



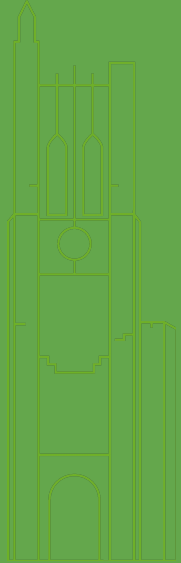
Reading
IS BREATHING IN

Writing
IS BREATHING OUT

Adrea
Truckenmiller,
PhD, NCSP

Associate Professor of
Special Education,
Michigan State
University

Presentation to AIM
Institute Symposium
2025



Team Science



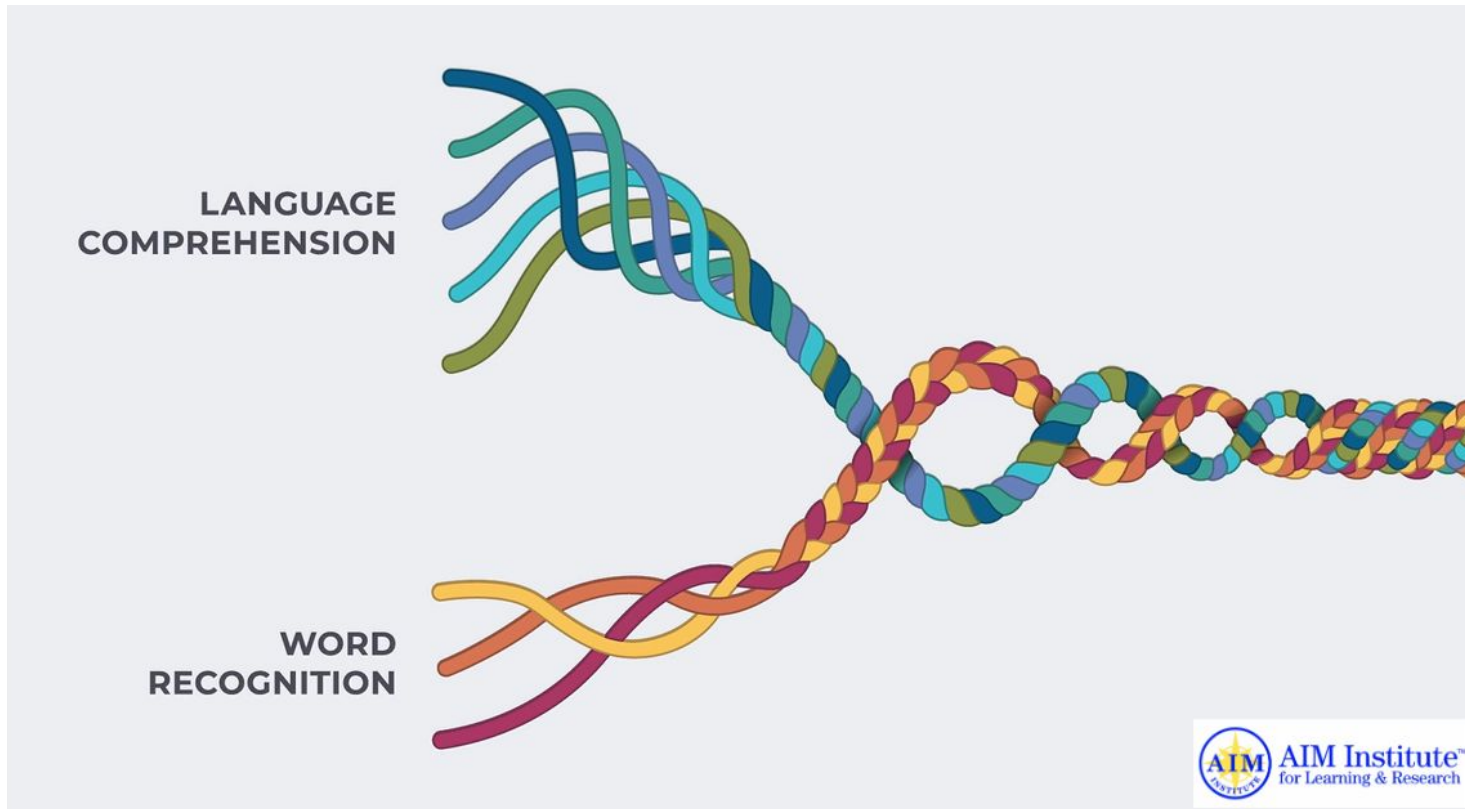
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OSEP grant #H325K200018



The opinions expressed are those of the authors and do not represent views of the Institute of Education Sciences or the U.S. Department of Education.



