concrete pictures
  - Future research should use books with similar lexile scores and with similar visual appeal
- Use of a script. It may not be realistic to script every lesson
  - Future research should explore ways in which systematic instruction could occur without having to script entire lessons
Implications for practice

- Scripts were easy to follow
- Teachers found the materials useful and something they would make for their own classroom
- Teachers were able to shape desired responses from students
- These responses will also apply to other activities
- Having the teacher as the interventionist decreased the gap between research and practice
Coming soon…..the materials and instructional strategies presented in today’s session will be published and available through:

Attainment Company
Questions:
- a.lee@uncc.edu
- http://education.uncc.edu/access