



Supporting Teachers' Use of Data to Improve Children's Early Writing Outcomes

Minnesota Administrators for Special Education
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Presentation Overview

- Overview of The Early Writing Project
- Practical applications
- Pilot study methods & results
- Discussion; directions for further research & practice



Why early writing?

- Many children struggle to learn to write
- About 20% of 8th- and 12-graders perform below a basic level in writing*
- Some struggling writers benefit from research-based interventions
- Some will require more intensive, individualized intervention



*(http://www.nationsreportcard.gov/writing_2011/summary.aspx)

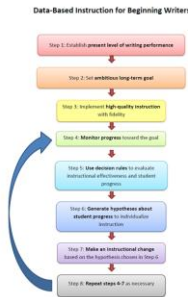


What is Data-Based Instruction (DBI)?

A framework for delivering intensive, individualized intervention.

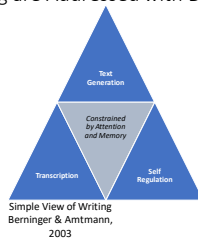
Teachers follow 8 steps:

1. Establish present level of performance
2. Set long-term goal
3. Implement high-quality instruction
4. Monitor progress
5. Evaluate the effects of instruction
6. Generate hypotheses
7. Make instructional changes
8. Repeat 4-7



What Components of Writing are Addressed with DBI?

- **Text generation**
 - Turning ideas into text (words, sentences, passages)
 - Includes idea generation, word choice, content, text structure, genre
- **Transcription**
 - Translating sounds, words, sentences, and passages into print
 - Includes handwriting or typing, spelling, and mechanics
- **Self-regulation**
 - What writers do to meet their writing goals
 - Includes goal setting, planning, organizing, self-monitoring, self-evaluating, revising, and self-rewarding



What is DBI-TLC?

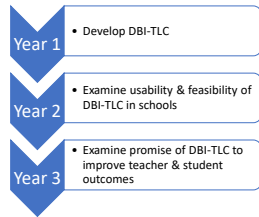
- A *professional development system* for teachers that provides:
 - Tools (*assessment tools, intervention plans, materials*)
 - Learning (*face-to-face workshops*)
 - Collaborative support (*ongoing coaching*)



Purpose of 3-year project

Develop DBI-TLC

- To support teachers' use of Data-Based Instruction (DBI)
- To improve early writing outcomes for students at risk or with disabilities

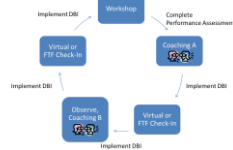


What we developed

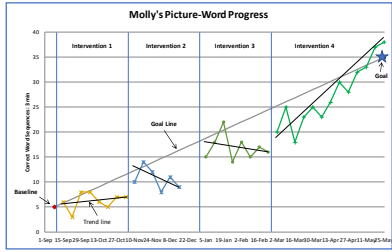
DBI process and tools



Learning & coaching cycle



DBI Process: Meet "Molly"



The Early Writing Project
DATA BASED INSTRUCTION: TOOLS, LEARNING, AND COACHING

Our materials...

- Curriculum-based measures in early writing
 - Word Dictation
 - Picture Word
 - Story Prompts
- Diagnostic checklists
 - To identify specific skill needs
- Intervention mini lessons
 - Research based lessons that align with specific early writing skills
- Decision making rubric

Please go to <http://dbitc.missouri.edu/> or <http://www.cehd.umn.edu/edpsych/dbi-ttc/> for more information.

The Early Writing Project
DATA BASED INSTRUCTION: TOOLS, LEARNING, AND COACHING

CBM Tools

Task	Level of Language	Grade Level	Scoring Method
Word Dictation	Word	1, 2, 3	Words Written (WW) Words Spelled Correctly (WSC) Correct Letter Sequences (CLS)
Picture-Word	Sentence	1, 2, 3	WW WSC Correct Word Sequences (CWS)
Story Prompt	Passage	2, 3	WW WSC CWS

CBM Tools

The image shows three overlapping sample pages for CBM Tools. The leftmost page is titled 'Word Dictation' and contains a list of words for dictation. The middle page is titled 'Picture Word' and features a small illustration of a mouse with the word 'mouse' written below it. The rightmost page is titled 'Story Prompt' and contains a short story prompt: 'One day, we were playing outside the school and...' followed by several lines of blank space for writing.

Would this come from your student?