Bringing the rope to writing in classrooms

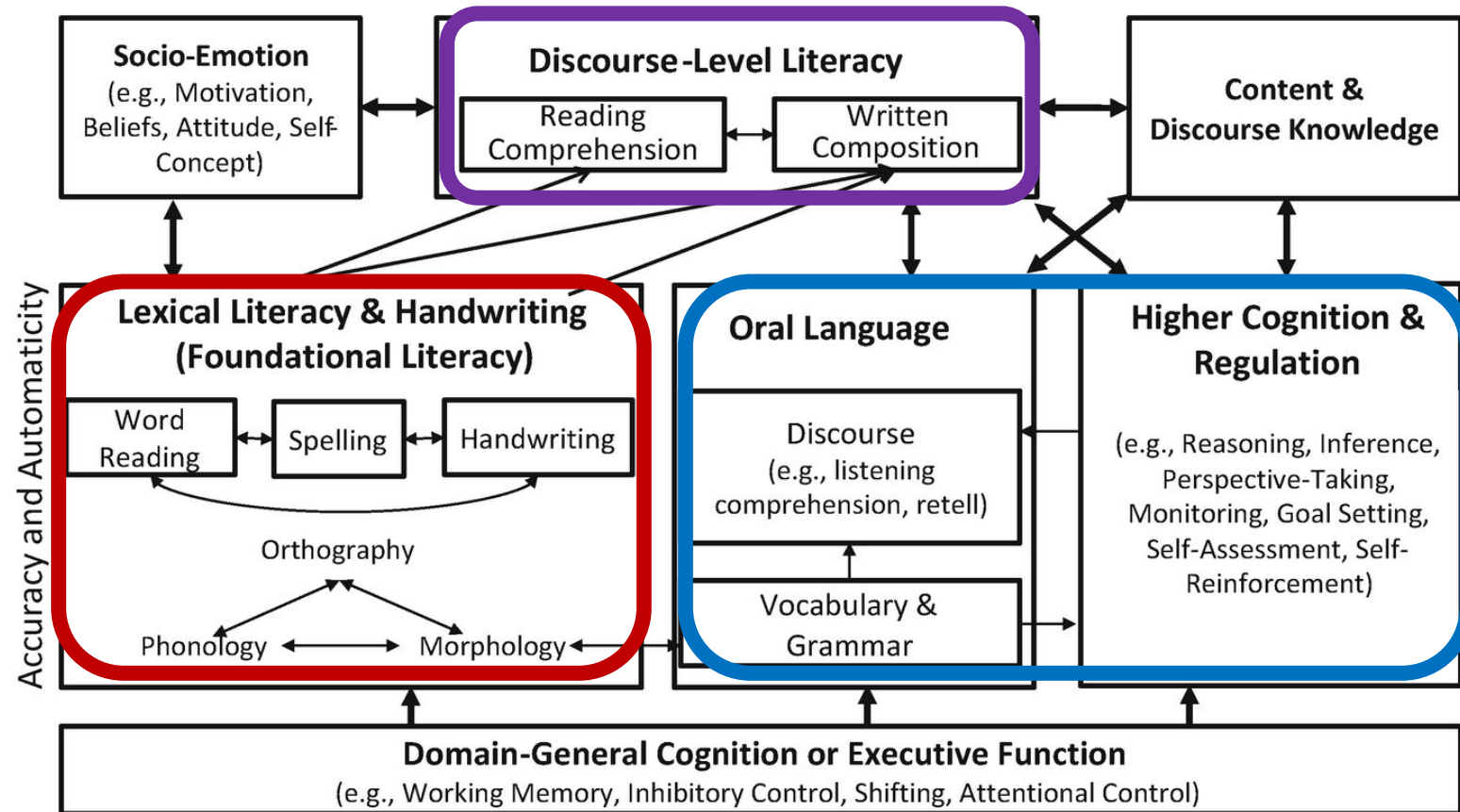


i stand
on the sacrifices
of a million women before me
thinking
what can i do
to make this mountain taller
so the women after me
can see farther

legacy - rupi kaur

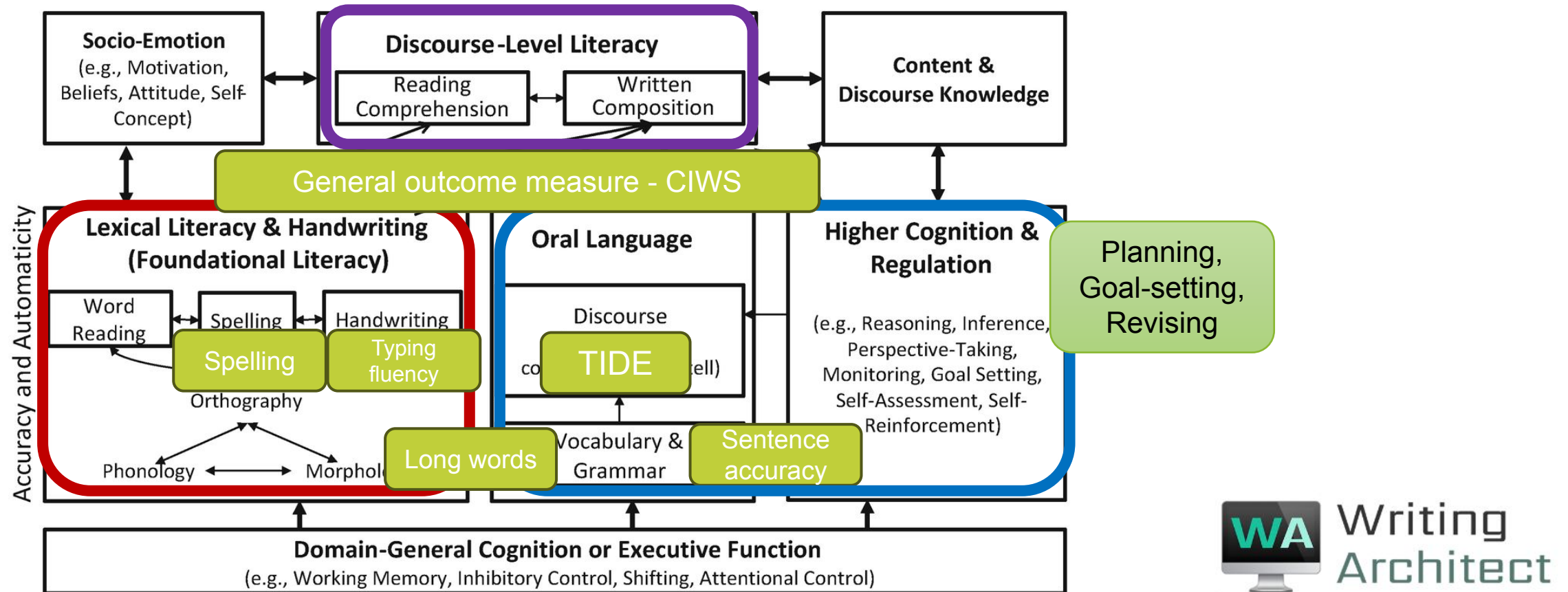


When Written Composition Breaks Down



Interactive Dynamic Literacy Model (Kim, 2020; Kim & Graham, 2022; Kim & Zagata, 2024)

When Written Composition Breaks Down



Interactive Dynamic Literacy Model (Kim, 2020; Kim & Graham, 2022; Kim & Zagata, 2024)

Visualizing the strands in students' writing

Revolutionizing writing scoring.

