

Teachers' Knowledge to Support Literacy Learning and Related Research



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Teachers' Knowledge to Support Literacy Learning and Related Research

OUTLINE



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Conceptual underpinnings



What should teachers know?

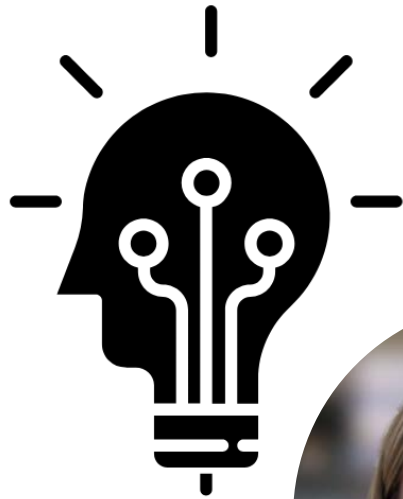


To what extent does knowledge relate to classroom practice and student learning?



Does professional learning impact knowledge and student learning?

Conceptual Underpinnings

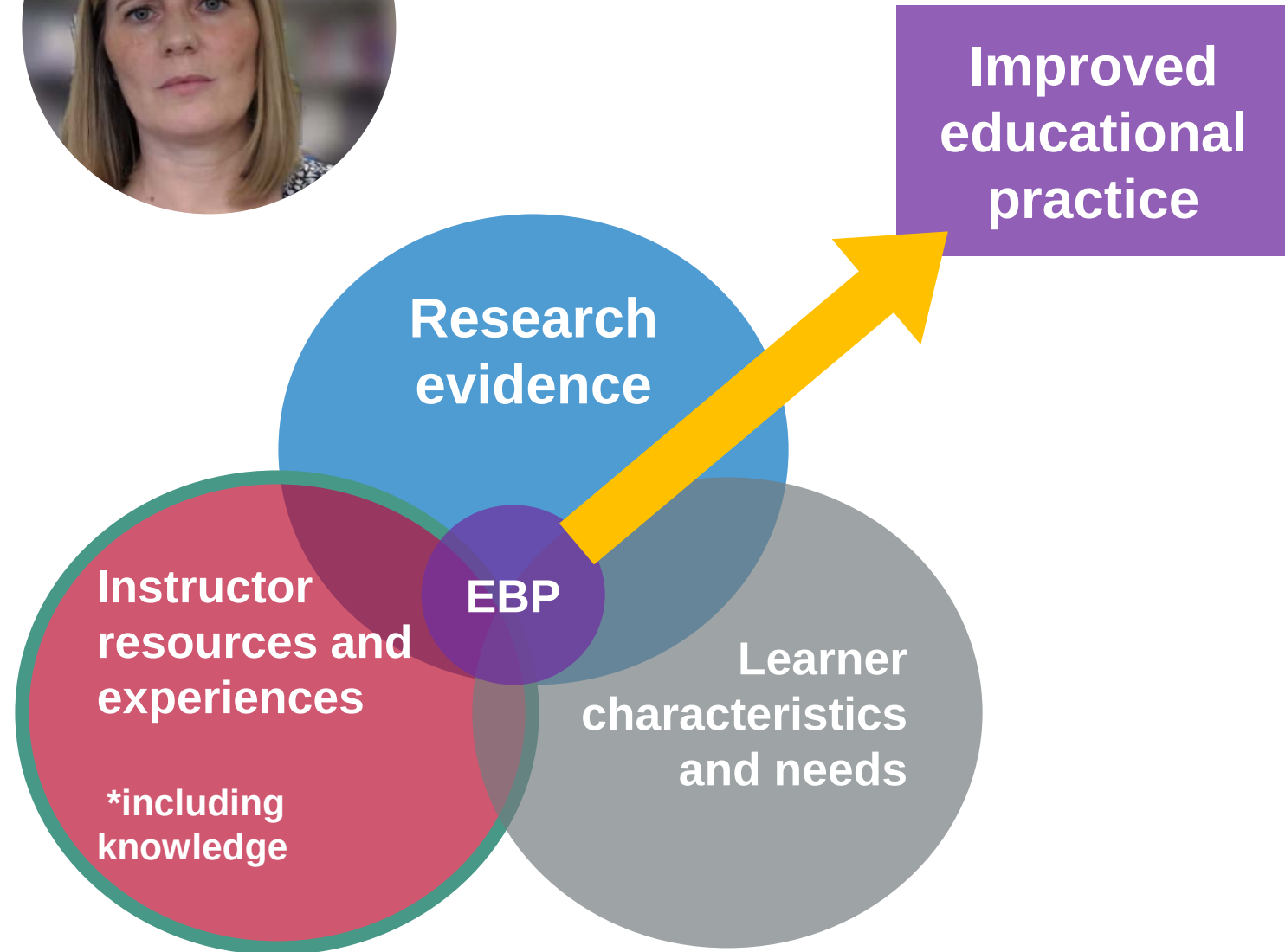
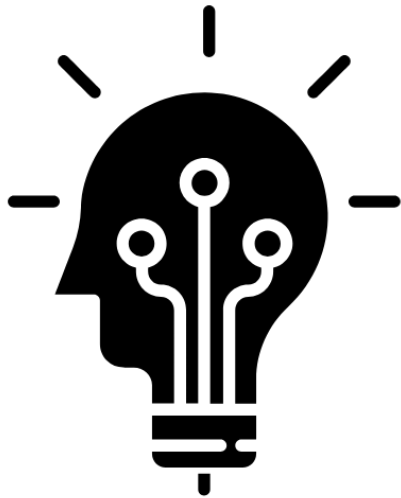


“Literacy is the human ability to decode, understand, and use signs such as letters, numbers, diagrams, graphs, drawings, and pictures. A precondition for literacy is spoken language and pragmatic understanding.”

