The Science of Teaching Writing

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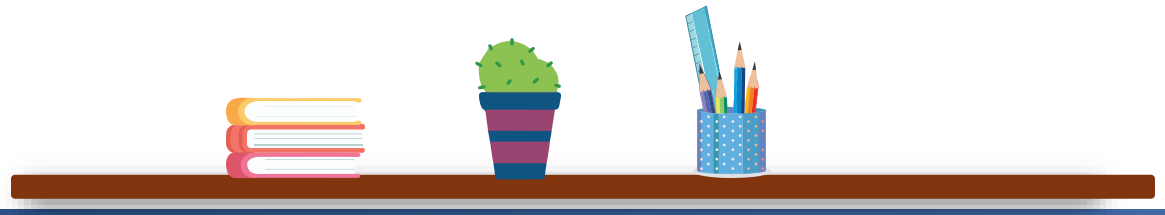
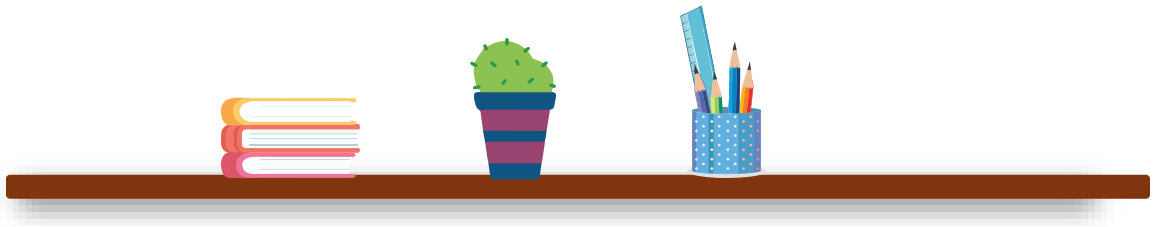


Agenda

- Writing development
- Skills & knowledge for writing development (theoretical model)
- Effective instructional approaches
  - What & How

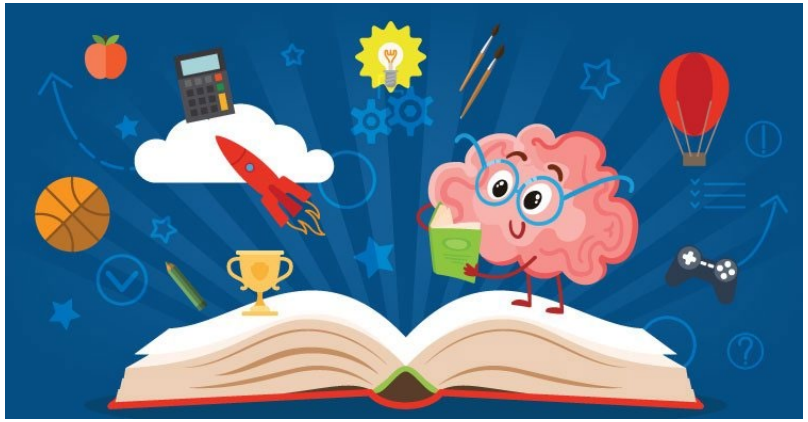


Science of Writing

a body of scientific research on writing development, factors influencing writing development, and evidence-based best practices that promote individuals' writing development

Science of Writing

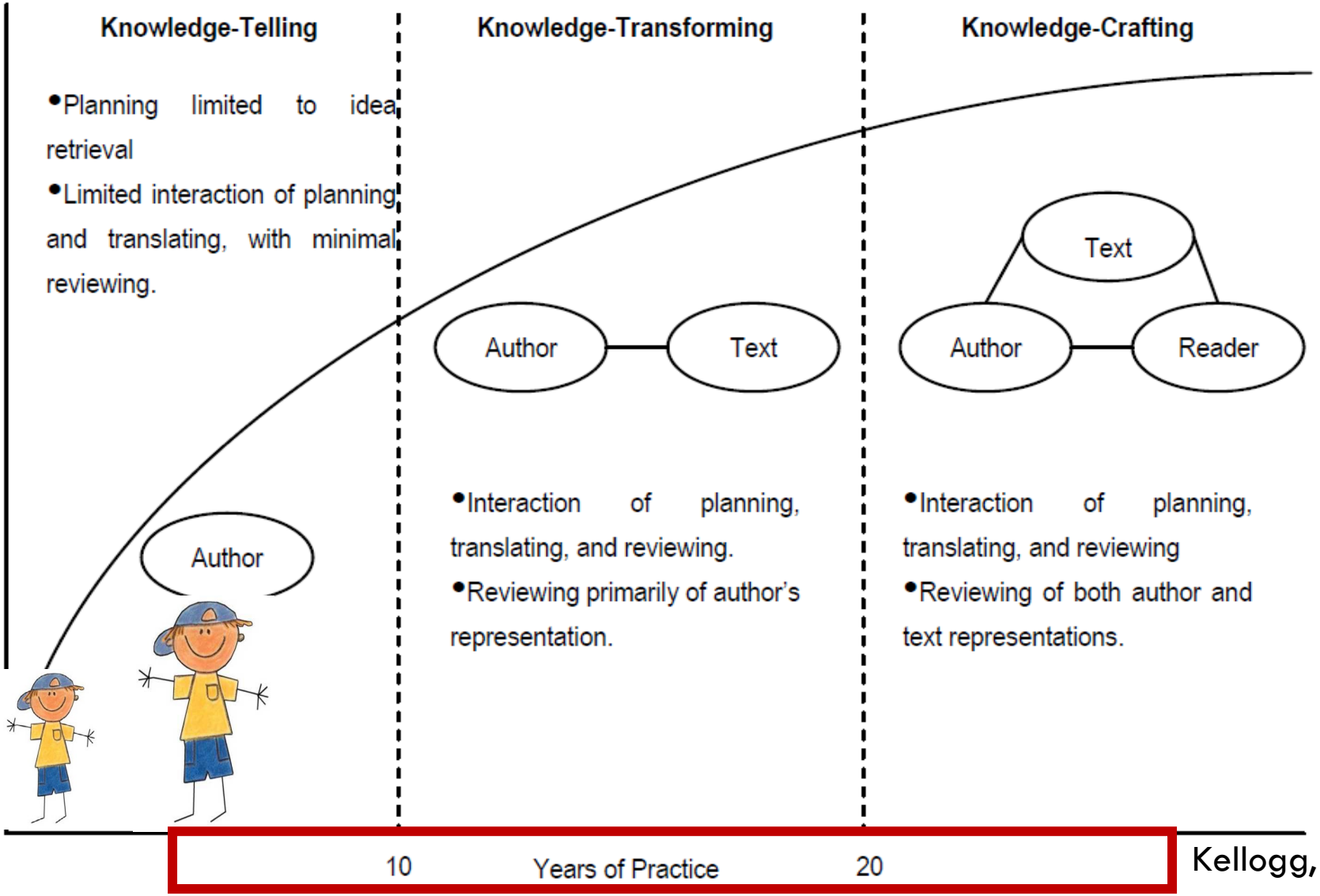
- Where is your district and school with regard to writing or Science of Writing?