- Not AI
- Not a rubric
- Counting number of elements aligned to theory of development



the story i readed was the of the desert and i am going to tell you my point about this story.how they can live in the desert and i do not know how they live n the desert here my point cort-thik for heat bodytemperature-can change six degrees skin-thick and leathy that is my point on how the can live in the desert.

**Holistic
Score= 2**

Dear Lucas,

Since you live in the desert I thought that I should reccomend a camel as a pet for you. These animals can benifit your lifestyle in many ways. I think that you wold enjoy this animal and that it could help your everyday life

First of all, camels are called the "beasts of burden". These incredible animals can carry around one thousand pounds of cargo. "There is no other animal built to survive long periods of time like the camel". This talented and interesting animal could definetly help you up in the desert, especially when you need to travel with lots of cargo. Plus, as an edition if you have less cargo the camel moves faster! It could really impact your life!

More importantly,even on a bad day, this amazing animal can survive extreme weather! No need to provide it with tons of shelter! Saves you time and money!
sincerely

**Holistic
Score =
5**



MICHIGAN STATE UNIVERSITY

Student ID: 9999

First, you will hear a story and then you will write an article about the story you heard.

Listen and follow along on the page in front of you or on the computer screen as **Swat up: Six reasons to love flies** is read.

Click to hear the passage.



Swat up: Six reasons to love flies

Source: BBC Radio Natural Histories

They buzz and bother us but have also taught us so much about who we are. Here are six reasons to respect, if not love, the fly.

1. First creatures in space.

In February, 1947, American scientists launched a group of fruit flies into space.

The flies were sent 42 miles from Earth to study the effects of radiation at high altitude.

They were ejected in a container that parachuted to the ground. When they landed scientists found them to be in perfect health.

Fruit flies are still being sent into space to simulate the effects on astronauts. Fruit flies are chosen because humans and fruit flies are surprisingly similar.

2. Nature's detectives.

Flies help investigators establish the time of death of a body because the various stages of decomposition attract different insects at different times.

One classroom assessment to capture the high leverage strands

Writing Architect is a set of informational prompts for grades 3 through 8

Informational passage

(text differences accounts for 2% variance in student performance)

Text-based question

3 min planning time

Typed response

15 minutes to respond

Typing fluency activity



cheses sticks wich ae covered in plastick rap. wich are trown into land fills well that wont be for long. a girl named tomasula is trying to invenet a edeball plasick rapper. so it won't be trown into land fill.and another girl named laetitia bonnaillie joined the usda team they sugusted dairy dut soon found out that would be to much work puting on dair proten labbeils on the food so they tried carbien dinoxed soon they found out that they could make it choclett and strawbery flaved and soon the they had a metting with the usda team and said people would like to spray it on stuff like cearal so it wil still have that crunchthat is why we may have edeball plastick rappers soon

Lessons on TIDE from *Power Up*:

- Topic Sentence on page 58
- Ideas on page 68
- Details on page 76
- Endings/Conclusion on page 90

Goal-setting menu from *Releasing Writers*

The logo for 'think SRSD' features the word 'think' in a green, lowercase, sans-serif font with a small lightbulb icon above the 'i'. Below it, 'SRSD' is written in a bold, green, uppercase, sans-serif font.

thinksrsd.com

Text elements in an informational essay

(Collins et al., 2021; Harris et al., 2023)

Topic Sentence: Tells the reader the big idea; answers the prompt

Ideas: Categories of ideas (1 point per category) that help make your point

Details: Provide evidence that supports your ideas

Ending/conclusion: Summarize what you said



Katie Valentine, MA



Writing
Architect

Visualizing spelling, vocabulary, grammar/sentence structure

Scoring

Reset All

Reset Selected

Undo

^ You ^ could W proboly W eat ^ a ^ cheese ^ wrapper ^ but ^ not ^ like ^
a ^ pizza ^ wrapper ^ . W why S\$ because ^ you ^ will ^ be ^ in ^ a ^ lot
^ of ^ pain ^ and ^ you ^ would ^ have ^ to ^ go ^ to ^ the W docter W
^ A ^ cheese ^ wrapper ^ is ^ not W to W big ^ like ^ a ^ pizza ^
wrapper S\$ and ^ the ^ pizza ^ wrapper ^ will ^ be ^ hard ^ to ^ chew ^
but ^ the ^ cheese ^ stick ^ is S\$. ^ You ^ can ^ also W proboly W eat S
like S a W oreo ^ cookie ^ wrapper ^ not ^ the ^ big ^ ones S\$ the ^ little
^ tiny ^ ones ^ .

WORD	W CAPITAL	W [text]	Missing Capitalization
	W SPELLING	W [text] W	Misspelled Word
	W SPELLING	[text] W	Single Incorrect Sequence
SENTENCE	S INACCURATE	[text] S\$	Missing Punctuation or Word
	S INACCURATE	S [text] S	Incorrect Punctuation or Grammar or Word/Meaning Doesn't Fit
	S INACCURATE	[text] S	Single Inaccurate Sequence
	S OVERLAP	S [text] S	Feature common to both NMAE & DLD

TATE UNIVERSITY | COPYRIGHT 2021-2022

Word accuracy = 88% words spelled correctly

Sentence accuracy = 89% words in correct sequence

Word complexity = 9 long words (7 or more letters)

