Working With Evidence: What Does it Mean for Literacy Instruction?

Presented to the Minnesota Center for Reading Research
Summer Literacy Workshop

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A presentation in two parts:

Part 1 (a.m.)
Evidence for Practice: Informing High-Quality Literacy Instruction

Part 2 (p.m.)
Evidence IN Practice: Conducting High-Quality Literacy Instruction

with
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Evidence for Practice:
Informing High-Quality Literacy Instruction
Working with evidence: What does it mean to you?

What evidence do you work with? Why?
“...practices or programs that have evidence to show that they are effective at producing results and improving outcomes when implemented”

(Every Student Succeeds Act; https://www.cde.ca.gov/re/es/evidence.asp)

**Strong Evidence**: ≥ 1 well-designed, well-implemented randomized control experimental studies.

**Moderate Evidence**: ≥ 1 well-designed and well-implemented quasi-experimental studies.

**Promising Evidence**: ≥ 1 well-designed and well-implemented correlational studies.

What does ‘evidence-based practice’ mean?
Evidence **collected in research** – generalizable outcomes from “well designed, well implemented” studies showing what works, for whom, and under what conditions.

Evidence **collected in practice** – particular data showing whether a practice works for specific students in a specific context.

Two broad kinds of evidence that can inform practice.
Why does it matter?

- Nation's Report Card in Reading

<table>
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<th>below Basic</th>
<th>Basic</th>
<th>Proficient</th>
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<td>34*</td>
<td>25*</td>
<td>8*</td>
</tr>
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</table>
Why does it matter?

- Nation's Report Card in Writing

 Students who struggle to reach proficiency in literacy are likely to struggle throughout their education and employment (Snow, 2002)
Why does it matter?

MN ACHIEVEMENT GAP: READING MCA
(SCORES COMPARED TO AVERAGE)

We can’t afford to base literacy instruction on hunches, guesses, anecdotes, and feelings – or even what commercial curriculum publishers tell us.

Rather, we must look at, evaluate, and use evidence to make instructional decisions.
Evidence collected in research – generalizable outcomes from “well designed, well implemented” studies showing what works, for whom, and under what conditions

How do we build a strong evidence base for practice?
“There’s nothing so practical as good theory.” ~ Kurt Lewin (social psychologist)

“In god we trust, others must provide data.” ~ Edwin R. Fisher (Professor of Pathology)

“Always design a thing by considering it in its next larger context – a chair in a room, a room in a house, a house in an environment....” ~ Eliel Saarinen (Finnish architect)
Context matters
Two lines of research

Technology-based early language comprehension instruction & intervention

Supporting teachers’ use of data to improve early writing outcomes

The Early Writing Project
PI: Panayiota (Pani) Kendeou

The research reported here is supported by the Institute of Education Sciences, U.S. Department of Education, through Grant R324A160064 to the Regents of the University of Minnesota.
Designed to improve reading comprehension by developing inference making for struggling readers in Grades 1-2. It is an interactive, software application with 24 modules, which engage students to:

- Learn key academic vocabulary words
- View age-appropriate videos (12 fiction, 12 nonfiction)
- Respond to inferential questions
- Receive scaffolding and feedback for each question
- Receive small-group transfer lessons
Building an evidence base for TeLCI

Inferencing is the cornerstone of reading comprehension (McNamara & Magliano, 2009)

Requires activation and integration of information

Can be prompted with questioning, scaffolding, and feedback
Building an evidence base for TeLCI

Inferencing develops independently of decoding skill
(Kendeou et al., 2008)

It can be taught even while children are still learning to read

We can leverage technology to support inference making
Nonfiction Example

Watch for:

vocabulary, questions, scaffolding, & feedback
Building an evidence base for TeLCl

- Three-year development project to examine the *usability, feasibility, and promise* of TeLCl
- Culminated in a small randomized control trial
**Eligible**: n = 124

**CELF-USP** < 8

**Teacher Training**: n = 11

**Control**: n = 60

**8 weeks of intervention**: 4x 25 min

**Control**: 8 weeks of BAU instruction

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**MIA – Proximal**

Fidelity Observations 74.5%

**MIA – Proximal**

CELF – USP

CELF – WC

Early Reading

GMRT

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**CELF – USP**

Mean age = 6.97

50% Female

48% Hispanic

17% Special Ed

46% ELL

77% FRL

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Kendeou, McMaster, & the TeLCI Team, 2019
Student responses to questions during intervention

TeLCI Yr3 Scores without Scaffolding

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<th>STEM</th>
<th>Centennial</th>
<th>Overall</th>
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<tr>
<td>Time4</td>
<td>50.4</td>
<td>55.5</td>
<td>53.44</td>
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TeLCI Yr3 Scores with Scaffolding

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<th>Overall</th>
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<tr>
<td>Time4</td>
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<td>80.09</td>
<td>77.69</td>
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Kendeou, McMaster, & the TeLCI Team, 2019
Student response to intervention overall

Proximal measure (closely tied to intervention)

Distal measure (standardized test of language comprehension)
Many students benefit from high-quality, evidence-based instruction.