Power of Writing

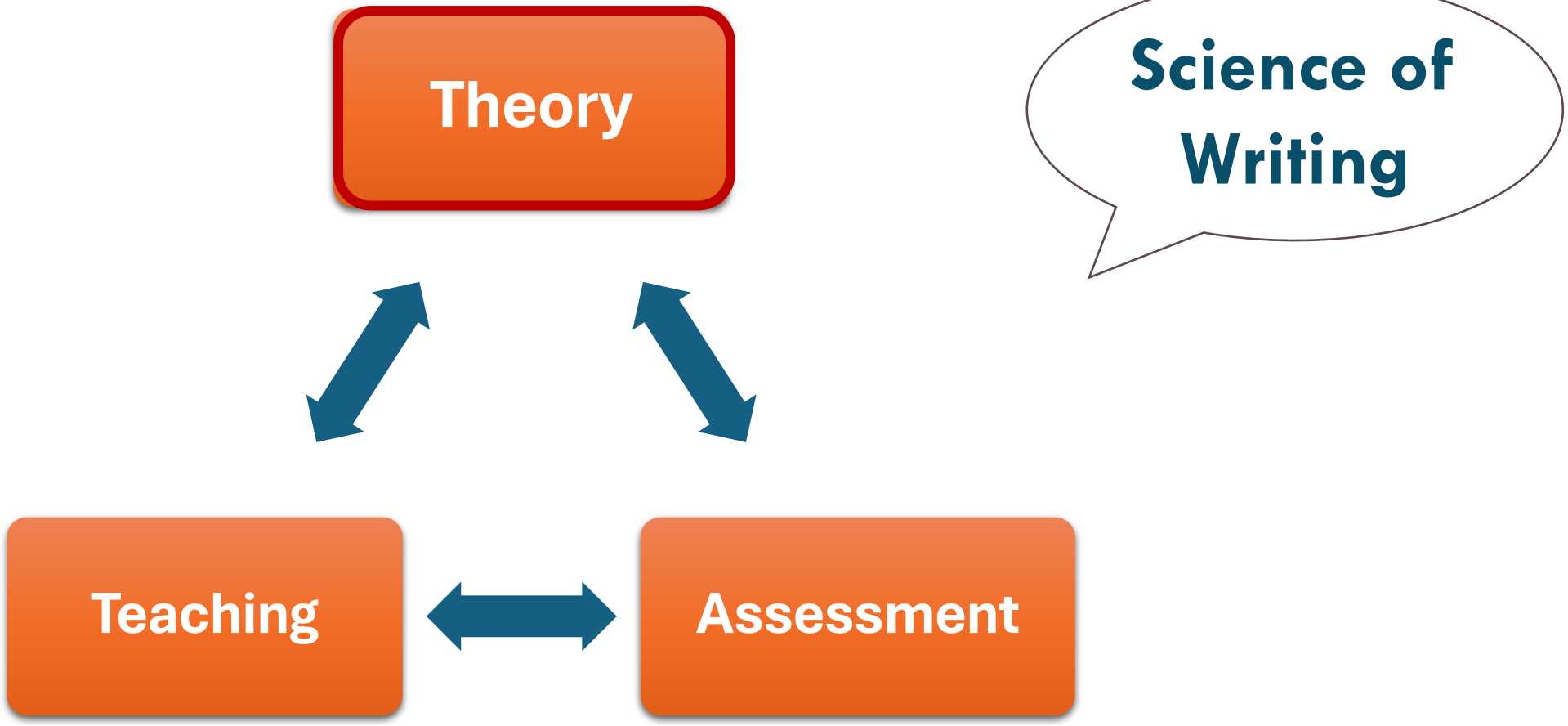
- Means of expression and thinking
- Essential for academic achievement and at workplace
- **Support reading development**

Writing Development is a Long Journey!