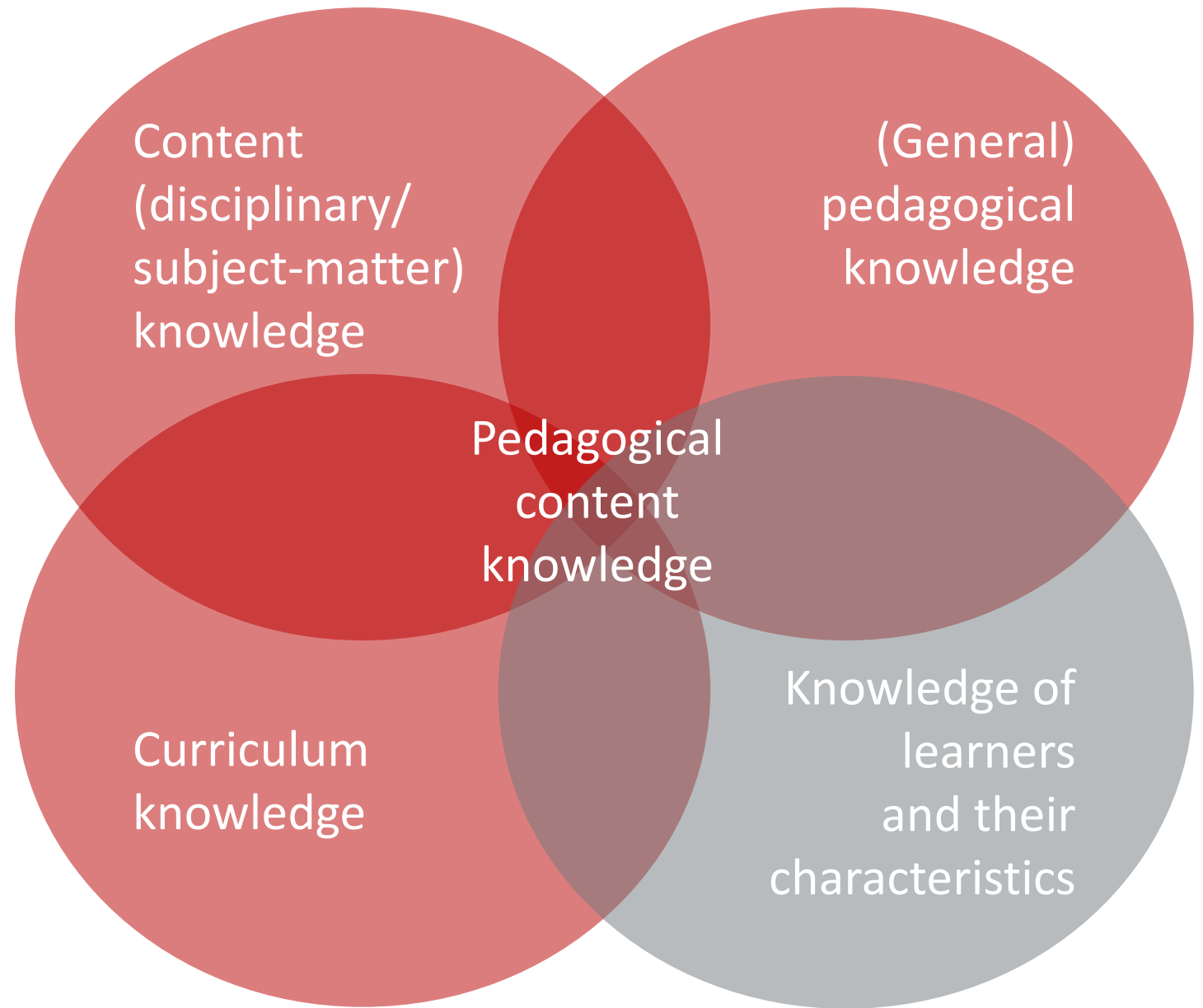
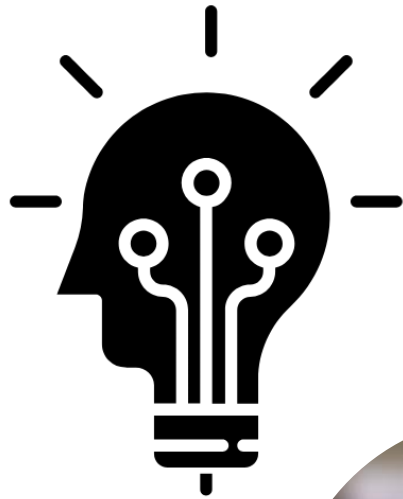
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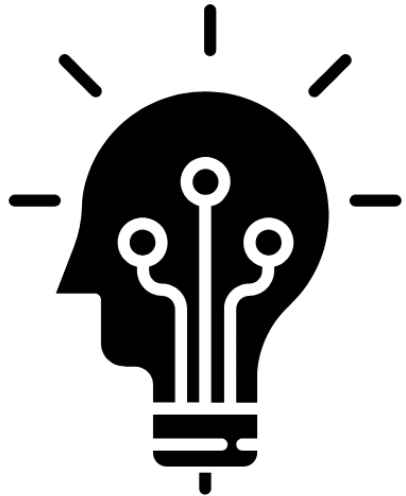


Conceptual Underpinnings



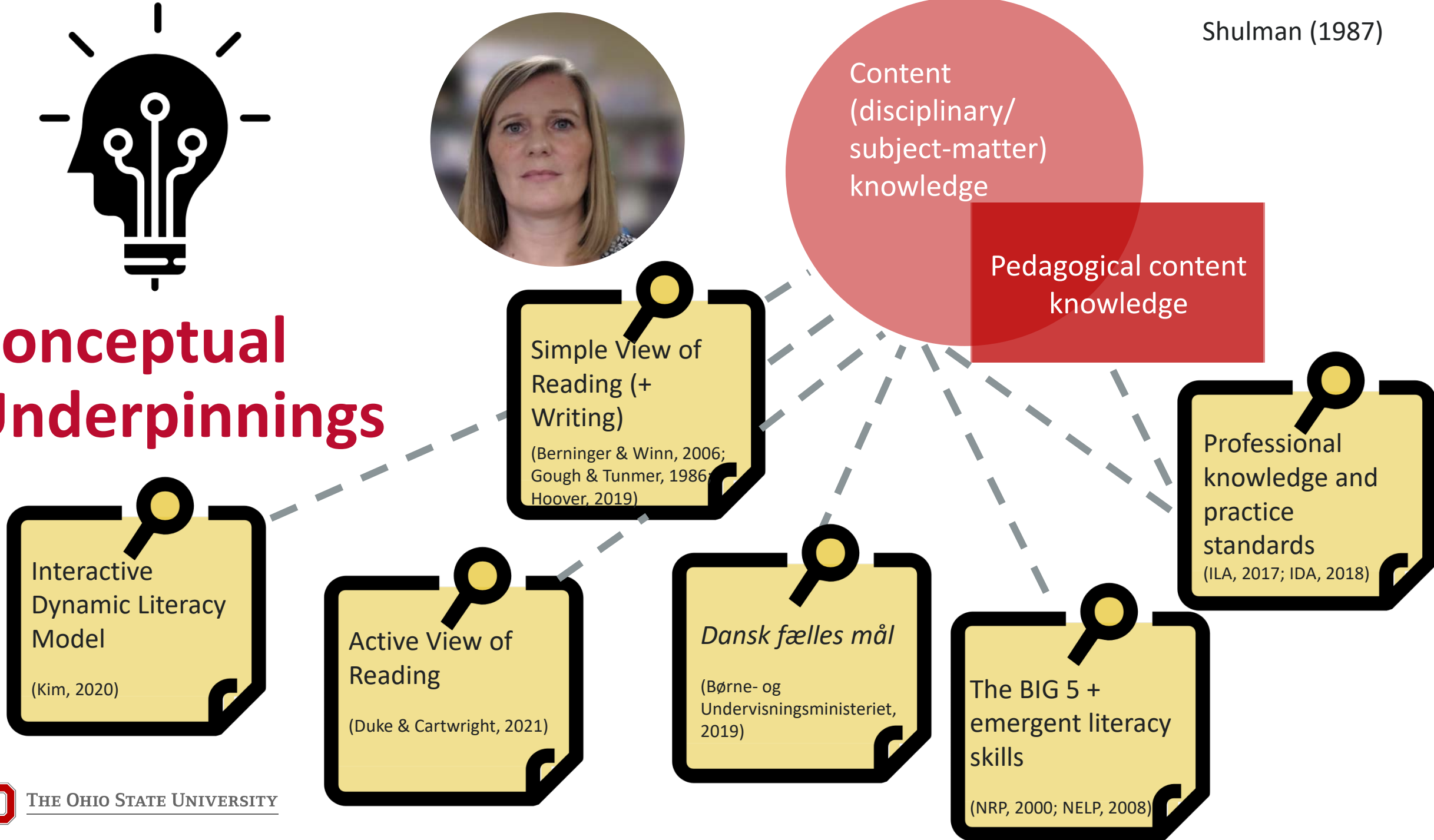
Conceptual Underpinnings





Shulman (1987)

Conceptual Underpinnings



SVR:

Language
comprehension

X

Word reading

=

Skilled reading
(comprehension)