Yet, a small number do not, and require more intensive, individualized instruction.
Evidence **collected in practice** – particular data showing whether a practice works for specific students in a specific context

How do we build a strong evidence base for practice?
The Early Writing Project

Data Based Instruction: Tools, Learning, and Coaching

Co-PI: Erica Lembke, University of Missouri, Columbia

The research reported here is supported by the Institute of Education Sciences, U.S. Department of Education, through Grants R324A130144 and R324A160064 to the Regents of the University of Minnesota.
Supporting teachers' use of data (evidence!) to improve early writing outcomes

**Data-based instruction (DBI)** can improve outcomes for students with the most intensive academic needs

DBI is a systematic, data-based approach for teachers to individualize instruction for beginning writers.
Data-Based Instruction

Is...

- A framework for making instructional decisions
- A dynamic process of ongoing assessment and intervention

Is not...

- A curriculum
- An assessment
- A single intervention
Data-Based Instruction: Assumptions

To provide effective individualized instruction, educators should implement instructional approaches that are **evidence-based** (see ESSA definition!).
Data-Based Instruction: Assumptions

BUT, it is **impossible to predict** whether these approaches will meet the unique needs of each individual student.
Data-Based Instruction: Assumptions

We can only *hypothesize* that a given instructional approach will work for an individual student; thus, *we must test* whether it is effective for that student.
Data-Based Instruction: Assumptions

We can collect ongoing *assessment data* and use it as *evidence* to determine whether an instructional approach is working for an individual student.
DBI Steps

1. Establish **present level of writing performance**
2. Set **ambitious long-term goal**
3. Implement **high-quality instruction** with fidelity
4. **Monitor progress** toward the goal
5. Use **decision rules** to evaluate instructional effectiveness and student progress
6. **Generate hypothesis about student progress** to individualize instruction
7. **Make an instructional change** based on hypothesis chosen in step 6
8. **Repeat steps 4-7** as necessary
Case Example:

Mrs. Lewis & Molly
Step 1: Establish current level of writing performance (baseline).
Sample Picture Word Prompt

Form 1

wash

school

mouse

Copyright 2016, McMaster & Lembke
Step 2: Set an ambitious long-term goal.
Step 3: Implement high quality instruction with fidelity based on student needs.
Writing Instructional Plan

- **Activity:** Practice, Mini-lesson, Group Work
- **Time:** 20 min
- **Objective:** Teach students to read the words.
- **Materials:** PowerPoint, Handouts

**Thursday:**
- **Activity:** Practice, Review
- **Time:** 20 min
- **Objective:** Review the words and prepare for the next lesson.
- **Materials:** PowerPoint, Handouts

**Friday:**
- **Activity:** Practice, Mini-lesson
- **Time:** 20 min
- **Objective:** Teach students to read the words.
- **Materials:** PowerPoint, Handouts

**Writing Instructional Plan (WIP): Transcriptive Sample**

**Lesson 1:**
- **Objective:** Teach students to write a simple sentence.
- **Activity:** Mini-lesson
- **Time:** 20 min
- **Materials:** Handouts, PowerPoint

**Lesson 2:**
- **Objective:** Practice writing sentences.
- **Activity:** Group Work
- **Time:** 20 min
- **Materials:** Handouts, PowerPoint

**Lesson 3:**
- **Objective:** Review writing skills.
- **Activity:** Mini-lesson
- **Time:** 20 min
- **Materials:** Handouts, PowerPoint

**Lesson 4:**
- **Objective:** Teach students to write a simple paragraph.
- **Activity:** Group Work
- **Time:** 20 min
- **Materials:** Handouts, PowerPoint

**Lesson 5:**
- **Objective:** Review writing skills.
- **Activity:** Mini-lesson
- **Time:** 20 min
- **Materials:** Handouts, PowerPoint

**Lesson 6:**
- **Objective:** Teach students to write a complex paragraph.
- **Activity:** Group Work
- **Time:** 20 min
- **Materials:** Handouts, PowerPoint

**Lesson 7:**
- **Objective:** Review writing skills.
- **Activity:** Mini-lesson
- **Time:** 20 min
- **Materials:** Handouts, PowerPoint

