Improving Expository Speaking, Writing, and Comprehension for Students with LLD: A Researcher-Clinician Collaboration

Teresa A. Ukrainetz, Ph.D., S-LP(C)
Utah State University
Catherine L. Ross, M.S., CCC-SLP
University of Wyoming, retired
Amy Peterson, M.S., CCC-SLP
Laramie County School District 1

School SLPs: Learning Interventionists

• SLP Orientation
  – Individualized problem-solving orientation
  – Underlying processes, skills, & strategies
  – Freedom from but connected to classroom & curriculum
• SLP Instruction
  – Oral & written language through talking & listening
  – Explicit, systematic support
  – Repeated opps for learning and practice
  ➔ Improve language & learning skills & strategies

Learning Strategies: Taking & Using Notes

• Taking notes
  – Select info from the whole
  – Reduce to key words & phrases
  – Transform to visuals like icons, diagrams, graphs
  – Minimize writing, punctuation, spelling
  – Organize into groups and subgroups
• Using notes
  – Expand into full, well-formed sentences
  – Paraphrase from source
  – Combine from multiple sources
  – Organize into own product

Good Note-Taking is Hard

Hebert et al. (2014): Will writing help reading?
• 209 4th gr typical & LD in 3 conditions
  – Taking notes on key info from article
  – With note-taking form & one whole-class lesson
• Results
  – Improved rdg comprehension > re-reading article
  – Trend for notes > essay
BUT poor notes – little info; on only one aspect; ignore whole sections; include all or most or superfluous info; whole sentences & parags

Troubles continue for high school LD (Boyle & Forchelli, 2014)

Note Taking Techniques

• Guided
  – Lecture specific outlines with space for notes
  – Vary on specificity of prompts
• Strategic
  – Prompts to record X main pts, record X new vocab, summarize with main idea & X details
  – Quote, Summarize, Paraphrase
  – Mnemonics: CUES (Cluster, Use, Enter, Summarize)
• Annotating readings
  – Highlighting, linking, writing margin notes

(Boyle & Rivera, 2014; Boyle et al., 2014; Chang & Ku, 2014; Ciullo & Mason, 2017; Diaz, 2014)

Note-Taking Instruction

• Procedures
  – Systematic instruction over weeks
  – Identify info, take notes, organize notes, refer to notes
  – Demo, guided use, form info reduced over time
  – Explicit instruction to generalize over topics & subjects
• Outcomes
  – Improves note quality and quantity
  – Improves comprehension scores on taught topics
  – Mixed on generalization

(Boyle & Rivera, 2014; Boyle et al. 2014; Chang & Ku, 2014; Ciullo & Mason, 2017)
+ Oral Practice

- Learning & practice through talking
  - Making & using notes involves talking to yourself
  - Have you written enough of the right words?
  - Can you say the idea in your own words?
  - Will you remember the idea?
- Say it again and again
  - Well-formed paraphrased oral sentences
  - Alone, in chunks, and in whole reports
- Talking helps
  - Comprehension check and formulation practice
  - Makes notes helpful – even if you didn’t write much – and what you wrote is hard for you to read

Learning Through Oral Practice

- Reciprocal teaching (King & Parent Johnson, 1999; Lederer, 2000; Palincsar, 1986; Palincsar & Brown, 1984; Palincsar et al., 1987)
  - Reading strategies, e.g., summarize, ask qns
  - Students ask qns of other students with instructor support
  - External learning talk → internal learning talk
- Verbal rehearsal
  - Good for working memory & maybe comprehension (Peng & Fuchs, 2017; Poloczek et al., 2016)
  - And good for oral presentations!

So How Can SLPs Help?

1. Use note-taking and oral practice as teaching strategies
   - Improve expository knowledge, vocabulary, syntax, and discourse skills
2. Teach note-taking and oral practice as learning strategies
   - So students study better on their own

Ukrainetz and Ross combine clinical expertise, client values, and research evidence to develop a tx…

How About Pictography?