Kellogg, 2008

Three Elements



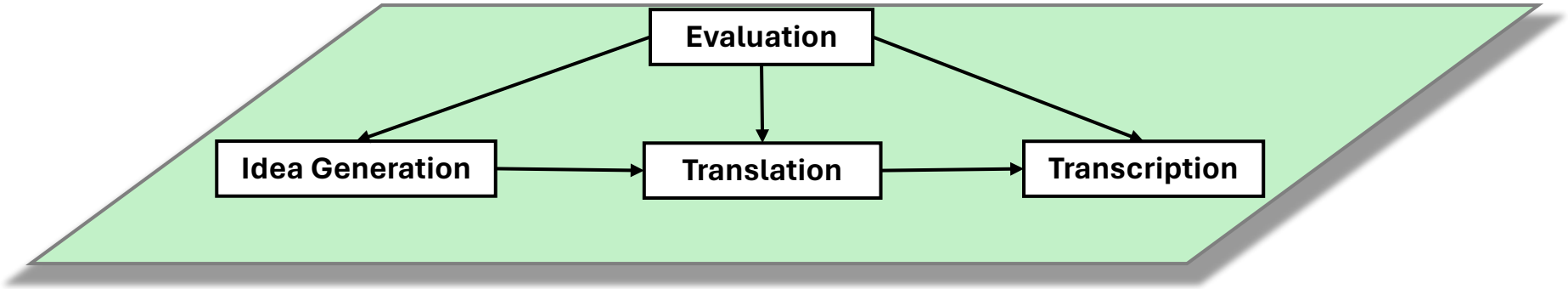
Summer Plan

Write about your summer plan on a piece of paper.

Reflect on the **processes** of writing.

Writing: Process & Skills

Writing Process



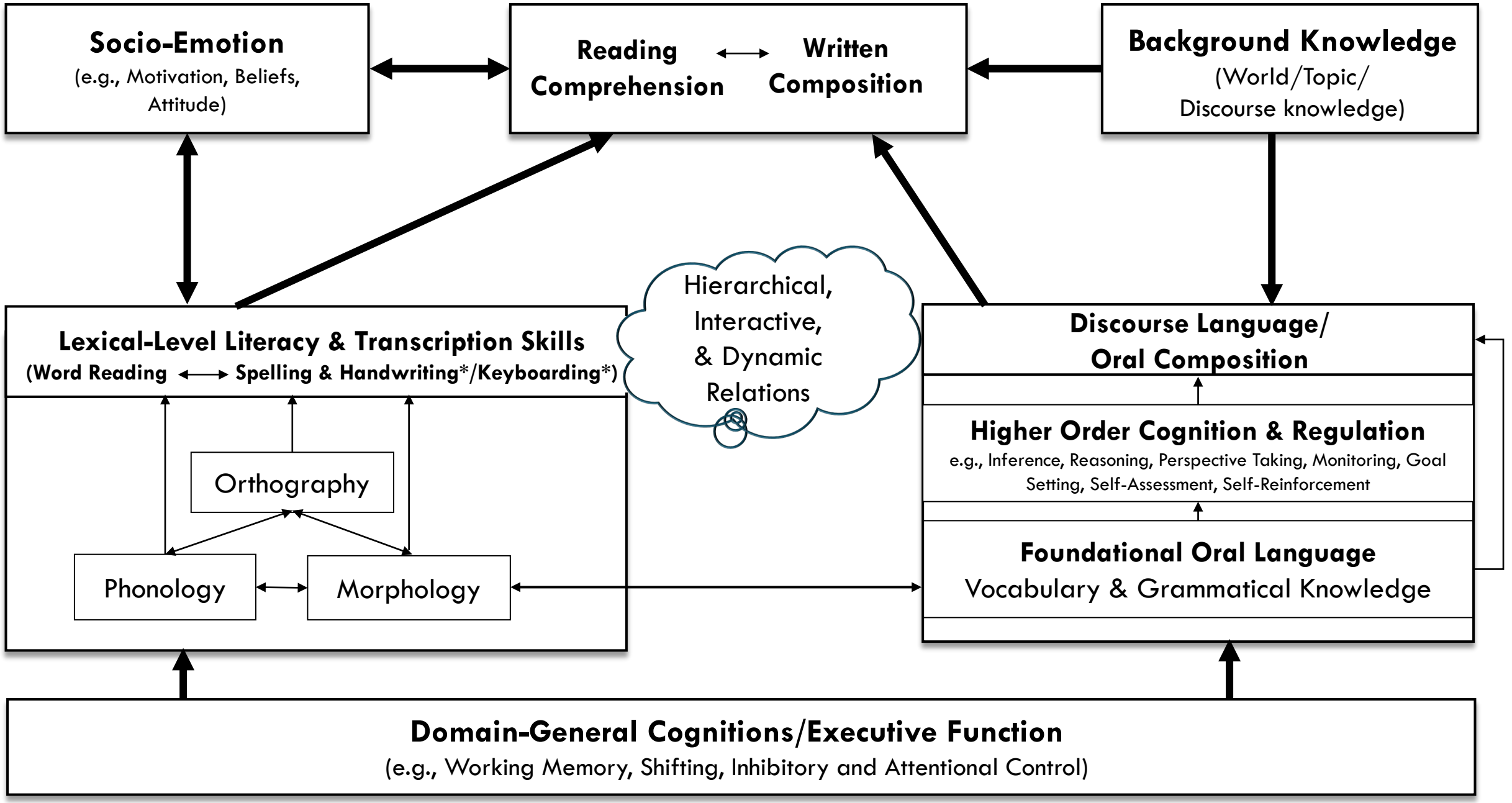
skills and knowledge you drew on for the writing process?