HIGH LEVERAGE FEATURES OF WRITING

FEATURE	TEXT STRUCTURE	WORD COMPLEXITY	WORD ACCURACY	SENTENCE ACCURACY	TYPING FLUENCY								
GOAL BY END OF GRADE 5	8 elements: 1T, 3Is, 3DS, 1E	13 long words in 15 minutes	93% of words are spelled correctly	95% of word sequences are accurate	85 characters typed in 90 seconds								
DEFINITION	Informational text elements and organization	Total number of long words (7+ letters)	Spelling	Punctuation and word order correctness	Speed of typing								
INSTRUCTIONAL STRATEGY	<ul style="list-style-type: none">Explicitly define each element, color-code them in other texts.Use a graphic organizer for TIDESet goals for TIDE elements and provide feedback from self, peers, and/or teachers.	Explicitly teach prefixes, suffixes, Greek & Latin roots, connective words, and key content words.	Explicitly teach spelling by grouping words according to phonologic, orthographic, and morphologic patterns.	Explicitly teach that a complete sentence includes punctuation and capitalization, is not a fragment nor a run-on, and it expresses one idea.	Explicitly teach use of the home row keys and provide practice to fluency.								
EXAMPLE	<p>Jump rope is a way to stay healfy.</p> <p>When your jumping your excriseing.</p> <p>The better you exrise...</p> <table><tr><td>T</td><td>I</td><td>D</td><td>E</td></tr><tr><td></td><td></td><td></td><td></td></tr></table>	T	I	D	E					<p>Jump rope is a way to stay healfy.</p> <p>When your <u>jumping</u> your <u>excriseing</u>.</p> <p>The better you exrise...</p>	<p>Jump rope is a way to stay healfy.</p> <p>When <u>your</u> jumping <u>your</u> <u>excriseing</u>.</p> <p>The better you <u>exrise</u>...</p> <p><small>*Scored using correct minus incorrect word sequences (CIWS) rules.</small></p>	<p>Jump rope is a way to stay healfy.</p> <p>When your jumping your excriseing.</p> <p>The better you exrise...</p> <p><small>*Scored using correct minus incorrect word sequences (CIWS) rules.</small></p>	<p>^{1 2 3 4 5 6 7 8} Jump rope</p> <p>^{9 10 11 12 13 14 15 16} is a way to</p> <p>^{17 18 19 20 21 22 23 24 25 26 27} stay healfy.</p>
T	I	D	E										



Writing Architect

Summary of three studies from 2017, 2023, 2024

How we expanded the Science of Writing

- 5 components predicts English Language Arts achievement
- Most predictive because it measures informational writing
- New way to monitor vocabulary

Raises more implementation science questions

- Make instruction more useable & feasible
- Provide support (PD & materials)

Informational writing gives better insight

Component skill	Correlation to state & nationally-normed tests	Individualized goal-setting
Text structure elements (TIDE)	.60 to .66	8
Vocabulary (long words)	.56 to .57	13
Spelling	.43 to .60	93%
Punctuation & grammar	.46 to .56	95%
Typing fluency (characters in 90 sec)	.35 to .46	85

- Predicts 57% variance in student performance on grade level expectations (state test).
- Classroom task correlates to gold standard measures of writing. (currently analyzing 2 replication studies)
- Goals allow for individualizing grade level instruction.
- Reports link teachers to research-based routines in the Writing Architect repository.


Truckenmiller, Cho, & Troia, 2022, *Journal of School Psychology*

Sarmiento, Truckenmiller, Cho, & Wang, 2024, *British Journal of Educational Psychology*

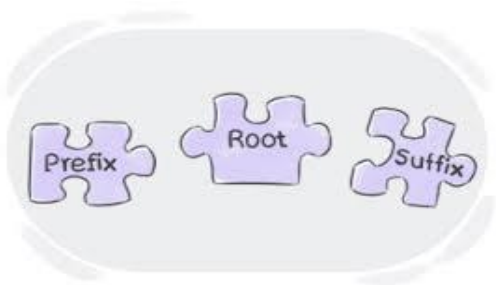


Vocabulary – long words

Sarmiento, Truckenmiller, Cho, & Wang, 2024, *British Journal of Educational Psychology*



Words with common morphemes (affixes & root words)	Connectives (aka conjunctions, discourse markers, signals)	Content words (important nouns)
Biology	Basic: and, because, but, or	Names
Photosynthesis	Temporal: first, while, recently	Locations
Representation	Causal: as, therefore	Concepts represented by a word
Democracy	Logical: likewise, otherwise, although, despite, even if	Things
Location	Adversative: however, unlike, as though	Nominalizations (verbs turned into nouns)
Homeostasis	Organizational: for example, according to, on this basis, rather, overall	
Population	(Andreev & Uccelli, 2020)	

Dr. Cherish Sarmiento



Make observations: Notice and note shape, color, texture, size, smell, temperature, and living things.

Golden rod

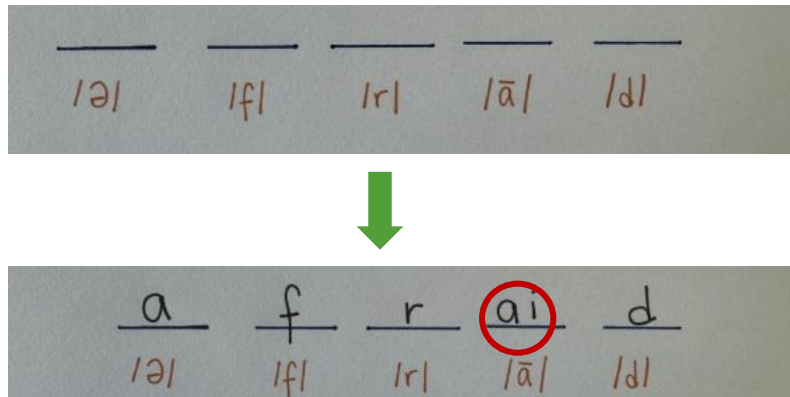
Plant Structure	What do you notice? Write / Sketch
Leaves	 <p>one leaf has multiple other leaves on it.</p>
Stem	 <p>The stem is thin and fuzzy.</p>

Integration to content areas

5th grade writing sample from Dr. Cherish Sarmiento

Spelling instruction matters– not the memorize a list way

Vowel Teams	
Week 1, Day 1: Monday	
Long vowel: /ā/	Target Spelling Pattern ai
SWBAT identify and encode correct ai patterns in words that correspond to /ā/	
Spelling List for <u>instruction</u> : afraid, explain, painted, training, sailor	
Spelling List for <u>pre-check</u> : waiter, detail, braided, complain, detain	
Spelling List for <u>post-check</u> : Jamaica, regain, sustain, terrain, attain	



Pre/Post Assessments ("checks")

Sailor | *Marinero*

- A person that works on a boat or a ship
- Una persona que trabaja en un barco o en un buque

The integration of translanguageing practices enables teachers to plan spelling lessons effectively for their multilingual students.