This section shows three examples of student handwriting on lined paper. Each example includes a small illustration and a handwritten sentence. The first example shows a drawing of a mouse and the sentence 'I had a nice so much I want to be a mouse'. The second example shows a drawing of a sun and the sentence 'The sun is shining bright'. The third example shows a drawing of a baseball cap and the sentence 'I have a nice ball cap'. The handwriting is somewhat messy and shows signs of being written by a young child.

Have you done the third one lately?

This section shows three examples of student handwriting on lined paper. Each example includes a small illustration and a handwritten sentence. The first example shows a drawing of a child playing and the sentence 'Let's play play ball paper'. The second example shows a drawing of a fish and the sentence 'I have a fish'. The third example shows a drawing of a flower and the sentence 'Stop and smell the flowers'. The handwriting is somewhat messy and shows signs of being written by a young child.

Following CBM screening...Diagnostic Checklist

Diagnostic Checklists		
Transcription		
Process <i>Observe your student during the writing process</i>	Product <i>Examine your student's writing sample</i>	Matched Interventions <i>Select interventions that align with your student's writing skill.</i>
Handwriting <i>Show the student:</i> <ul style="list-style-type: none"> How the pencil or pen is held? How the paper is held? How the student sets up their writing area? How the student sets up their writing surface? How the student sets up their writing posture? How the student sets up their writing materials? How the student sets up their writing environment? How the student sets up their writing posture? How the student sets up their writing materials? How the student sets up their writing environment? 	Handwriting <i>Show the student:</i> <ul style="list-style-type: none"> How the student sets up their writing area? How the student sets up their writing surface? How the student sets up their writing posture? How the student sets up their writing materials? How the student sets up their writing environment? How the student sets up their writing posture? How the student sets up their writing materials? How the student sets up their writing environment? 	Handwriting <ul style="list-style-type: none"> Match-interventions: Phonics: Phonics Match-interventions: Phonics: Phonics Match-interventions: Phonics: Phonics Match-interventions: Phonics: Phonics Match-interventions: Phonics: Phonics Match-interventions: Phonics: Phonics Match-interventions: Phonics: Phonics Match-interventions: Phonics: Phonics
Spelling <i>Show the student:</i> <ul style="list-style-type: none"> How the student sets up their writing area? How the student sets up their writing surface? How the student sets up their writing posture? How the student sets up their writing materials? How the student sets up their writing environment? How the student sets up their writing posture? How the student sets up their writing materials? How the student sets up their writing environment? 	Spelling <ul style="list-style-type: none"> Match-interventions: Phonics: Phonics Match-interventions: Phonics: Phonics Match-interventions: Phonics: Phonics Match-interventions: Phonics: Phonics Match-interventions: Phonics: Phonics Match-interventions: Phonics: Phonics Match-interventions: Phonics: Phonics Match-interventions: Phonics: Phonics 	Spelling <ul style="list-style-type: none"> Match-interventions: Phonics: Phonics Match-interventions: Phonics: Phonics Match-interventions: Phonics: Phonics Match-interventions: Phonics: Phonics Match-interventions: Phonics: Phonics Match-interventions: Phonics: Phonics Match-interventions: Phonics: Phonics Match-interventions: Phonics: Phonics

One of Molly's CBM Baseline Prompts

mouse

sun

cap

Handwriting: Does Molly...

- Can the student write all letters...?
- in upper and lower case legibly?
- in the correct direction?
- using smooth strokes?
- in a regular size (not too large, not too small)?
- with proper slant?
- with correct spacing between letters and words?
- evenly on lines?

So, Molly appears to have relative strengths in handwriting.



DATA-BASED INSTRUCTION: TOOLS, LEARNING, AND COACHING

Spelling: Does Molly...

- Does the student...**
- ? recognize and write both of the vowel consonants (e.g. fog and bold)?
 - ✗ correctly spell words with these vowel consonants (e.g. gate and black)?
 - ✓ recognize and write consonant digraphs (e.g. rough and above)?
 - ? correctly write double letters in multisyllabic words with short vowels (e.g. rabbit and haggard)?
- Select letters:** Does the student...
- ? write silent letters correctly (e.g. know and climb)?
- Long vowels:** Does the student...
- ✗ write long vowel sounds correctly in a variety of ways (e.g. with final e, ian, vowel teams: egg and again, with -igh, -il, -oi, -igh, -igh, -igh with -y, -ay)?
- Multisyllabic words, suffixes:** Does the student...
- ✓ include a vowel in each syllable of multisyllabic words?
 - ✓ follow order for adding suffixes to root words (e.g. "beautiful" rather than "beautifl")?