Theoretical Models

- Hayes and Flower model (Hayes & Flower, 1980) & Knowledge Telling and Transforming model (Bereiter & Scardamalia, 1987)
- Not-so-simple View of Writing (Berninger & Winn, 2006)
- Writer(s)-Within-Community Model (Graham, 2018)
- Direct and Indirect Effects Model of Writing (DIEW; Kim, 2020a; Kim & Graham, 2022; Kim & Park, 2019; Kim & Schatschneider, 2017)

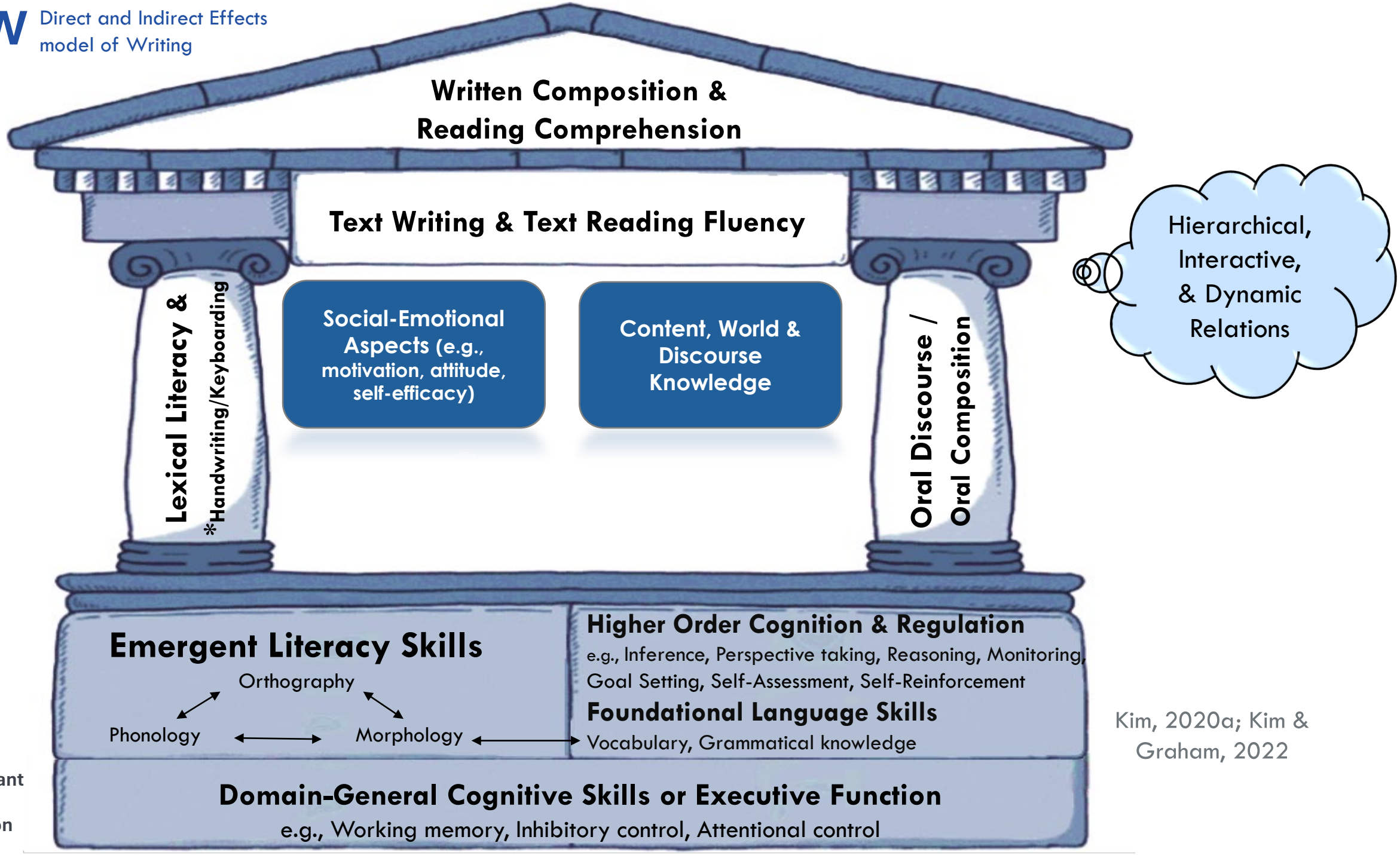
DIEW

Kim, 2020a; Kim & Graham, 2022; Kim & Park, 2019



*only relevant to written composition

DIEW Direct and Indirect Effects model of Writing



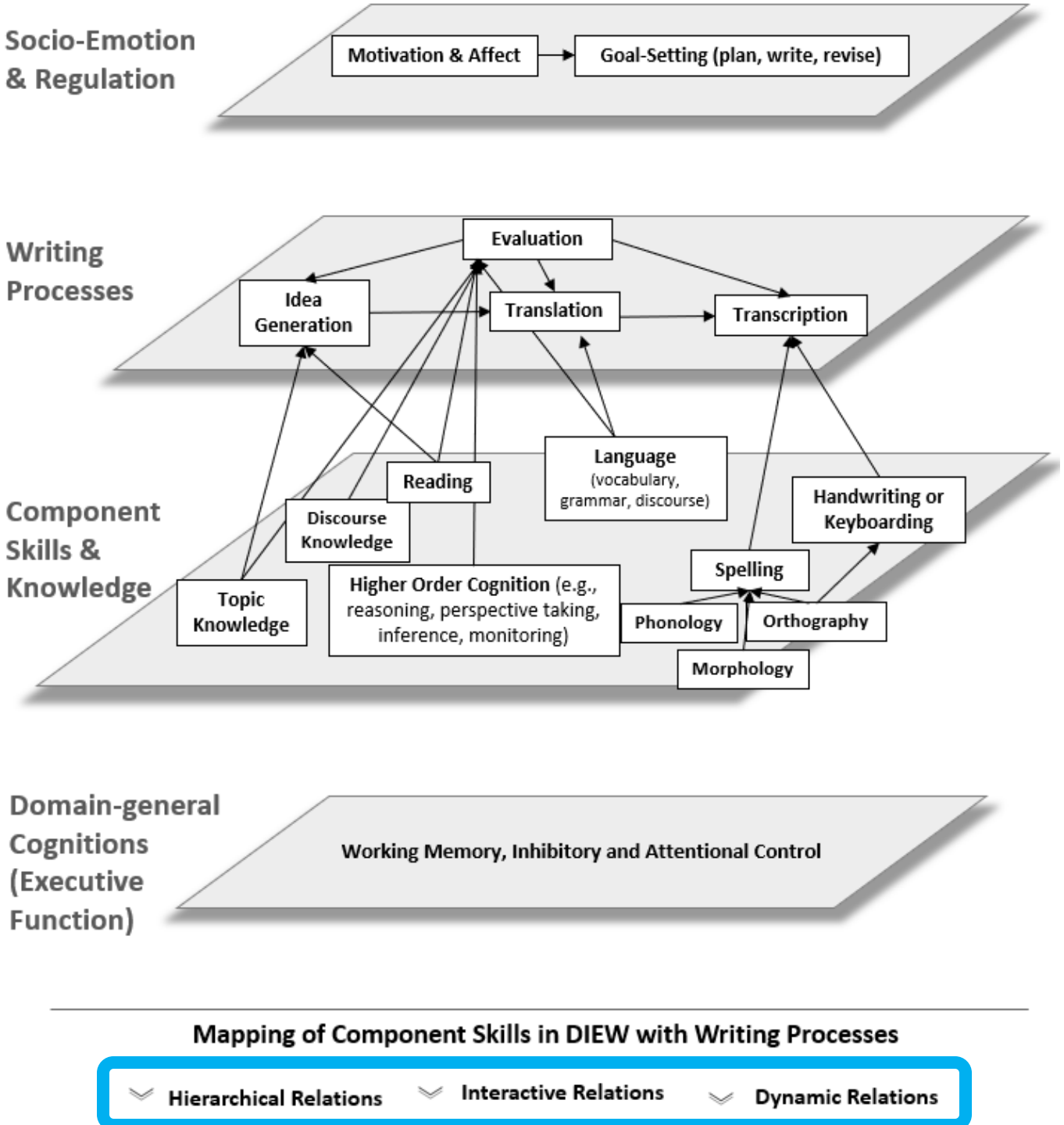
Hierarchical, Interactive, & Dynamic Relations