Instructor:

Afraid is when you have fear of something! Like being afraid of the dark.
Afraid in Spanish can be *asustado* or *miedo*. So if I said, “*tenía miedo de la oscuridad*” (I was afraid of the dark), or “*estaba asustada!*” (I was afraid), it means the same thing as afraid.



Pamela Moura,
MSc

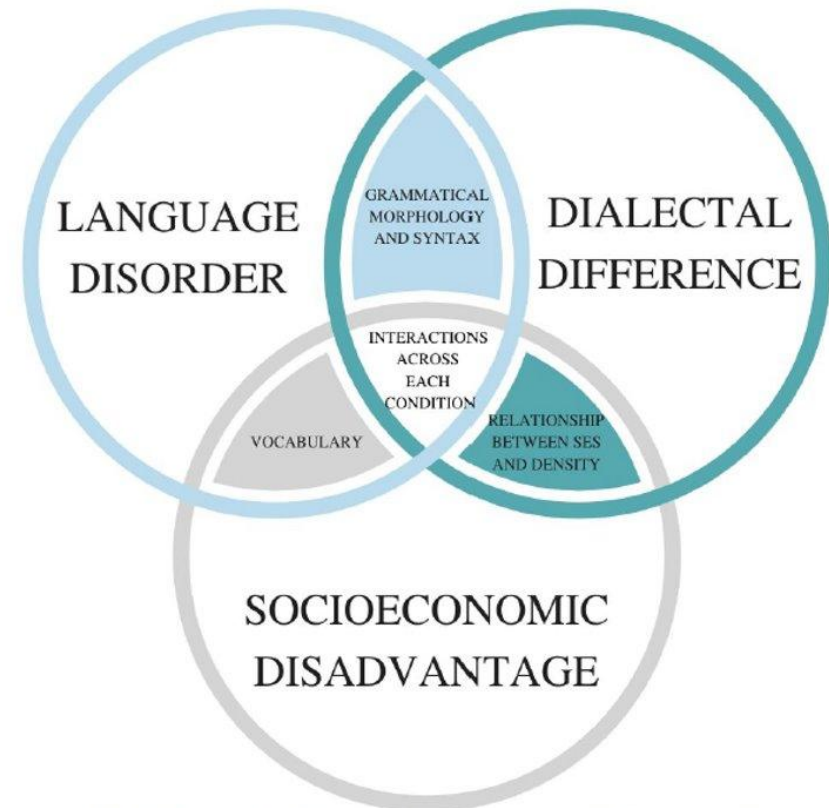
Differentiating grammar errors from language variation

- ^She ^talk ^a ^lot ^.

Culturally
sustain use of
language
variety

- ^They ⓈhasⓈ to ^go

Provide
grammar
instruction

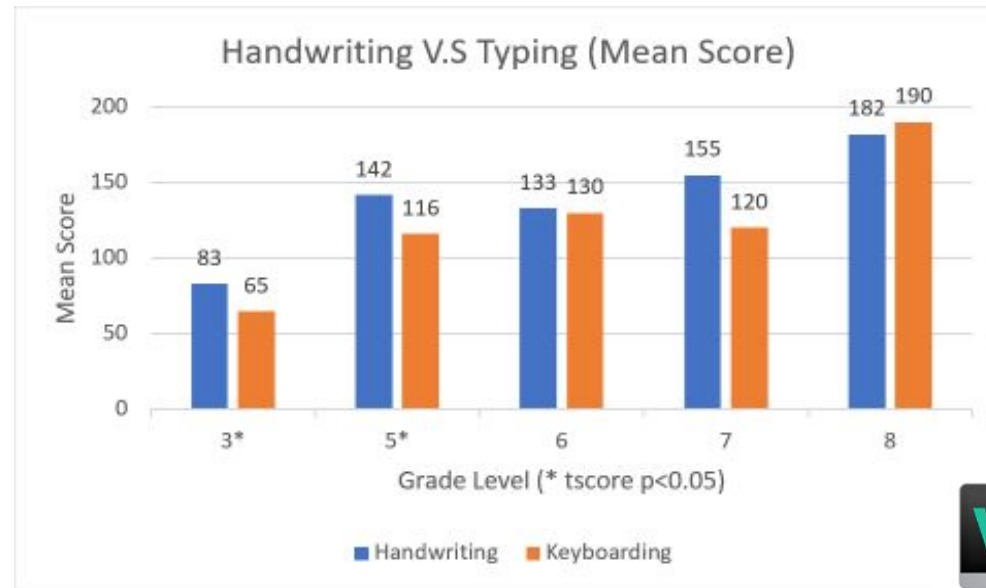


Lindy Johnson

Typing fluency



- Constrains or facilitates getting your ideas out.
- Intertwined with spelling. (Troia et al., 2020, Education Science)
- No studies on teaching typing (Novelli et al., 2024)



Writing
Architect

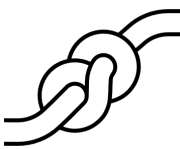
Implementation Study

- 37 classrooms randomly assigned to use the Writing Architect in the winter or to the waitlist group in spring
- **Writing Architect Support included:**
 - Students' scores in the 5 components to teachers
 - Each component hyperlinked research-based instructional routines and programs in our repository and in the *Releasing Writers* and *PowerUp Your Writing* books
 - 3 PD sessions (8 hours total)
 - Teachers set a goal and plan for instruction
 - We conducted an observation and feedback
 - 6 weeks instruction time between giving student scores and posttest
- Continuing to analyze observation data and implementation surveys