Simple View of Reading

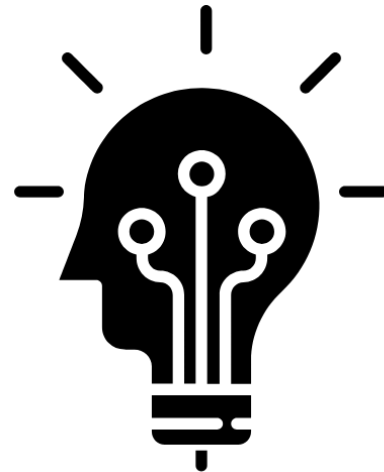
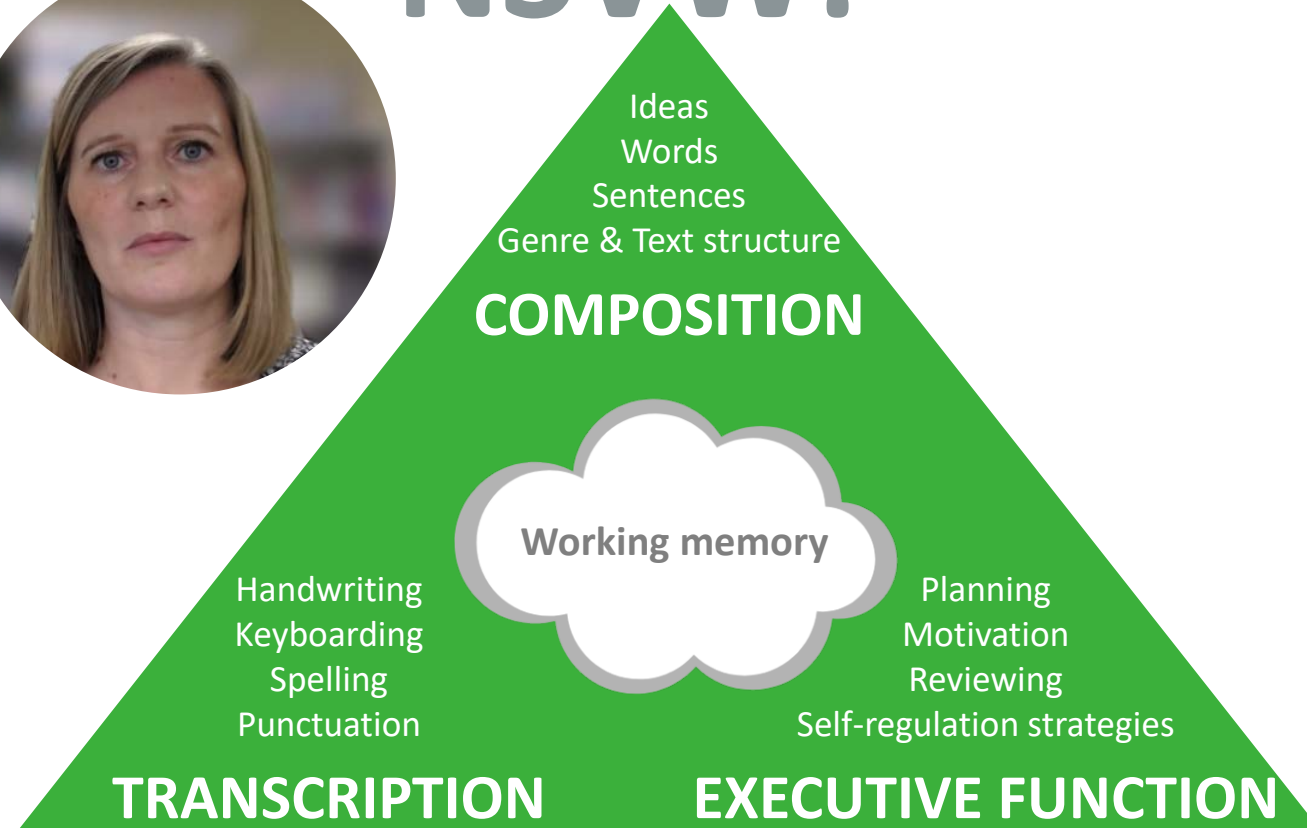
(Gough & Tunmer, 1986; Hoover & Tunmer, 2018)

Not-so-Simple View of Writing

(Berninger & Winn, 2006)

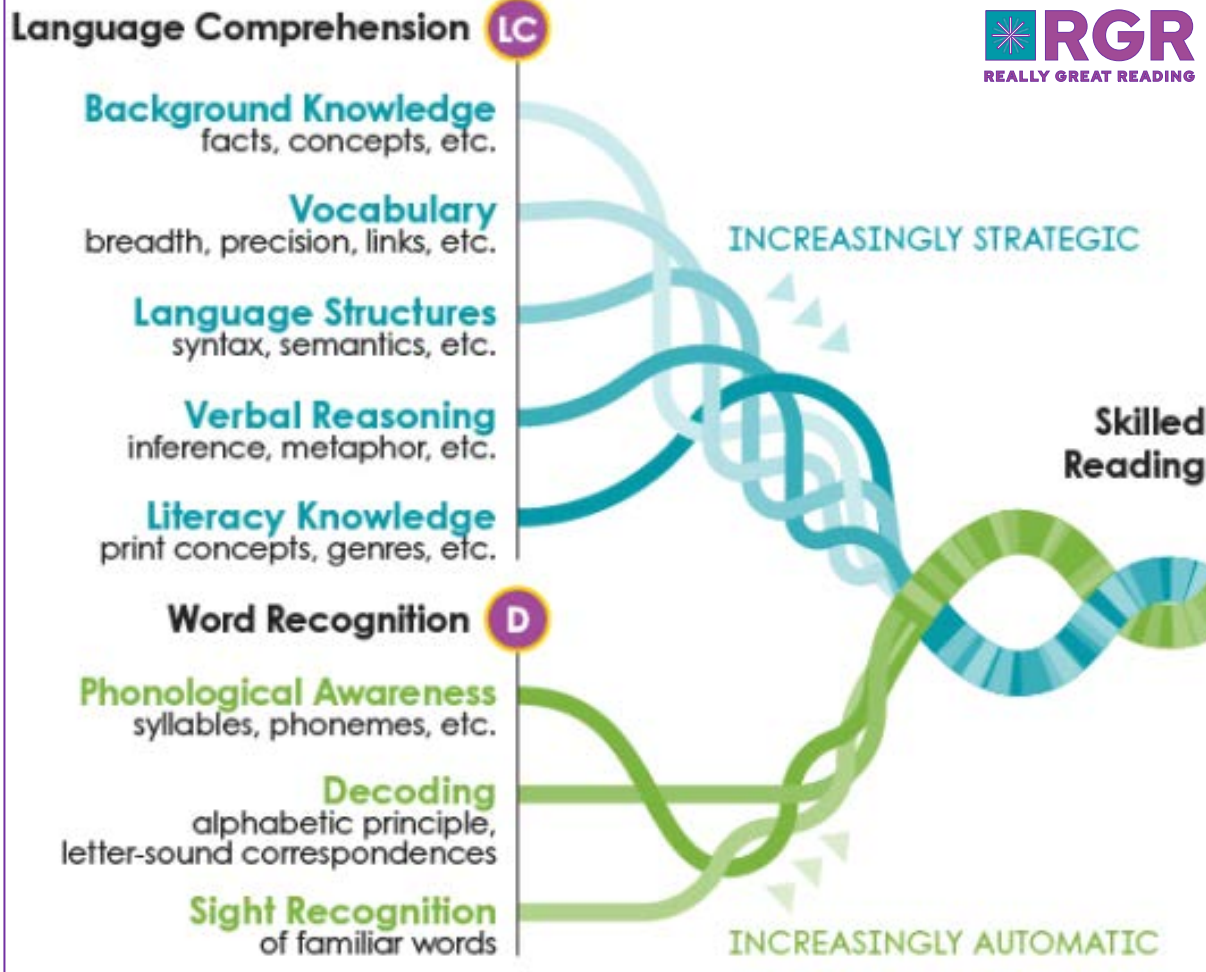


NSVW:



The Reading Rope

(Scarborough, 2001)



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CRITICAL THINKING

- Generating ideas, gathering information
- Writing process: organizing, drafting, writing, revising

SYNTAX

- Grammar and syntactic awareness
- Sentence elaboration
- Punctuation

TEXT STRUCTURE

- Narrative, informational, opinion structures
- Paragraph structure
- Patterns of organization (description, sequence, cause/effect, compare/contrast, problem/solution)
- Linking and transition words