Kim, 2020a; Kim & Graham, 2022

*only relevant to written composition

DIEW

Direct and Indirect Effects model of Writing

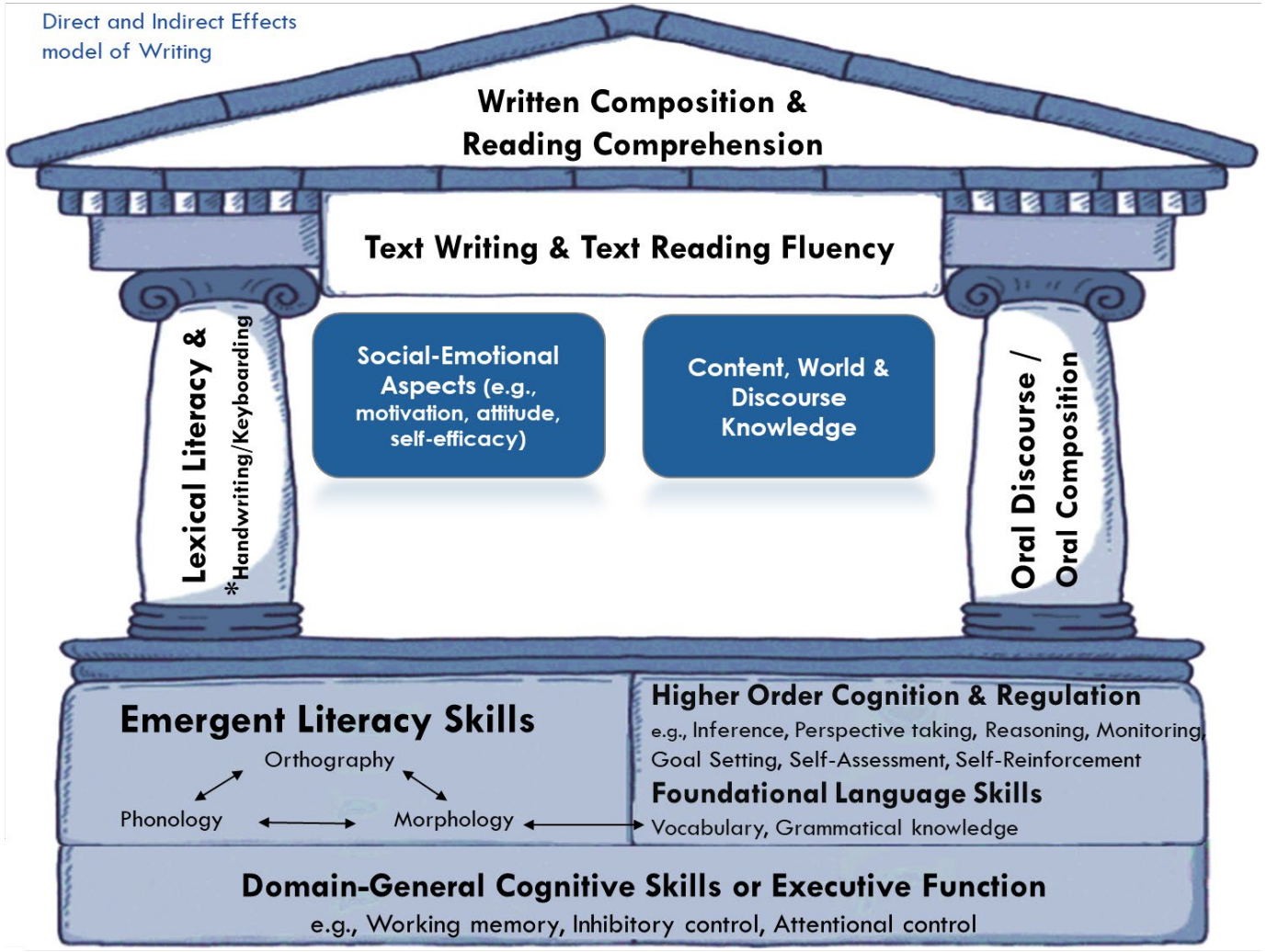


Mapping of Component Skills in DIEW with Writing Processes

Hierarchical Relations Interactive Relations Dynamic Relations

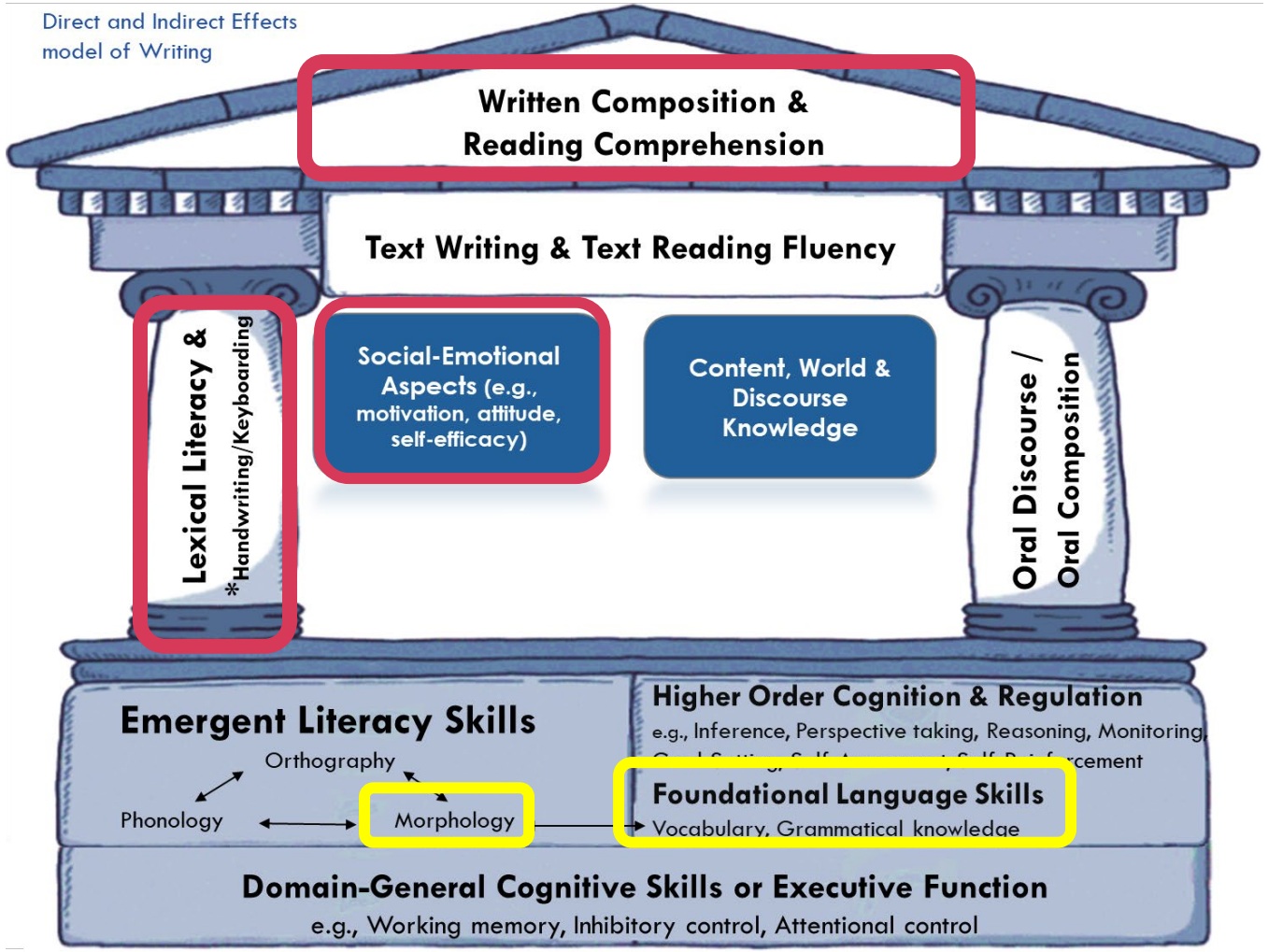
Kim & Graham, 2022

Hierarchical Relations