- Quick & easy, just enough to remember
- Pictog > write/draw for length & quality
  - McFadden (1998)
  - Ukrainetz (1998)

Student-Devised Key Word Plans

- From pictography into notes
- By students for students

Pictography in Action
Speak-and-Sketch Note-Taking Tx

**Shared reading** → say it simply → sketch it simply
→ say it fully → say it simply → note it simply → say it fully → write it fully 🎨

1. Quick & easy **pictography** of ideas extracted from text
2. Turned into concise, informative **bulleted notes**
3. With repeated **oral practice** of sentences & reports

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Research-based Elements of Effective Tx

**R** Repeated opportunities for skill learning
**I** Intensity of instruction
**S** Systematic support of targeted skills
**E** Explicit skill focus

+ Plus learner factor: attn, motiv, & engagmt

- Rdg tx res: Explicit, intensive, systematic, and supportive (Torgesen et al., 2004, Berninger et al., 2003)
- Lang tx res: Intensive, focuses attention, presents multiple trials, vary task complexity systematically, and reward progress (Gillam et al., 2001; Gillam et al., 2008)

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Speak-and-Sketch Tx: Group Experimental Study

What is the effect of 3 hrs of tx using science texts?
- For gr4-6 with language-related LD
- Vs. no-tx control condition
- On outcomes using history texts?
  1. Notes
  2. Oral reports
  3. Written reports
  + Perceptions from SLP instructors

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Participants

- 44 4th-6th graders from 9 schools
  - IEP with oral language, reading, or writing services
  - SLI, SLD, OHI
  - No intellectual disability, autism, emotional disability
- Assignment
  - Randomly assigned to tx or control conditions
  - Balanced (mostly)
  + Grade & CELF5 core language
  - IEP services, gender, ethnicity, free/red lunch
  - With 1+ tx participant per school

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Treatment Procedure

- 3 hrs of Speak-and-Sketch tx
  - 9 school SLP instructors
  - 2x/wk of six 30-min indiv or pair sessions
  - Regular or specially scheduled
  - Grade-level unusual animal articles
  - 2-column note form
- SLP training & fidelity
  - 3 group sessions
  - Practiced with non-study student
  - Tx observed and tweaked in first week
  - 1+ participant per SLP audio rec & a few video rec

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The **cassowary** is a species of large flightless bird. It is found in northeastern Australia and the island of New Guinea. The cassowary is closely related to emus and ostriches. It is the third tallest and second heaviest bird in the world…

950 lexile, 450 words

http://a-z-animals.com
Speak-and-Sketch Tx

<table>
<thead>
<tr>
<th>Pictography Notes</th>
<th>Bulleted Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Session 1</strong></td>
<td><strong>Session 2</strong></td>
</tr>
<tr>
<td>Preview &amp; review learning</td>
<td>Preview &amp; review learning</td>
</tr>
<tr>
<td>1. Read aloud &amp; locate some important/interesting ideas on form</td>
<td>1. Say full report from pictography</td>
</tr>
<tr>
<td>2. Start over, do pictography: Quick &amp; easy, just enough to remember</td>
<td>2. Say simply &amp; bullet note: Quick &amp; easy, just enough to remember</td>
</tr>
<tr>
<td>3. Say it fully, then say it again</td>
<td>3. Say it fully, then say it again</td>
</tr>
<tr>
<td>4. Revise if needed &amp; say it again</td>
<td>4. Revise if needed &amp; say it again</td>
</tr>
<tr>
<td>5. Say full report from pictography</td>
<td>5. Say full report from bulleted notes</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Article A</th>
<th>Article B</th>
<th>Article C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Session 3</td>
<td>Same as Session 1</td>
<td>Same as Session 1</td>
</tr>
<tr>
<td>Session 4</td>
<td>Same as Session 2</td>
<td>Same as Session 1</td>
</tr>
<tr>
<td>Session 5</td>
<td>Same as Session 1</td>
<td>Same as Session 1, #1-4</td>
</tr>
<tr>
<td>Session 6</td>
<td>Same as Session 2</td>
<td>5. Dictate written report from notes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>6. Compare report to article &amp; notes</td>
</tr>
</tbody>
</table>

