

Developing the Literacy Instruction Knowledge Scales (LIKs)



*A Comprehensive Assessment of Primary
Grade Teachers' Knowledge of Reading
and Writing Instruction*

*American Educational Research Association Meeting
Chicago, IL
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The Primary Grade Reading & Writing Teacher Knowledge Project



Purposes of the Project

- 1. Develop a comprehensive assessment of grade 1-3 teacher reading and writing instruction knowledge (inert and enacted).**
- 2. Conduct a validity study of this comprehensive assessment to predict grade 1-3 student reading and writing achievement.**



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Conceptualization

- **Began with Shulman's Theoretical Framework**
- **Evidence-based Framework**
 - **Exemplary Teacher Research**
 - **Evidence-based Research**
 - **Teacher Knowledge Measurement Research**
 - **Proxy measures**
 - **Direct measures**

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Measurement

- **Proxy Measures**
 - **Written Knowledge Tests or Surveys**
 - Content Knowledge
 - Pedagogical Knowledge
 - Content Pedagogical Knowledge
 - Standards/Curriculum
 - Assessment
 - **Direct Observation of Teacher Knowledge at Work**
 - Job analysis – What does it take to do this job?
 - What practices would we expect to see every day in primary grade classrooms based on research evidence that would impact student achievement?



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Evidence Based Knowledge Taxonomy Development

- **Literature Review**
- **Classroom Observations & Interviews**
- **Focus Group Meetings**
 - **Enumerative listing task**
 - **Included-term structure questions**
- **Expert Review of Taxonomy**
- **Data Audit Trail Verification**



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Evidence Based Knowledge Instrument Development

- **Two Subscales**
 - **Written Knowledge Survey**
 - **Classroom Teaching Observation**
- **Domain Specification**
 - **Decoding**
 - **Comprehension**
 - **Writing**
 - **Classroom Management**



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Evidence Based Knowledge Instrument Development

Iterative Cycle:

- **Write written knowledge items (inert knowledge)**
- **Develop classroom observation rubrics (enacted practice knowledge)**
- **Returned to written knowledge items to match with classroom observation rubrics (map onto enacted practice)**



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Evidence Based Classroom Observation LIKS Subscale

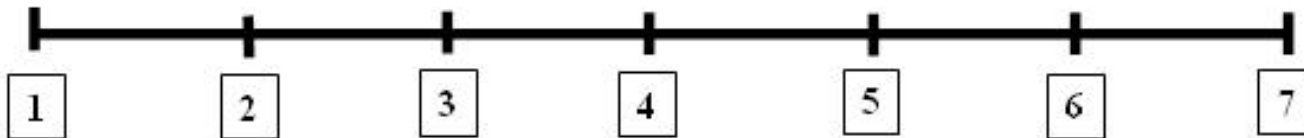
- **Evidence-Based Practices to be observed in Reading and Writing Instruction**
- **Scaling of the Instrument**
- **Writing Scaling Descriptors**
- **Pilot Try Outs**

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Example of Classroom Observation Subscale

Writing Continued O-W2—Guided Writing Practice



There is *no evidence* of teacher guidance and feedback during writing practice.

- No teacher guidance.
- No feedback.

There is *minimal evidence* of teacher guidance and feedback during writing practice.

- Teacher guides students to monitor task completion.
- Teacher provides feedback only regarding students' task completion.

There is *moderate evidence* of teacher guidance and feedback during writing practice.

- Teacher guides students to monitor task completion and understanding of writing tasks.
- Teacher feedback is limited to students' adherence to writing assignment requirements and mechanics.

There is *strong evidence* of teacher guidance and feedback during writing practice.

- Teacher guides students to monitor task completion and understanding of writing tasks and keeps a written record of their progress.
- Teacher feedback is specific and addresses both composing and mechanics.