So, Molly appears to have a mix of strengths and weaknesses in spelling, but I need to know more...



DATA BASED INSTRUCTION, TOOLS, LEARNING, AND COACHING

Diagnostic Example: Words Their Way Spelling Inventory

SPELLING STAGES	EMERGENT				LETTER-NAME CORRELATION				SOUND-BLENDS				SYLLABLES AND ONSETS				SOUND-RELATIONS				Word Family Count
	LA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA		
1.1.1	

Text Generation: Does Molly...

- Does the student...**
- ✗ use correct punctuation and capitalization?
 - ✗ use correct parts of speech (nouns, adjectives, determiners, prepositions)?
 - ✗ produce simple and compound sentences?
 - ? produce the expected amount of text compared to peers? (K)
 - ? use varied vocabulary? (K)

So, Molly appears to have a mix of strengths and weaknesses in text generation, but I need to know more...

Diagnostic Example: Beginning Writers Continuum (from 6+1 Traits)

EMERGING	DEVELOPING	CAPABLE
WORD CHOICE — Recognizable words — Environmental words used correctly — Attempts at phrases — Functional language SENTENCE FLUENCY — Strings words together into phrases — Attempts simple sentences — Short, repetitive sentence patterns — Dialogue present but not understandable	WORD CHOICE — General or ordinary words — Attempts new words but they don't always fit — Suffixes for the word or phrase that "feel off" — Big words used only to impress reader — Relies on slang, cliches, or repetition SENTENCE FLUENCY — Uses simple sentences — Sentences tend to begin the same — Experiments with other sentence patterns — Reader may have to reread to follow the meaning — Dialogue present but needs reorganization	WORD CHOICE — Uses specific words correctly — Experiments with new and different words with some success — Tries to choose words for specificity — Attempts to use descriptive words to create images SENTENCE FLUENCY — Simple and compound sentences present and effective — Attempts complex sentences — Not all sentences begin the same — Sections of writing have rhythm and flow

Step 3a: Identify Research-Based Instructional Methods



How does Mrs. Lewis decide what to do?

- After considering Molly's strengths and weaknesses, she decides to focus her instruction on
 - Spelling words with long vowels and consonant blends
 - Sentence construction (using caps and punctuation)
 - Sentence combining (to make more complex sentences)

Step 3a: Identify Research-Based Instructional Methods



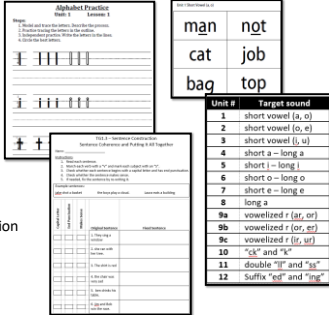
Matching an Intervention to Student's Needs

Process	Products	Matched Interventions
<i>Does your reader bring to writing process?</i> For the reader: <ul style="list-style-type: none"> □ provide ideas that are appropriate to the assignment? □ make a plan to organize his/her ideas (e.g., brainstorming, using graphic organizers, outlining)? □ produce text directly related to the writing and response criteria, covering all, including or "filling up" pages? □ write his/her message? 	<i>Does your reader bring enough from CEM or other assignments?</i> For the reader: <ul style="list-style-type: none"> □ use correct punctuation and capitalization? □ use correct parts of speech (noun, verb, adjective, demonstrator, preposition)? □ produce simple and compound sentences? □ produce the expected number of text (compared to peer)? □ use read materials? □ Produce text in the appropriate genre (e.g., story, response form, letter, etc., essay, etc.) □ organize the text appropriately (e.g., paragraphs, title, heading, etc.)? 	<i>Does intervention fit along with student's writing and?</i> <ul style="list-style-type: none"> ○ Max/Genius TQ1 - Performance Coach/Gen ○ Max/Genius TQ2 - Beyond Writing Coach/Gen ○ Max/Genius TQ3 - Sentence Combining Coach/Gen ○ TQ4 - Transcription + Text Generation

Step 3a: Identify Research-Based Instructional Methods

Intervention Tools



- Mini-Lessons in:
- Transcription
 - TR1: Phonics Warm-Up
 - TR2: Alphabet Practice
 - TR3: Word Building
 - TR4: Wordy Study
 - TR5: Alphabet Rockets
 - TR6: Word Sort
- Text Generation
 - TG1.1-1.3: Sentence Construction
 - TG2: Sentence Combining
 - TG3: Repeated Writing
 - TG4: Writing Goals
 - TG5: Writing