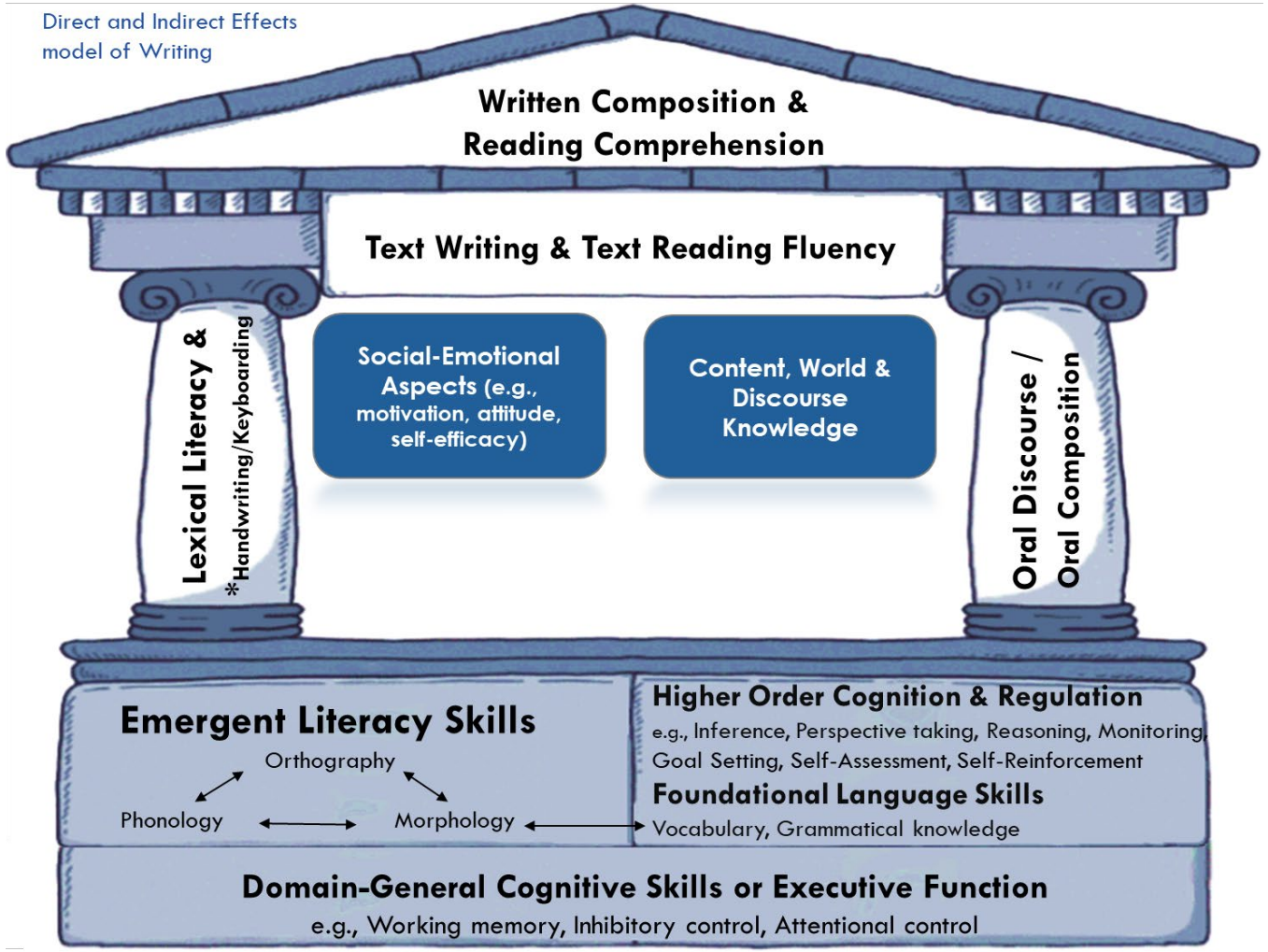
- Lower order skills are necessary and are the foundations for higher order skills—skills build on each other
- Difficulties in low order skills cause a chain of influences.
- Specifies direct and indirect (mediated) effects.

Interactive Relations



- Skills develop *bidirectionally*, mediated by learning experiences.
- Virtuous or vicious cycle