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Evidence-Based LIKS Written Knowledge Survey

- **Item Sampling Table**
- **Item Writing Specifications**
- **Inert vs. Enacted Knowledge**



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Evidence-Based LIKS Written Knowledge Survey

- **Item development: Converging on the correct answer**
- **Cognitive Laboratories with Reading Coaches and Grade 1-3 Reading Teachers**
- **Revisions, Revisions, Revisions**
- **Tryout of 150 items with 500+ grade 1-3 teachers in randomly sampled elementary schools in 9 Utah school districts**



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Written Teacher Subscale Knowledge Try Out Results

Classical Testing Approach

- **Cronbach's Alpha was .816 for all 150 items in the pool.**



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Pedagogical Content Knowledge Items: Results of Initial Tryout

<u>Subscale</u>	<u>Number of Items</u>	<u>Current Reliability</u>
Decoding	30	.615
Comprehension	18	.426
Writing	21	.519



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Knowledge of Research-based Principles Items: Results of Initial Tryout

<u>Subscale</u>	<u>Number of Items</u>	<u>Current Reliability</u>
Decoding	14	.280
Comprehension	23	.494
Writing	4	.060



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Written Teacher Subscale Knowledge Try Out Results

- **Modern Testing Approach**
 - 1 Parameter IRT (Rasch Model)
 - 2 Parameter IRT
 - 3 Parameter IRT – insufficient sample size
 - Item Distracter Table Analyses
 - Confirmatory Factor Analyses

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Written Teacher Subscale Knowledge Try Out Results

- **Examples of Items that Did Function – Inert Teacher Knowledge**

89. Which is the distinguishing characteristic of phonemic awareness instruction?

A. uses printed letters	UPPER 14%	MID 25%	LOW 23%
B. uses two cueing systems	5%	15%	23%
C. does not use printed letters	61%	23%	18%
D. links sound to meaning	21%	37%	36%

Item-total correlation = .412

Discrimination Index = 47% (Upper-Low)

Difficulty Level = 34 % answered correctly



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Written Teacher Subscale Knowledge Try Out Results

- Examples of Items that Did Function – Enacted Knowledge

37. When selecting a text for comprehension instruction, which of the following would be the LEAST appropriate?

A. decodable text	UPPER 67%	MID 39%	LOW 33%
B. text from a basal	5%	6%	7%
C. picture book	17%	27%	25%
D. chapter book	12%	27%	25%

Item-total inter-correlation = .335

Discrimination Index = 34% (Upper – Low)

Difficulty Level = 47% answered correctly

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Written Teacher Subscale Knowledge Try Out Results

- Examples of Items that Did **Not** Functioned – Enacted Knowledge

35. Mrs. Newswander begins a writing lesson by creating with the student a web that contains the word, "said," surrounded by words like "shouted," "sulked," and "replied." She did this to teach students:

A. prewriting.	UPPER 30%	MID 32%	LOW 45%
B. drafting.	2%	10%	8%
C. revising.	68%	57%	45%
D. proofreading.	0%	0%	1%
E. publishing.	0%	1%	1%

Item-total inter-correlation = $-.03$

Discrimination Index = 23% (Upper – Low)

Difficulty Level = 57% answered correctly



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Written Teacher Subscale Knowledge Try Out Results

- Examples of Items that Did **Not** Function – Enacted Knowledge

71. Mrs. Murdock provides students daily, differentiated reading instruction in her first grade classroom. Which type of assessment will be most useful to inform Mrs. Murdock's on-going instruction?

A. diagnostic	UPPER 13%	MID 11%	LOW 8%
B. progress-monitoring	85%	84%	88%
C. screening	1%	1%	2%
D. outcomes	1%	4%	2%

Item-total correlation = $-.019$

Discrimination Index = -3% (Upper – Low)

Difficulty Level = 86% answered correctly



Developing the Literacy Instruction Knowledge Scales (LIKS)



Conclusions and Future Direction

- Completed year 2 of the LIKS project
- Designed two subscales to measure grade 1-3 teacher knowledge of reading and writing instruction
- Classroom Observation Subscale – Pilot stage with Dependability and Generalizability study to be conducted this coming year
- Written Knowledge Subscale – Pilot stage with further tryouts of items to be analyzed using IRT, CFA and Cronbach's Alpha
- Predictive validity study of LIKS with grade 1-3 student achievement in reading and writing



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