Preliminary results, TIDE effect size = 0.12

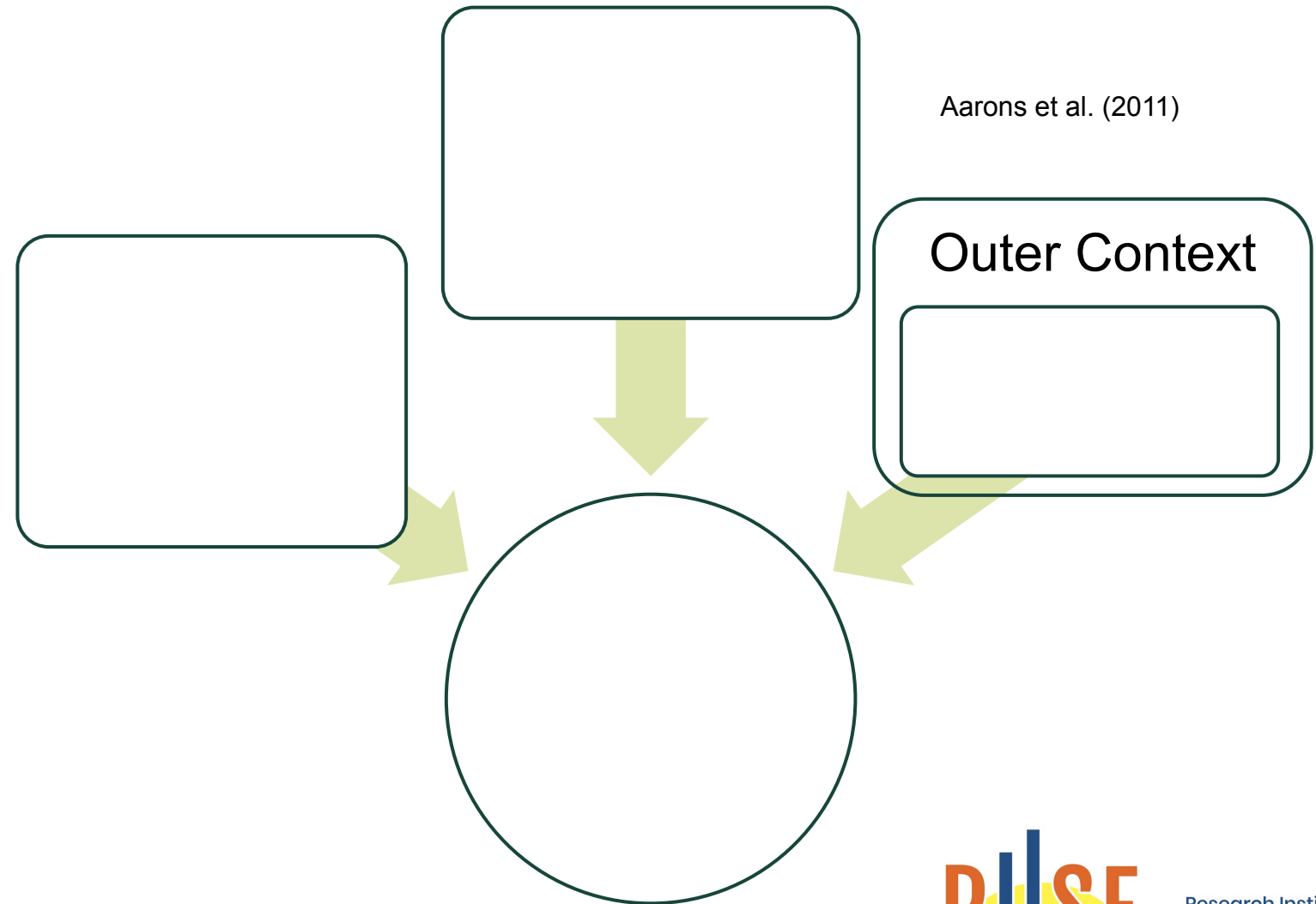
How do we address barriers with innovations?

Implementation Science

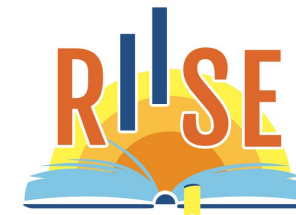
research  practice



Dr. Courtenay
Barrett



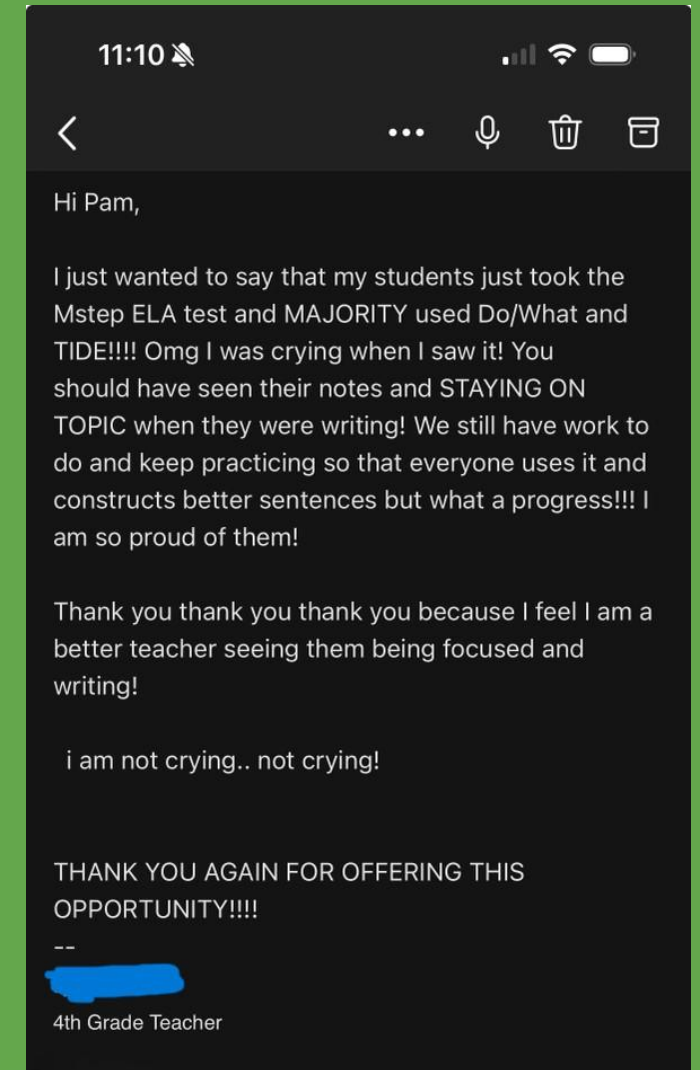
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Research Institute
for Implementation
Science in Education