WRITING CRAFT

- Word choice
- Awareness of task, audience, purpose
- Literary devices

TRANSCRIPTION

- Spelling
- Handwriting, keyboarding

SKILLED WRITING

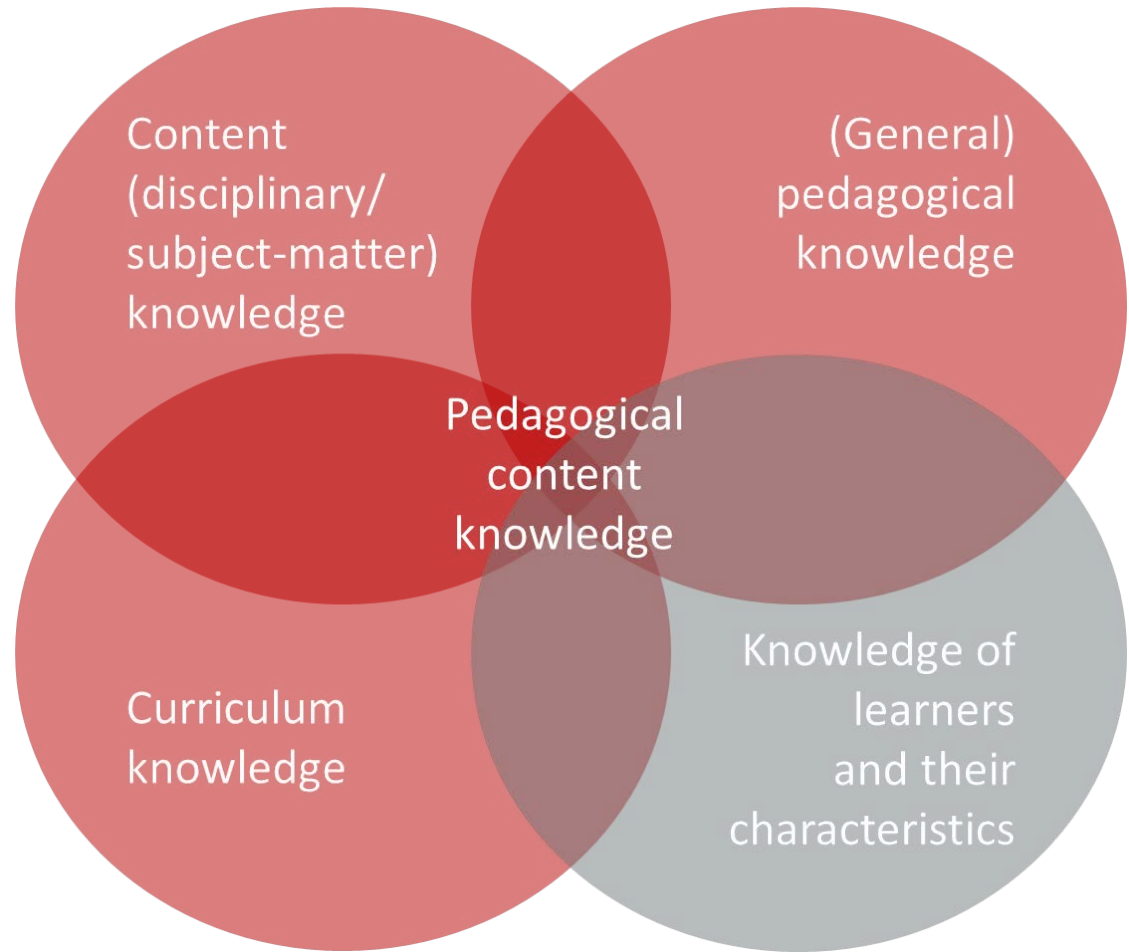
Composition



The
Writing
Rope
(Sedita, 2019)



What Should Teachers Know?



Content knowledge = knowing **WHAT**

Pedagogical (content) knowledge = knowing **HOW**



Reading



Vocabulary

Background knowledge

Verbal reasoning

Literacy knowledge



(Børne- og Undervisningsministeriet, 2019)

Class-step	Competency goals	Skill and knowledge areas and goals							
After 2nd grade level	The student can read simple texts confidently and use them in everyday contexts.	Preparation		Decoding*		Language comprehension		Text comprehension	
		The student can prepare for reading through conversation in class.	The student has knowledge of ways to create preconceptions.	The student can read words in texts for grade level safely.	The student has knowledge of the context-dependent pronunciations of letters.	The student can identify unknown words in text and speech.	The student has knowledge of words and expressions in instructions and tasks.	The student can reproduce the main content of texts for the grade level.	The student has knowledge of the structure of narrative and informative texts.
		The student can use simple pre-reading strategies.	The student has knowledge of simple pre-reading strategies.		The student has knowledge of spelling and meaning of words in texts for the grade level.	The student can understand the meaning of content words in context.	The student has knowledge of differences and similarities in the meaning of words.	The student can combine text and background knowledge to create coherent understanding.	The student has knowledge about the interaction between the information in the text and the reader's knowledge.
After 4th grade level	The student can read multimodal texts for the purpose of experience and professional knowledge.	Preparation		Decoding*		Language comprehension		Text comprehension	
		The student can structure his/her background knowledge.	The student has knowledge on methods for structuring knowledge.	The student can read words in texts for the grade level quickly and confidently.	The student has knowledge of rules for composing words.	The student can use dictionaries and reference works to clarify the meaning of words.	The student has knowledge of the function and structure of reference works and dictionaries.	The student can identify elements in the text that create coherence.	The student has knowledge about text types.
		The student can formulate simple reading objectives.	The student has knowledge of experiential reading and academic reading.		The student has knowledge of word classes and rules for inflection of words.	The student can use super and sub-concepts to create a coherent understanding of the text.	The student has knowledge of super and sub concepts.	The student can handle problems with understanding the text.	The student has knowledge of reading comprehension strategies.
After 6th grade level	The student can read and relate to texts in academic and public together-hang.	Preparation		Decoding		Language comprehension		Text comprehension*	
		The student can orient themselves in the parts of the text.	The student has knowledge of rubrics, pictures, diagrams and graphics.	The student can read unknown words by immediately recognizing the most common word parts.	The student has knowledge of morphemes in Danish words.	The student can use headings and highlighted words to create understanding of texts.	The student has knowledge of words and expressions that explain new material.	The student can reproduce the main content of subject texts.	The student has knowledge of the structure of academic texts.
		The student can compare the purpose and content of texts with the reading objectives.	The student has knowledge about the purpose of texts and about reading purposes.	The student can read unknown words in AG texts.	The student has knowledge of spelling and meaning of words in academic texts.	The student can deduce parts of the meaning of words from the context.	The student has knowledge of word comprehension strategies.	The student can use graphic models to gain an overview of the structure and content of texts.	The student has knowledge of graphic models.
After 9th grade level	The student can control and regulate their reading process and discuss the meaning of texts in their context.	Preparation		Decoding		Language comprehension		Text comprehension	
		The student can evaluate the sender of the text and target group.	The student has knowledge about sender relations and target group.	The student can consciously vary reading speed according to reading purpose and vocabulary knowledge in the text.	The student has knowledge of the relationship between word recognition and reading speed.	The student can evaluate the text's linguistic means.	The student has knowledge of linguistic means.	The student can co-understand information from different elements in the text.	The student has knowledge about the structure and function of text elements.
		The student can gain an overview of the structure of multimodal texts.	The student has knowledge of genre features and multimodality.	The student can read complex Danish and borrowed words quickly and confidently.	The student has knowledge of morphemes in loanwords.	The student can assess the meaning of words and concepts in relation to the origin of the text.	The student has knowledge of sociolects and formal language.	The student can summarize information from several texts.	The student has knowledge of methods for combining information from several texts.
		The student can decide how a text should be read.	The student has knowledge of pre-reading strategies.	The student can read complex texts quickly and confidently.	The student has knowledge of spelling and meaning of words in all texts.	The student can use the meaning of words and expressions to understand complex texts.	The student has knowledge about the importance of word choice for the message.	The student can understand complex texts.	The student has knowledge of methods for assessing the purpose and perspective of texts.