Teaching Pictography

Tx 1: Model & Scaffold
Quick & Easy
Just Enough to Remember

Tx 1: Saying Full Sentences From Pictography

Tx 2 (or Tx 4 or 6):
Oral Report from Bulleted Notes

Testing Procedure

- Individual pretest & post-test sessions
  - Pre 1: CELF Core Language
  - Pre 2: Apache/Inca notes on 2-col form & oral report
  - Post 1: Inca/Apache notes on 2-col form & oral report
  - Post 2: Written report & comprehension test*
    - Audio-rec sessions & video-rec oral reports
- Testers
  - Trained UG RAs from UWyo & USU
  - Blind to tx condition
- Plus SLP instructor reflection essays after tx

Test Articles – Historical Peoples

**Apache Nation**
The Apache are one of the most famous Native American groups in the United States. Apaches were known as skilled horsemen and fearsome fighters...

**Inca Empire**
The Inca Empire was the largest kingdom in ancient times on the American continent. It covered the country of Peru and parts of Ecuador, Bolivia, Argentina, Chile, and Colombia...

850 lexile, 503 words

http://www.readworks.org/
https://lexile.com/analyzer/
1. Topic
   3 = Relevant topic at top
   2 = Topic identified in first item only
   1 = Topic ided other than only in first item
   0 = Topic not identified or incorrect

2. Bullets (Good) & Periods (Bad)
   3 = All items initiated with bullets and no items use periods (1 or ? ok)
   2 = >half items bullets, regardless of periods
   1 = Some bullets or <half no periods
   0 = No items have bullets

3. Quick & Easy
   3 = All brief items, info dense: lists, phrases, key words, abbrevs, sgw omitted, short
      sents, no category repetition
   2 = >half brief or reduced items
   1 = Half or fewer brief or reduced items
   0 = No brief items

4. Use Your Own Words
   3 = All own sentences or built from source sentences; no verbatimish sentences
   2 = >half own sentences
   1 = Half or fewer own sentences
   0 = No own sentences

Notes Rubric – Form

1. Important & Interesting Ideas
   3 = 9+ different items; 2 items for distinct multi-idea sentence even if verbatim
   2 = 6-8 items
   1 = 3-5 items
   0 = 2+ items

2. Just Enough to Remember
   3 = All items clear enough to generate sentence from categ and note
   2 = 1 confusing or inadequate item
   1 = 2 confusing or inadequate items
   0 = 3+ confusing or inadequate items

3. Use the Categories to Select and Organize
   3 = All categs have info and info fits categs
   2 = 3 categs have info that fits
   1 = 2 categs have info that fits
   0 = 1 or 0 category has info that fits

4. From the Article
   3 = All info matches source even if unclear
   2 = 1 idea not from source
   1 = 2 ideas not from source
   0 = 3+ ideas not from source

Notes Rubric – Content

Oral & Written Reports – Transcription & Analysis

• Systematic analysis of language transcripts (SALT v18, Miller & Iglesias, 2016)
• Segmented into C-units (sentences)
• Oral reports marked for pauses and mazes
• Written reports with corrected spelling or Xs
• 100% double checked by investigator

SALT semantics and syntax analyses confounded by verbatim sentences 😞

Oral & Written Reports: Relation to Notes & Source

Customized SALT codes:
1. Verbatim from source
2. Same as notes
3. Modified from notes
4. New, not in notes
5. Isolated group labels
6. Open/Close statements
7. Extraneous comments about presentation

Pre/Post Oral Report Holistic Comparison

• Overall quality of pre/post videos for each participant
  – Three RA raters blinded to pre/post status
  – Familiar with source articles

Results

Group Results on Notes & Oral Report
Individual Performance
SLP Instructor Perceptions

ASHA Convention, Nov 2017
Los Angeles, CA
• Post-test form = 41/44 written notes incl 1 mixed written & picto
• Bulleted notes form gain, Tx > Con, p = .006
• Content also carried in long verbatim notes

Beyond Group Averages: Case Examples

Student #A – Tracking learning & change
Student #B – Pictographic Notes Strategy
Student #C – Learning Strategies & Self-Regulation
This is what I learned about the axolotl.
The axolotl lives in two lakes in Mexico. The axolotl breathes underwater. Also the axolotl lives in fresh water in an aquarium. Axolotl looks like a fish that has legs. And the axolotl blends in to stuff because of its camouflage.
The axolotl eats worms small fish and crabs. The axolotl don’t chew their food but they suck it whole.
The axolotl female lays about one hundred eggs to one thousand eggs. People research about the axolotl.
I hope you learned something new.