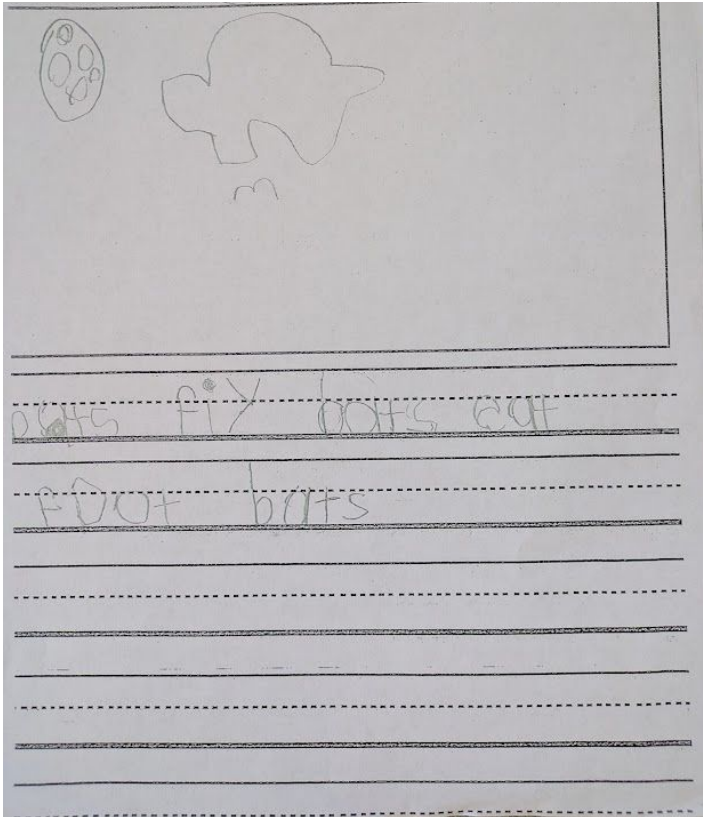
When teachers apply their unique skills in engaging learners

How do we facilitate replication?

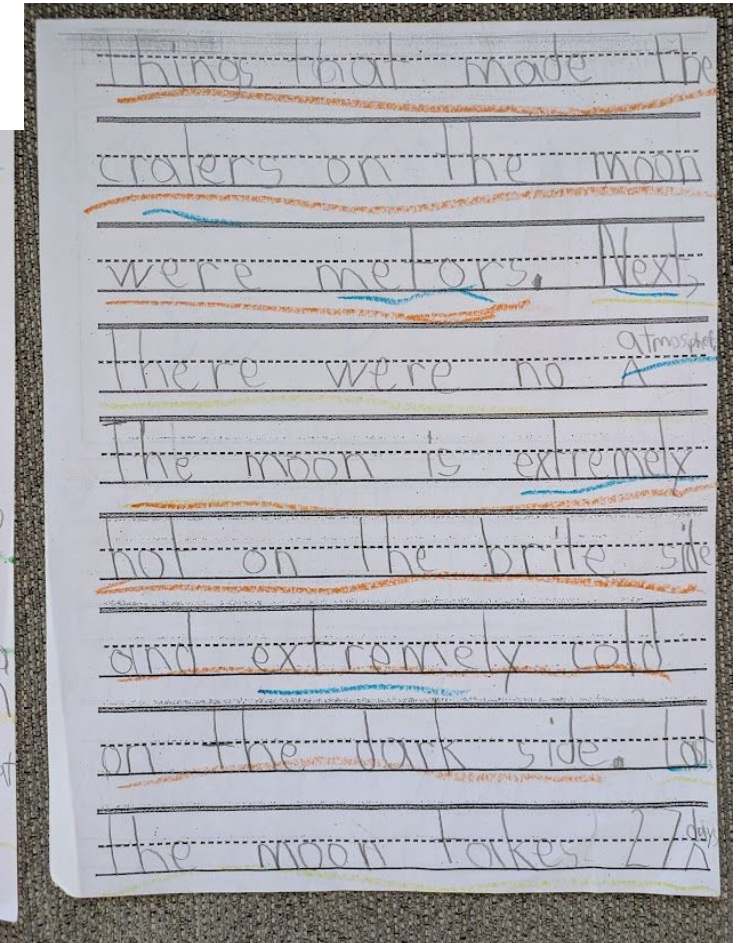
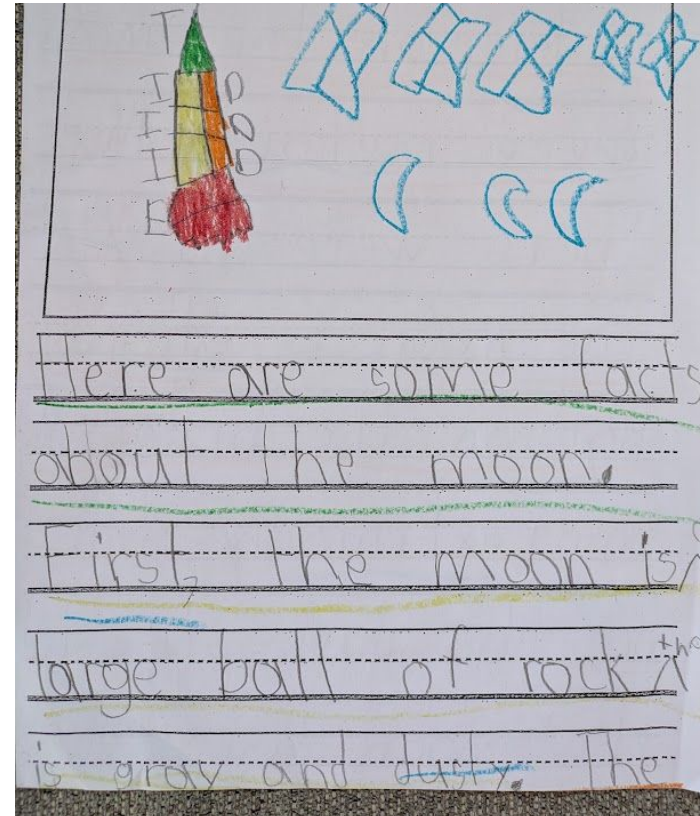