Decoding

Language structures

Fluency

Writing			Skill and knowledge areas and goals									
Class-step	Competency goals	Phases										
After 2nd grade level	The student can express himself in writing, speech, sound and image in familiar and familiar situations.		Handwriting and layout		Preparation		Manufacturing*		Response		Correction*	
		1. The student can write lowercase and uppercase letters in handwriting and on the keyboard.	The student has knowledge about how to write letters and the structure of the keyboard.	The student can formulate questions.	The student has knowledge of simple idea development methods.	The student can create simple texts with pictures and writing.	The student has knowledge about the structure of language in words and sentences and about the connection between writing and images.	The student can discuss the message in a production.	The student has knowledge about the message of products.	The student can spell easy words.	The student has knowledge of letter-sound connections.	
		2. The student can use simple functions in word processing.	The student has knowledge of formatting functions.	The student can use simple templates to structure their material.	The student has knowledge of simple outlines.	The student can produce simple texts with a title, beginning, middle and end.	The student has knowledge of genre features of simple narrative and informational texts.	The student can use templates in response.	The student has knowledge of text structure.	The student can spell common words.	The student has knowledge of the spellings of phonetic and non-phonetic words.	
After 4th grade level	The student can express themselves in writing, speech, sound and images in familiar professional situations.		Handwriting and layout		Preparation		Manufacturing*		Response		correction	
		1. The student can write with a legible and connected handwriting and on keyboard.	The student has knowledge of effective writing techniques.	The student can develop ideas based on other texts.	The student has knowledge of methods for examining language and structure in texts.	The student can express themselves creatively and experimentally.	The student has knowledge of vocabulary and linguistic options.	The student can respond to the genre and structure of texts.	The student has knowledge of the genre and structure of texts.	The student can use punctuation marks.	The student has knowledge of full stops, question marks, and exclamation marks.	
		2. The student can use simple, genre-appropriate layout.	The student has knowledge of setting up text in handwriting and word processing.	The student can divide the manufacturing process into smaller parts.	The student has knowledge of simple manufacturing processes.	The student can produce multimodal texts.	The student has knowledge of descriptive and narrative forms of presentation.	The student can respond to the genre and purpose of texts.	The student has knowledge of the aesthetic and academic purposes of texts.	The student can spell based on the meaning of the words.	The student has knowledge of morphemes, word classes, sound sequence rules and lookup technologies.	
After 6th grade level	The student can express himself in writing, speech, sound and image in formal situations.		Planning		Preparation		Manufacturing		Response		correction	
		1. The student can use IT and thinking tools to get ideas.	The student has knowledge of IT and thinking tools for idea development.	The student can concretize ideas through thought writing.	The student has knowledge of thought writing, brainstorming and mind mapping.	Students can prepare reviews, instructions and professional texts.	The student has knowledge of commenting and explanatory presentation forms.	The student can give and receive feedback.	The student has knowledge of response methods.	The student can use paragraphs and use commas.	The student has knowledge of sentence and text structure.	
		2. The student can organize processes for the production of professional products alone and in collaboration with others.	The student has knowledge of manufacturing processes.	The student can prepare preliminary products for dramatic, documentary and interactive productions.	The student has knowledge of synopsis, manuscript and storyboard.	The student can create dramatic, documentary and interactive products.	The student has knowledge of the means of drama and documentary in film, on television and on the internet.	The student can respond to criteria-based measures.	The student has knowledge of response based on established criteria.	The student can spell all common words correctly.	The student has knowledge of inflection systems and word origins.	
After 9th grade level	The student can express oneself in an understandable, clear and varied way in writing, speech, sound and images in a form that suits the genre and situation.		Planning		Preparation		Manufacturing		Response		Correction*	
		1. The student can independently formulate a limited task.	The student has knowledge of task and problem formulation.	The student can categorize information and manage the content.	The student has knowledge about questioning techniques and observation methods.	The student can produce opinion and expressive texts.	The student has knowledge of argumentative and reflective forms of presentation.	The student can respond to different forms of presentation.	The student has knowledge of production methods.	The student can register and correct his own and others' mistakes.	The student has knowledge of linguistic correctness.	
		2. The student can organize collaboration on production.	The student has knowledge about production planning, roles, phases, resources, task types and deadlines.	The student can prepare larger multimodal productions.	The student has knowledge of research, recording and sketches.	The student can produce larger multimodal productions.	The student has knowledge of tools, graphic design and post-production.	The student can respond to linguistic style.	The student has knowledge of linguistic style.	The student can correct the layout of texts.	The student has knowledge of methods for layout of different genres.	
		3. The student can organize the process from idea to finished product.	The student has knowledge of complex manufacturing processes.	The student can arrange and layout material so that it promotes the purpose of the product.	The student has knowledge of targeted presentation and communication methods.	The student can produce coherent texts in different genres and styles.	The student has knowledge of varied forms of expression aimed at different target groups.	The student can respond to the relationship between production and genre.	The student has knowledge of genre features.	The student can produce texts with correct grammar and layout.	The student has knowledge of correct grammar, spelling, punctuation and layout.	

Text Structure

Writing Craft

Critical Thinking

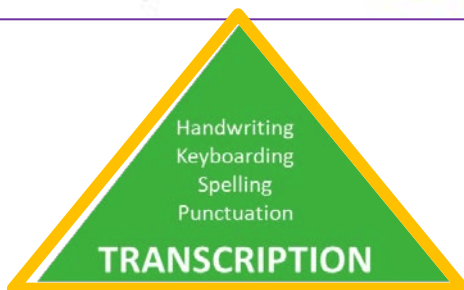
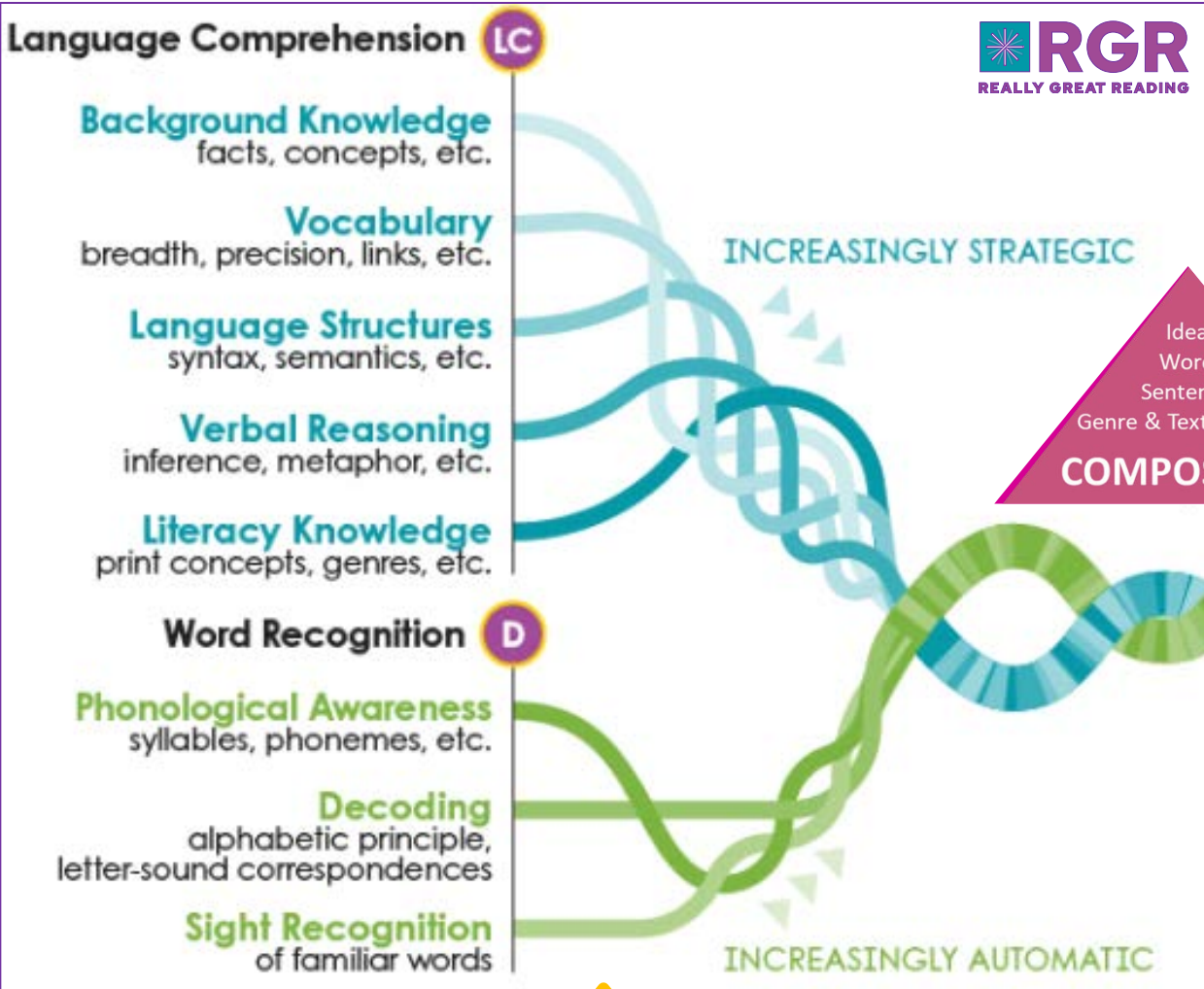


Transcription



Syntax

(Børne- og Undervisningsministeriet, 2019)