#B — Pictographic Notes Strategy
- Longer oral report
- Longer sentences
- More vocabulary diversity
- 3/3 raters judged holistically better

#C — A Natural Gets Better at Presenting
Pre-test to Post-test
- MLU 6.4 vs. 8.3 words
- NTW 51 vs. 100 words
- NDW 35 vs. 65 words

- Neither had verbatim
- Post had fewer extraneous
- Post had better open/close
- Post had more paraphrased and new

3/3 rated Post holistically better

SLP Study Instructors’ Reflections on Speak-and-Sketch Tx
Using teaching strategies of:
1. Pictography
2. Bulleted notes
3. Oral practice
To improve comprehension & expression of challenging expository texts
Why The Tx Benefit? 
**Simplicity and Quick & Easy Visuals**

- It isn't complicated. Students appeared to quickly grasp how the process worked. This seems crucial to the idea of carry over. If they are going to be using this strategy on their own, it has to be simple enough to remember and not require significant materials
- With the focus on 'quick and easy, just enough to remember,' many of my students who typically lose focus were more able to come up with a picture or a few words to use for their notes
- Pictography strategy helped kids remember the meanings of words such as "nocturnal" and "amphibian"

Why The Benefit? 
**Repetition & Ownership**

- Once a well-formed sentence was established, the student took ownership of the sentence and successfully implemented these complete sentences in well-formed oral reports.
- The repeated oral practice appeared to build confidence. When initially starting the study, the students were overwhelmed by the length and complexity of the articles.
  With the repetition and strategies, by the third article, each student was eager to not only tackle the article and learn about the interesting animal, they also immediately identified details with more independence and overall confidence.

Why the Benefit? 
**Oral Practice**

- The benefit of the student's continued repeated practice of complete sentences was eye opening…The more practice they received, the more complex their sentences appeared to become.
- The oral practice phase. A concept I grasped well for younger learners… I was failing to understand how this concept looked for older students. The oral practice piece of this intervention was the answer and it makes so much sense.
- Having the student practice the full sentence until a good grammatical sentence was achieved…it paid off for the students when giving the full report.

Why the Benefit? 
**Connecting to the Classroom**

- Bridge some gaps between the tx setting and actual classroom skills and assignments...potential to positively change my delivery of services for the intermediate population
- Collaborating with teachers about an upcoming project, using the classroom resources in therapy, and using this strategy to create the finished project would be incredibly helpful and successful

Exploration & Implementation in a School Setting

- Non-study participants
- Teacher reactions
- Principal reaction
  + Case study on tx & dx modifications
    - Extend tx length
    - Scaffold habits of note-taking & verbal rehearsal
    - Refine testing procedures

Exploration & Implementation in a University Setting

- Evidence-based treatment
- SLP supervisor & grad students
- Wide age range
- Extended and modified
- Maintain critical elements
  - 3 strategies
  - RISE+
A Study SLP’s View: Oral Tx → Written Product

So many of our students are reluctant writers. Before understanding how this process worked, I was leery that I would be attempting to be the ‘writing teacher’, which is an area where I am uncomfortable.

However, I was pleasantly surprised to discover that the writing aspect of this process was not the main focus. In fact, the final writing project flowed very smoothly from the previous steps. It wasn’t an additional, huge writing assignment to tackle, but a finished product that flowed naturally from the notes and oral practice stages.

References
Boyle, J.R. et al. (2014). Note-taking training to assist students with disabilities in content area classes. Preventing Scht Failure, 59, 186-195.

Utah State University

$20K/year • Full tuition • Four years
Doctoral Leadership Program in Implementation Science
comd.usu.edu/programs/graduate/slp