**Lesson 8:**
- **Objective:** Teach students to write a research paper.
- **Activity:** Group Work
- **Time:** 20 min
- **Materials:** Handouts, PowerPoint

**Lesson 9:**
- **Objective:** Review writing skills.
- **Activity:** Mini-lesson
- **Time:** 20 min
- **Materials:** Handouts, PowerPoint

**Lesson 10:**
- **Objective:** Teach students to write a creative story.
- **Activity:** Group Work
- **Time:** 20 min
- **Materials:** Handouts, PowerPoint

**Lesson 11:**
- **Objective:** Review writing skills.
- **Activity:** Mini-lesson
- **Time:** 20 min
- **Materials:** Handouts, PowerPoint
Step 4: Monitor student progress toward the goal.
Step 5: Use decision rules to evaluate student progress & instructional effectiveness.
Decision-making rubric

Examine the trend line
Select one of three decisions:

- The trend line is steeper than the goal line
  - Increase the goal

- The trend line is even with the goal line
  - Continue as is

- The trend line is flatter than the goal line
  - Change instruction
Step 6: Generate hypotheses to individualize instruction.

Molly's Picture-Word Progress

Correct Word Sequences: 3 min

Baseline

Goal Line

Intervention 1

Goal

Trend line
Self-check questions

Were the early writing lessons delivered as intended?

1. Has the student participated in all planned writing lessons for each full session?
2. Have I implemented the intervention with fidelity (refer to mini-lesson fidelity checks)?

If answers to 1 AND 2 are yes:

- **Diagnostic questions**
  - Does the student need changes to the content of the intervention?
    - Use Instructional Alignment Tool and Diagnostic Checklist to assure that content is addressing student needs

If content area is appropriate then refer to intensification Guide on next page.

If content area is NOT appropriate, use Instructional Alignment Tool to align instruction.

If answer to 1 OR 2 is NO:

Refer to Fidelity Diagnostic Tool below for guiding questions to help make adjustments.
Step 7: Make instructional changes based on hypotheses.
Step 8: Repeat the process!
What is the Early Writing Project?

• We provide:
  • **Tools** (assessments, evidence-based mini-lessons & materials, decision-making tools)
  • **Learning modules** (face-to-face workshops on how to use data to individualize instruction)
  • **Coaching** (ongoing, personalized support)
Theory of Change

Building an evidence base

Providing PD in DBI improves...

Teachers’ DBI knowledge & skills

Teachers’ self-efficacy

Teachers’ fidelity of:
  * Assessment
  * Intervention
  * Decision-making

Student Early Writing Outcomes

Theory of Change
Pilot Study: 2015-16

Minnesota & Missouri

Teachers ($n = 20$)
Students ($n = 57$)

DBI-TLC

Control

Pre-test

Business as usual

Post-test

September

October - March

March

June
Teachers’ DBI Knowledge and Skills

Theory of Change

Pre-Post Change on DBI Knowledge & Skills

Time $p = .016$

ES = 3.05
Teacher Efficacy & Writing Orientation at Posttest
(No significant pre-test differences)

- **Personal efficacy**: $p = .052$, $ES = 1.02$
- **General efficacy**: $p = .726$, $ES = -.17$
- **Writing orientation Correct**: $p = .512$, $ES = .32$
- **Writing orientation Explicit**: $p < .01$, $ES = 1.67$
- **Writing orientation Natural**: $p < .05$, $ES = -.106$

**Theory of Change**
Fidelity of Implementation

• CBM Administration: 83% accuracy
• Writing Intervention: 79% accuracy
• Data-based decision making: 52% accuracy
Teachers’ DBI Knowledge and Skills

Theory of Change

Students’ early writing outcomes

Teachers’ Self-Efficacy

Teachers’ Fidelity to DBI

Adjusted Posttest Mean on CBM-Picture-Word by Condition
(Pretest scores were used as covariates)

- PW_WW: p = .448, ES = .225
- PW_WSC: p = .435, ES = .232
- PW_CWS: p = .292, ES = .312
- PW_CIWS: p = .279, ES = .328

control

DBI
Current Large-Scale Efficacy Study: 2018-21

Minnesota & Missouri
3 teacher/student cohorts across 3 years
Evidence **collected in research** – generalizable outcomes from “well designed, well implemented” studies showing what works, for whom, and under what conditions.

Evidence **collected in practice** – particular data showing whether a practice works for specific students in a specific context.

Two broad kinds of evidence that can inform practice.
What about context?
Stay Tuned for Part 2!

Evidence IN Practice: Conducting High-Quality Literacy Instruction

with

Marissa Strasziewski, Chris Rice, Samantha Shopbell, & Leah Swenson
Thank you!

Questions?