- **Vocabulary content and pedagogical knowledge** (Duguay et al., 2015)
- **Syntactic content knowledge** (Brimo & Melamed, 2017)
- **Morphological content and pedagogical knowledge** (Dilgard & Hodges, 2025; Washburn & Mulcahy, 2019)
- **Oral language content and pedagogical knowledge** (Goldfeld et al., 2020; Kidd & Rowland, 2021; Mathers, 2021; Phillips et al., 2020; Piasta et al., 2022)
- **Writing** (Quinn et al., 2025; Wijekumar et al., 2019)
- **Reading comprehension** (Davis et al., 2022; Dixon & Oakhill, 2024; Hudson, 2023; Wijekumar et al., 2019)
- **Adolescent literacy/content area literacy** (Meyer, 2013; Spor & Schneider, 1998; Washburn & Pierce, 2024)
- **The Big 5 content and pedagogical knowledge** (Carlisle et al., 2011; Davis et al., 2022; Hall et al., 2025)
- **Word reading content knowledge** (e.g., Binks-Cantrell et al., 2012, Cohen et al., 2017; Cunningham et al., 2009; McMahan et al., 2019; Moats, 1994; Piasta et al., 2009)
- **Spelling content and pedagogical knowledge** (Pittman et al., 2023; Puliatte & Ehri, 2018)
- **Phonological awareness content and pedagogical knowledge** (e.g., Carroll et al., 2012; Crim et al., 2008; Cunningham et al., 2015)
- **Fluency** (Lane et al., 2009)

Sample Content Knowledge Items



Cunningham, Zibulsky, & Callahan (2009);
Meyer (2013); Puliatte & Ehri (2018)



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Does the word scratch contain a consonant blend? ☒ a. Yes ☐ b. No

Count the number of simple speech sounds you hear in each of the words below and circle the correct answer to the right of the word. Do this for each of the words listed.

Example: *Cat* has three sounds: /c/ /a/ /t/

grass
say

a. one sound
a. one sound

b. two
☒ b. two

c. three
c. three

☒ d. four
d. four

e. five
e. five

A word that is an example of the “y rule” for adding endings is (select one):

☒ easier

hoping

enjoyable

plowed

Which of these words is NOT a magic-e syllable (select one)?

time

☒ peace

hope

wage

drove

16. According to the ideals of sociocultural theory, teachers must _____ in their content area in order to teach literacy skills used by experts in that field (e.g. American history).

a. expose students to the literacy practices

b. thoroughly lecture about major concepts

☒ c. develop a learning community that uses the literacy practices

d. both a and b

Sample Pedagogical Knowledge Items (Knowledge for Practice)



Carlisle et al., (2011); Cunningham et al. (2015); Meyer (2013)



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30. You are trying to teach your preschool students to notice alliteration (similar beginning sounds in words such as with the spoken words *sun*, *city*, *sand*). Which instructional strategies below would be an effective way to help your students master *alliteration*? (Check all that apply)

- Use cards with pictures of things on one side and the letter that starts that thing on the other side (for example, F for fan, S for sun).
- Practice sorting pictures of objects according to their beginning sound.
- Have children find the letter "S" in words written in the classroom.
- Play "I Spy" and have the children find all the objects in the room that start with a certain sound.
- I don't know

43. A first-grade teacher is preparing a read-aloud lesson for her class. She is thinking about selecting four or five words from the story to discuss with the students. Which category of words below, if selected by the teacher, will most affect whether students will understand the story? (Mark (X) one)

- ☐ a. names of characters
- ☐ b. the words that are hardest to pronounce
- ☐ c. words that students will encounter in other texts
- ☐ d. specialized words in the story

13. If a middle or high school student has difficulty decoding words in textbooks, _____ is/are the best alternative.

- a. audio books on the topic
- b. less demanding text about the same topic
- c. a remedial reading class
- d. reading guides



(General)
pedagogical
knowledge



Knowledge of
learners
and their
characteristics

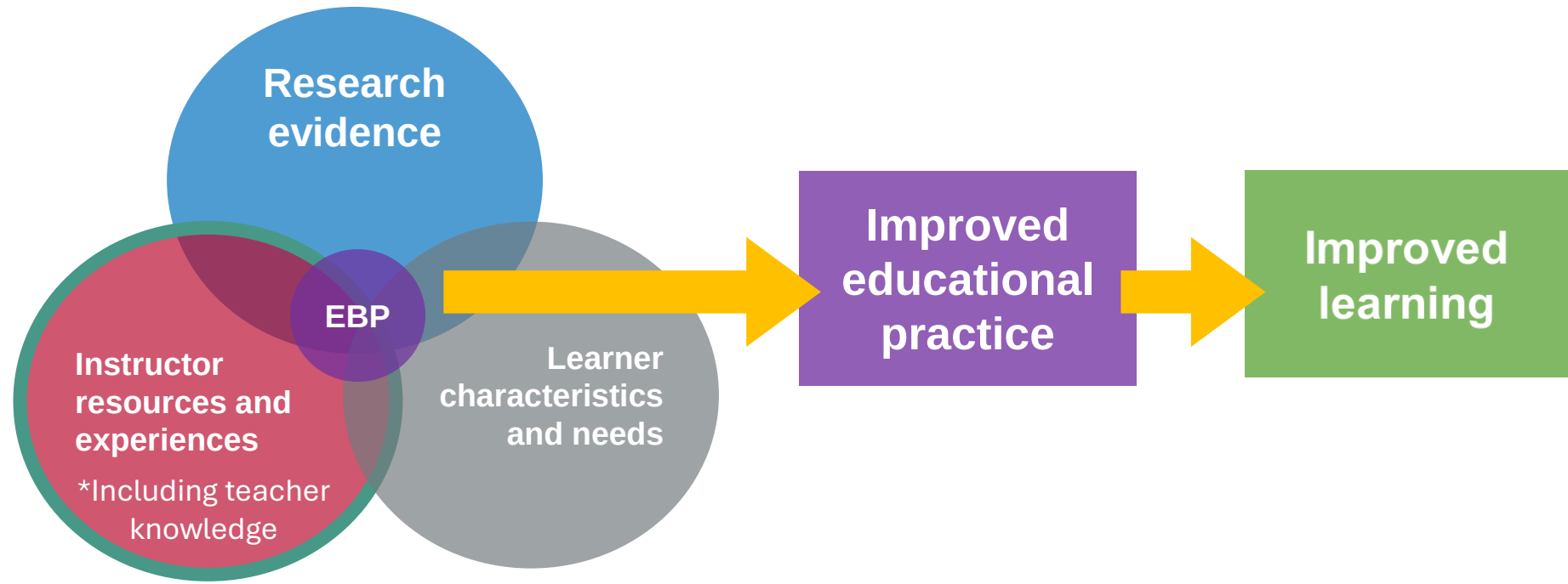
- **Knowledge of children's literature** (e.g., McCutchen et al., 2002)
- **Knowledge of RTI/MTSS** (e.g., Al Otaiba et al., 2019)
- **Knowledge to differentiate instruction** (Dack & Tomlinson, 2025)

- **Knowledge of and from literacy assessments & data-based decision making** (e.g., Beachy et al., 2023; Carson & Bayetto, 2018; McMaster et al., 2025)

- **Knowledge about dyslexia** (e.g., Gonzalez, 2021; Peltier et al., 2020; Reed & Zhang, 2024; Solheim et al., 2024)