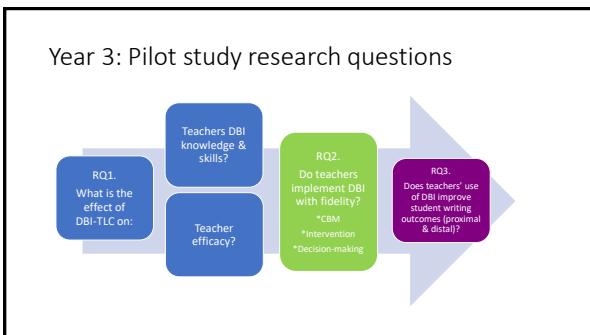


Intervention Tools

- Word Building Mini-Lesson

https://www.youtube.com/watch?v=2aVz_7_1bGk&feature=youtu.be



Method

Setting & Participants

- Two Midwestern districts
 - 1 large urban and 1 mid-sized city with diverse student populations
- Participants:
 - 20 special education teachers primarily serving children in Grades 1-3 (randomly assigned to DBI or Control)
 - 57 children with a range of mild-moderate disabilities and significant early writing needs



Participant demographics: Teachers

	DBI	Control	χ^2 (p-value)
Gender			n/a
Female	11 (100%)	10 (100%)	
Male	-	-	
Ethnicity			2.43 (.296)
Asian American/Pacific Islander	-	-	
Black/African American	-	1 (10%)	
Hispanic/Latino(a) American	-	1 (10%)	
White/European American	11 (100%)	8 (80%)	
Age			1.78 (.620)
20-29	2 (18.18%)	3 (30%)	
30-39	3 (27.27%)	3 (30%)	
40-49	5 (45.45%)	2 (20%)	
50-59	1 (9.09%)	2 (20%)	
Highest Degree			.76 (.683)
Bachelor's	4 (36.36%)	4 (40%)	
Master's	3 (27.27%)	4 (40%)	
Master's + Coursework	4 (36.36%)	2 (20%)	



Picture

Picture-Word (sentence level)

Simple View of Writing: Assessment

Story Prompt (passage level)

Measures (fidelity)

- Accuracy of Implementation Rating Scales^a
 - CBM administration; reliability of scoring
 - Writing intervention fidelity
 - Timely and appropriate decision-making (using student graphs and decision logs)

^aAdapted from Fuchs, L. S., Davis, S. L., & Mirkin, P. K. (2004). The effects of frequent curriculum-based measurement and evaluation on pedagogy, student achievement, and student awareness of learning. *American Educational Research Journal*, 21(2), 449-460.

The Early Writing Project
DATA-BASED INSTRUCTION, TOOL LEARNING, AND COACHING

Procedures

Beginning of study:

- Training of GRAs/Coaches
- Teacher pre-tests (Knowledge and Skills, Efficacy)
- Learning Modules 1 & 2
- Student pre-tests (CBM & TEWL-3)

Throughout study:

- Cycle of DBI with coaching and Learning Modules 2 & 3
- AIRS-CBM and Writing Intervention observations
- Control observations

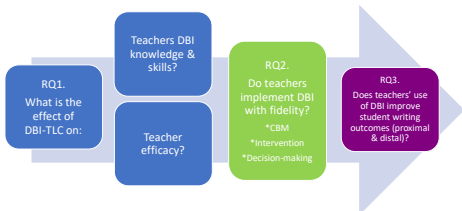
End of study:

- Teacher & student posttests
- Focus groups & survey
- DBI workshops for control teachers

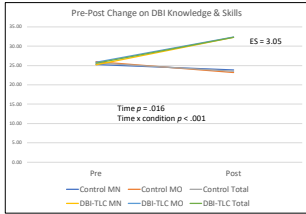


Results

Year 3 Research Questions

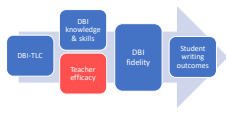
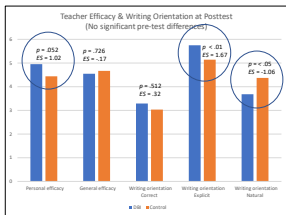


What is the effect of DBI-TLC on teachers' knowledge & skills?



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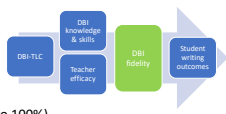
What is the effect of DBI-TLC on teacher efficacy?



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DATA BASED INSTRUCTION, TOOLS, LEARNING, AND COACHING

Do teachers implement DBI with fidelity?