Others have been highly effective

Karen Harris, Alyson Collins, Leslie Laud

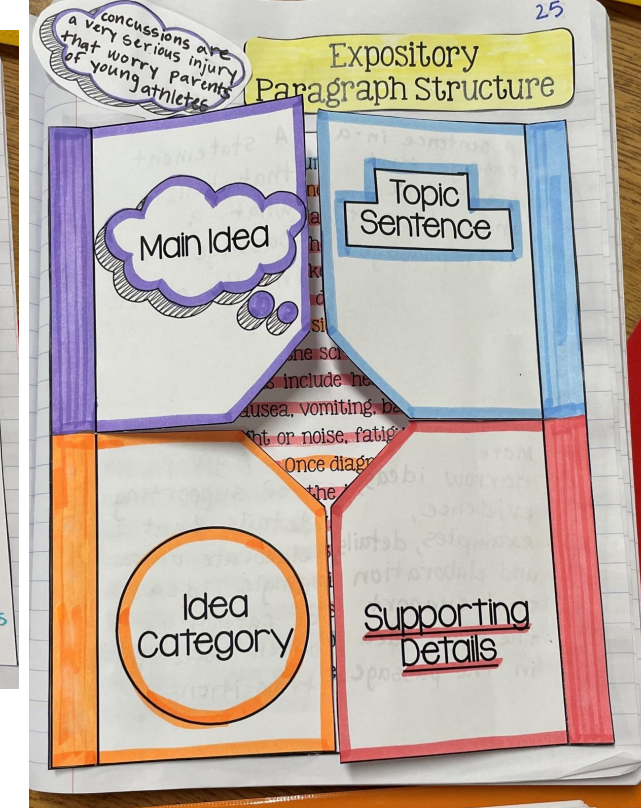
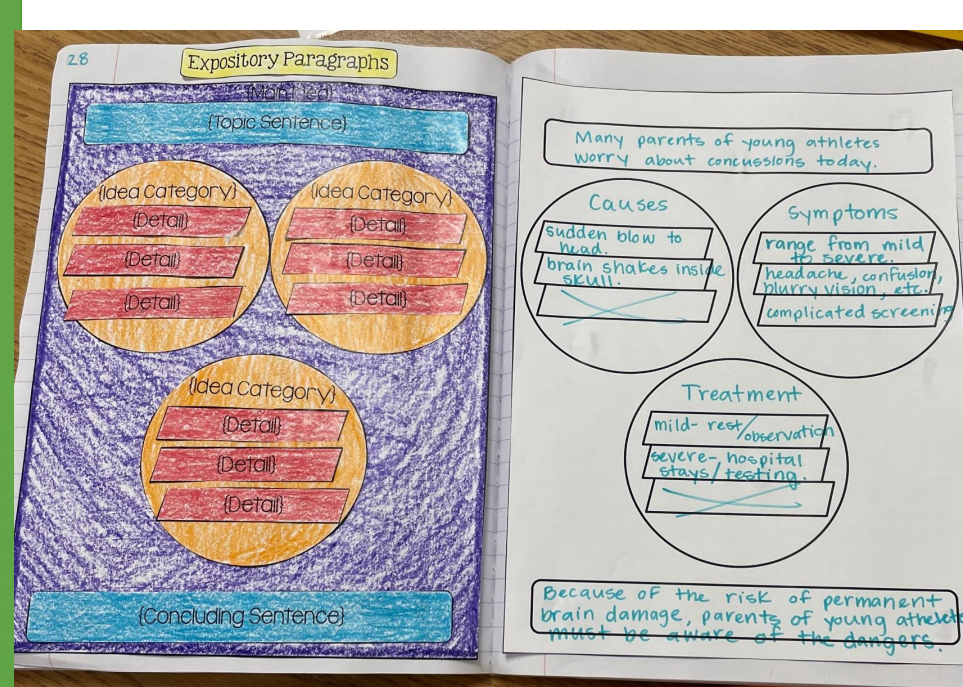


Stanley, Grade 1, August to January



Writing samples from Lindsay Kemeny

Implementation opportunities



Erin Cobb, Interactive Writing Notebook

- Committed monthly PLC schedule for teachers to meet and discuss.
- Principal, superintendent, & coaches fully engaged in training & seeking resources
- Not a curriculum leader or facilitator?
- Initial barrier
- Already-created lessons may address confidence & time
- INFORMATIONAL WRITING
- Need more than one short unit on informational writing in Tier 1 curricula
- Effective SRSD/TIDE instruction (social studies) lasts ~16 weeks (Collins et al 2021).
- Informational text structure & vocab drives outcomes (Sarmiento et al., 2024; Truckenmiller et al., 2020)
- Writing the language comprehension strand improves outcomes in reading, science, and social studies (Graham, Kiuahara, & MacKay, 2020)