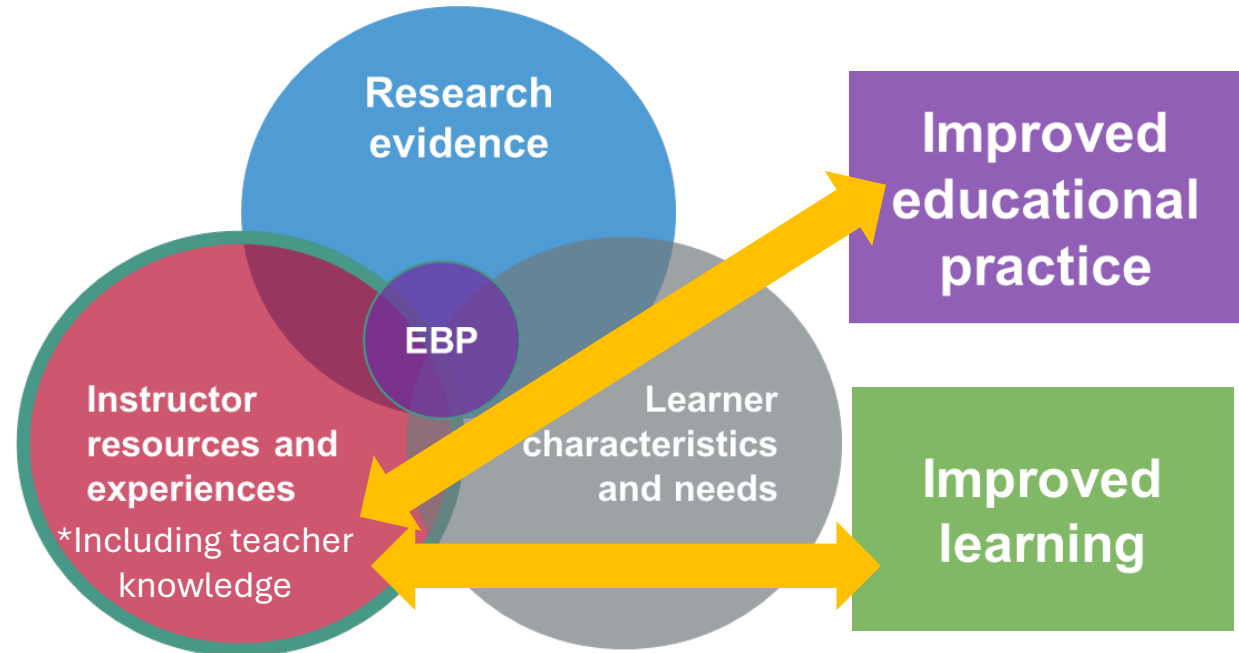


Causation

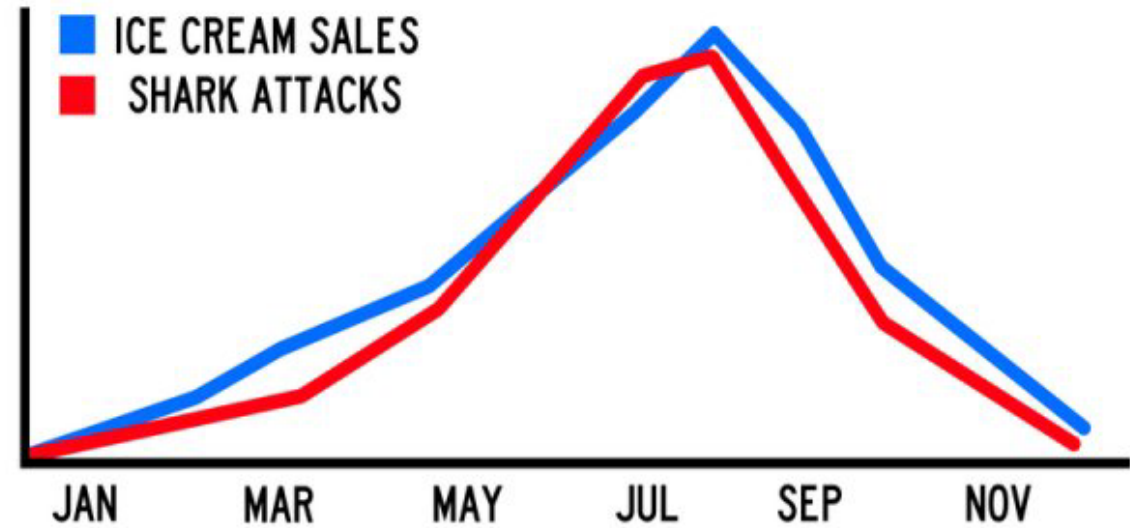


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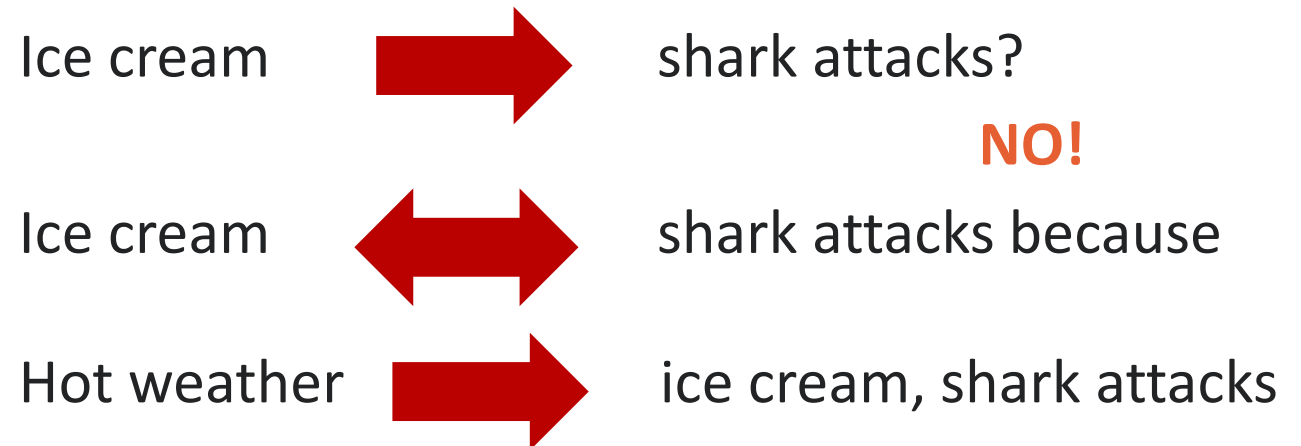
Correlation



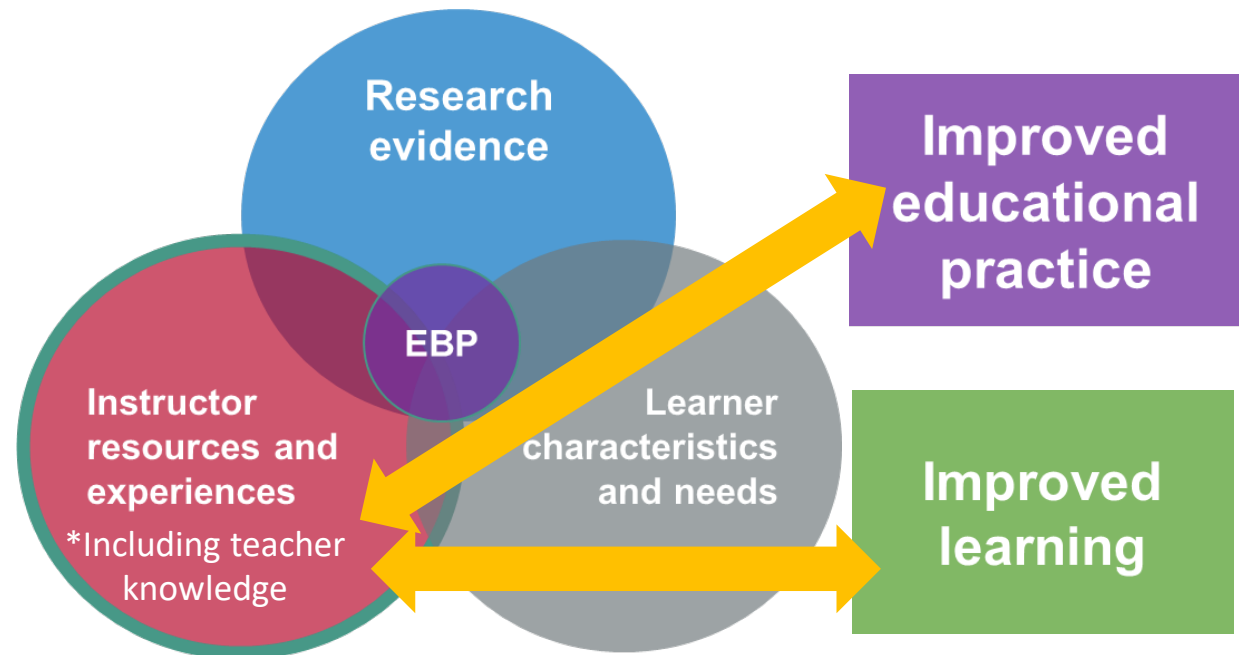
Causation versus correlation



Both ice cream sales and shark attacks increase when the weather is hot and sunny, but they are not caused by each other (they are caused by good weather, with lots of people at the beach, both eating ice cream and having a swim in the sea)



To what extent does knowledge relate to classroom practice and student learning?