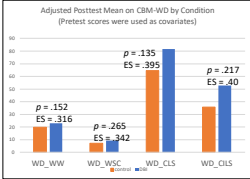
- **CBM**
 - Administration: 83% accuracy (range = 69% to 100%)
 - Scoring reliability: 95%
- **Writing Intervention**
 - Fidelity: 79% accuracy (range = 40% to 94%)
- **Data-based decision making**
 - Timely & appropriate decision making: 52% accuracy (range = 0% to 88%)



What is the effect of DBI-TLC on student writing outcomes?

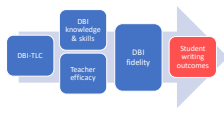


Proximal CBM: Word Dictation (WD)

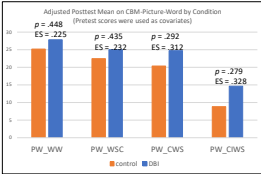


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What is the effect of DBI-TLC on student writing outcomes?

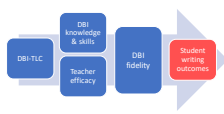


Proximal CBM: Picture-Word (PW)

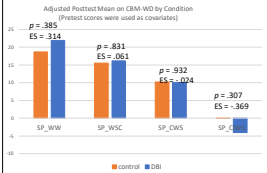


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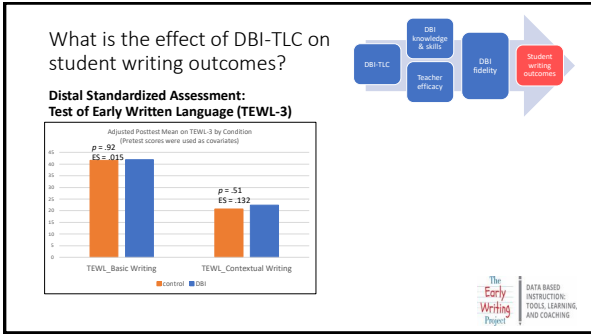
What is the effect of DBI-TLC on student writing outcomes?



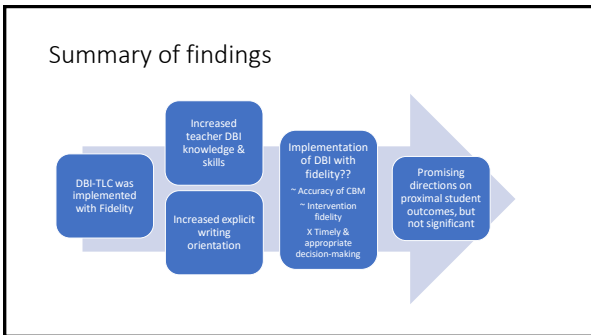
Distal CBM: Story Prompt (SP)



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Discussion



Directions for research

- Further work needed to determine how to support teachers' implementation of DBI with fidelity
 - Ways to improve PD?
 - Ways to improve ongoing support?
 - External conditions that need to be in place?
 - Need for a specific focus on data-based decision-making



Implications for practice...

Teachers found DBI to be usable & feasible:

- It became easier to implement over time
- They valued the tools (assessments & interventions) and data
- Learning modules and coaching were supports
- We modified the tools based on their feedback



Implications for practice

- Teachers can improve their DBI knowledge and skills through professional development & support
- Teachers report that CBM-W data are valuable
- Teachers feel that the intervention materials prompt student engagement within their small groups
- What would be strengths and barriers of implementation for you in your school or classroom?
- How could you support implementation for novice users?



From a teacher's point of view...

The thing I really like about DBI is that I am the researcher. I can come to an IEP meeting and show the team, especially the parent, that the student is making progress with this intervention at this time. I like DBI because it helps me improve my practice. Instead of asking "What is wrong with the student?" I ask "What is it that I need to change, so that this student can make progress?"

~Annamary Boler, MPS



Interested in Participating in Research?

- UMN was awarded \$3,330,000 from US Dept of Ed to examine the efficacy of Data-Based Instruction in Early Writing:
 - A professional development system designed to support teachers' use of data-based instruction to identify student writing needs, customize instruction, and monitor progress.
 - Preliminary findings suggest that teachers gain knowledge and skills in data-based instruction and their students showed higher writing outcomes, compared to a control group.
 - We currently accepting new teacher participants for 2018-19.
- Contact:
 - Kristen McMaster (Principal Investigator) at mcmas004@umn.edu or 612-624-1859
 - Elizabeth Lam (Project Director) at elam@umn.edu or 612-624-7396
- Visit <http://innovation.umn.edu/early-writing/>