To what extent does knowledge relate to classroom practice and student learning?

CORRELATIONAL EVIDENCE



Knowledge



Practice

- Positive association with observed general instructional quality in PK (Hindman & Wasik, 2011) and quality of literacy instruction in PK (Piasta, Soto Ramirez et al., 2020) and G1 (Parrila et al., 2024)
 - But not cognitive activation or constructive support during instruction in primary grades (König et al., 2022)
- Positive associations with
 - Reported time devoted to phonological awareness, letter knowledge, phonics instruction for K-G5 teachers (Spear-Swerling & Zibulsky, 2014)
 - Overall observed quantity of literacy instruction in PK (Piasta, Soto-Ramirez et al., 2020)
 - Observed explicit phonological awareness instruction in K (McCutchen, Harry et al., 2002)
 - Reported use of research-based spelling strategies for G2-3 teachers (Puliatte & Ehri, 2018)
- Reported use of strategies to comprehensively support literacy learning in K and G1 (Jordan & Bratsch-Hines, 2020)
- No association between reported or observed explicit word-level literacy instruction in primary grades (Arrow et al., 2019)
- Positive associations for PCK (but not CK) with reported language supports and general language quality of PK classrooms (Phillips et al., 2020; cf. Spear-Swerling et al., 2000)

To what extent does knowledge relate to classroom practice and student learning?

CORRELATIONAL EVIDENCE



Knowledge

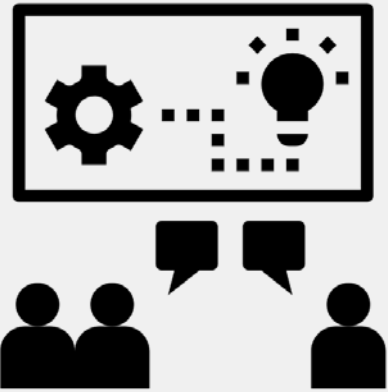


Learning

- Content knowledge positively associated with expressive vocabulary and print knowledge gains in PK (Cash et al., 2015)
- Knowledge for practice positively associated with oral reading fluency, word reading/decoding, vocabulary, and comprehension outcomes in G1 (Gersten et al., 2010; cf. Carlisle et al., 2011)
- Content knowledge positively associated with word decoding (Spear-Swerling & Brucker, 2004) and spelling gains (Puliatte & Ehri, 2018) in G2
- Content knowledge positively associated with reading in K-G1 (Porter et al., 2024) and G3-G4 (Foorman & Moats, 2004)
- Content and knowledge for practice regarding reading fluency predicted 25% of the variance in G1-G2 student fluency growth (Lane et al., 2009)
- Content knowledge *not* associated with word reading/decoding or comprehension in G1-G3 (Carlisle et al., 2009; see also Piasta et al., 2009, Parrila et al., 2024)

Does professional learning impact knowledge?

CAUSAL EVIDENCE



Preservice PL



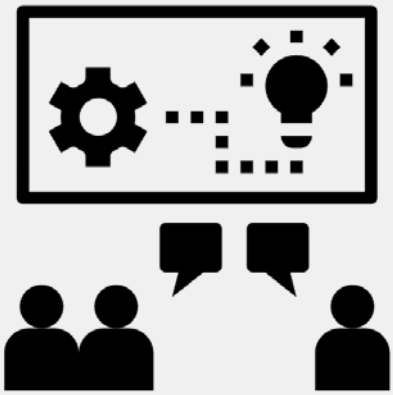
Knowledge

- Synthesis of 12 quality exp/QED studies (Hudson et al., 2021)
 - Phonological awareness: $g = 0.33-1.65$
 - Phonics knowledge: $g = 0.07-55.32$
 - Morphological awareness: $g = 0.25-1.20$
- Meta-analysis of 21 exp/QED studies (Raines et al., 2025)
 - $g = 1.44$
- Integrative review of 27 studies of teacher prep for code-related instruction (Tortorelli et al., 2021)
 - Mostly focused on content knowledge
 - Positive effects of explicit instruction via live classroom lectures, multimedia modules, tutoring or student teaching experiences



Does professional learning impact knowledge?

CAUSAL EVIDENCE



Inservice PL



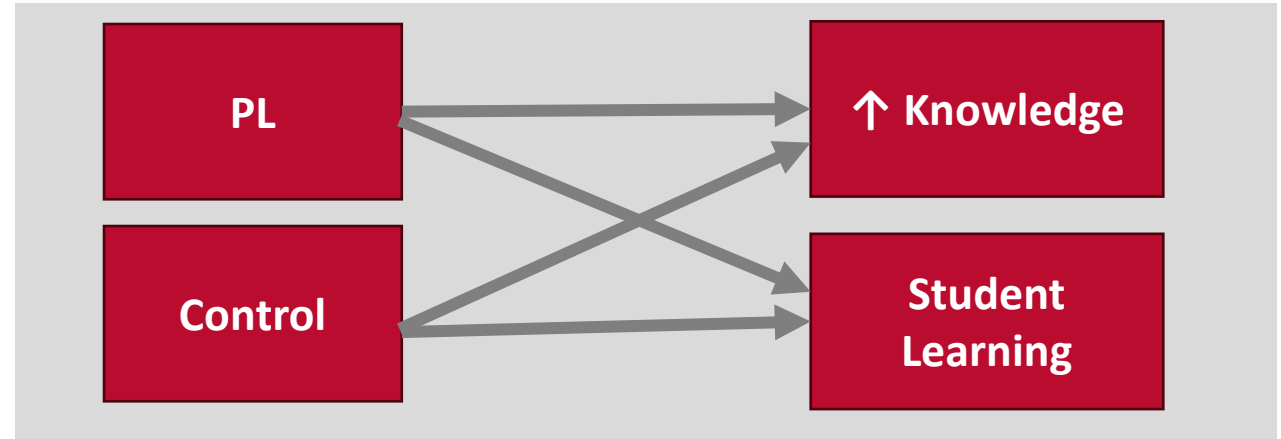
Knowledge

- Meta-analysis of 11 studies of preschool teacher PL on their knowledge (Markussen-Brown et al., 2017)
 - $g = 0.12$ ns
- Meta-analysis of 20 studies of reading comprehension PL on K-12 teachers' knowledge and practice (Rice et al., 2024)
 - $g = 0.95$
 - 7 with knowledge outcomes $g = 0.25$ -2.08
- Range of null to large effects in individual studies (e.g., Donovan et al., 2022; Goldfeld et al., 2020; Magidin de Dramer; Neuman & Cunningham, 2009; Piasta, Farley et al., 2020; Sayeski et al., 2015)
 - Courses, workshops, coaching, online modules



To what extent does knowledge impact student learning?

CAUSAL EVIDENCE



- Synthesis of 12 quality exp/QED studies (Hudson et al., 2021)
 - Word reading $g = 0.00-1.66$
 - Reading fluency $g = 0.15-0.62$
- RCT that positively impacted G6-G7 teacher reading comprehension knowledge (Wexler et al, 2022)
 - No statistically significant effects on students' reading comprehension
 - Only study in Rice et al. (2024) meta-analysis that had positive effects on teacher knowledge and measured student learning
- RCT that positively impacted K-G2 teachers literacy/language knowledge (Goldfeld et al., 2020) did not show effects on student reading, writing, or language outcomes (Goldfeld et al., 2022)



Teachers' Knowledge to Support Literacy Learning and Related Research



thank you!

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What should teachers know?

- PC, PCK, PK, Knowledge of learners; PC and PCK based on SVR/NSVW



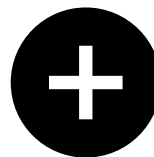
To what extent does knowledge relate to/impact classroom practice and student learning?

- Available correlational evidence suggests positive associations with practice and potential associations with student learning
- Mixed evidence for causal effects on student learning
- May need to take knowledge and practice into account



Does professional learning impact knowledge?

- Potential positive effects for various formats
- Likely depends on the content, format, and quality of the PL



More attention to PCK knowledge, its relations with practice/learning, and effects of professional learning; knowledge for supporting language, comprehension, and writing