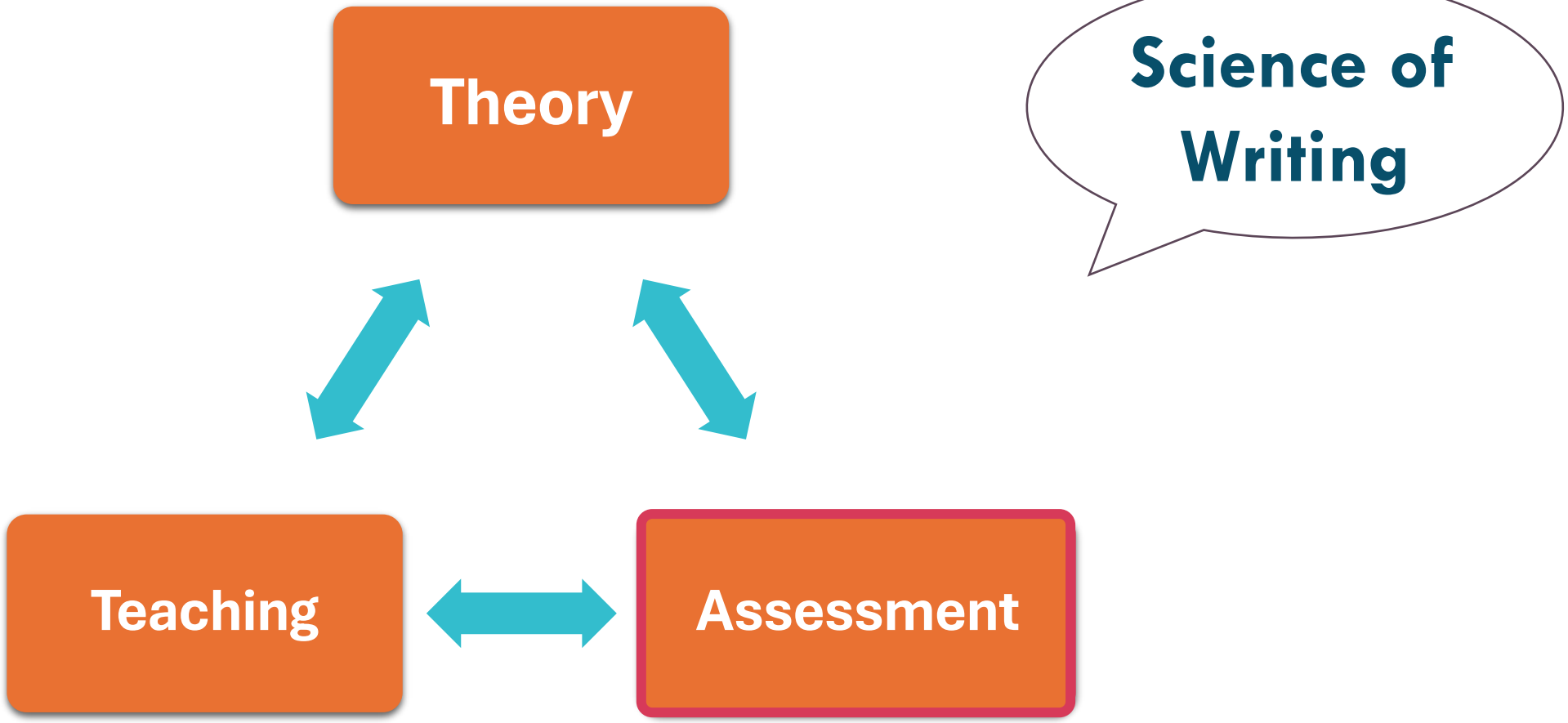
Dynamic Relations



Differential contributions due to

- **Development**
  - in the beginning phase: large constraining role of transcription skills
- **Measurement**
  - E.g., What you are looking for in writing

Three Elements



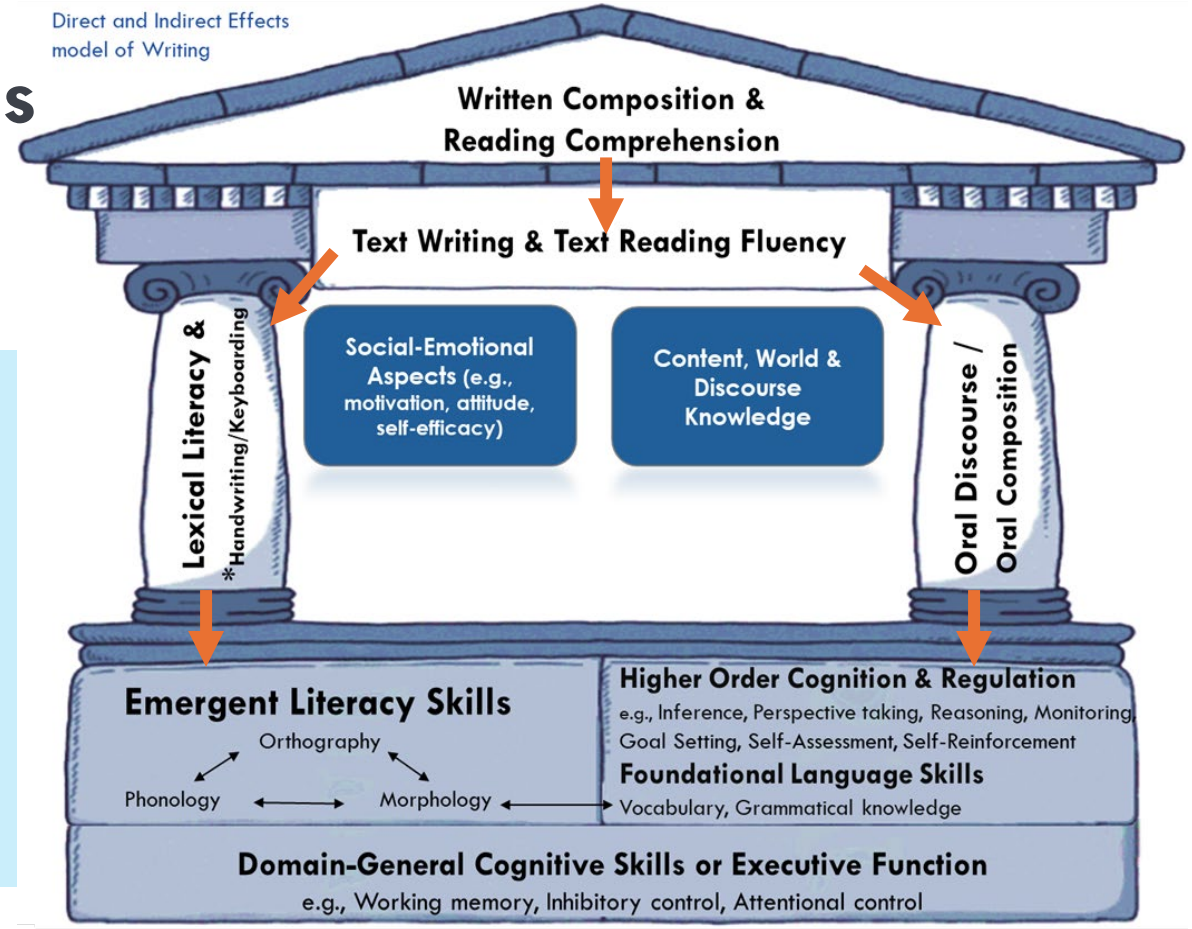
What & How to Assess

Hierarchical relations hypothesis

- Systematic approach

Goals/purposes

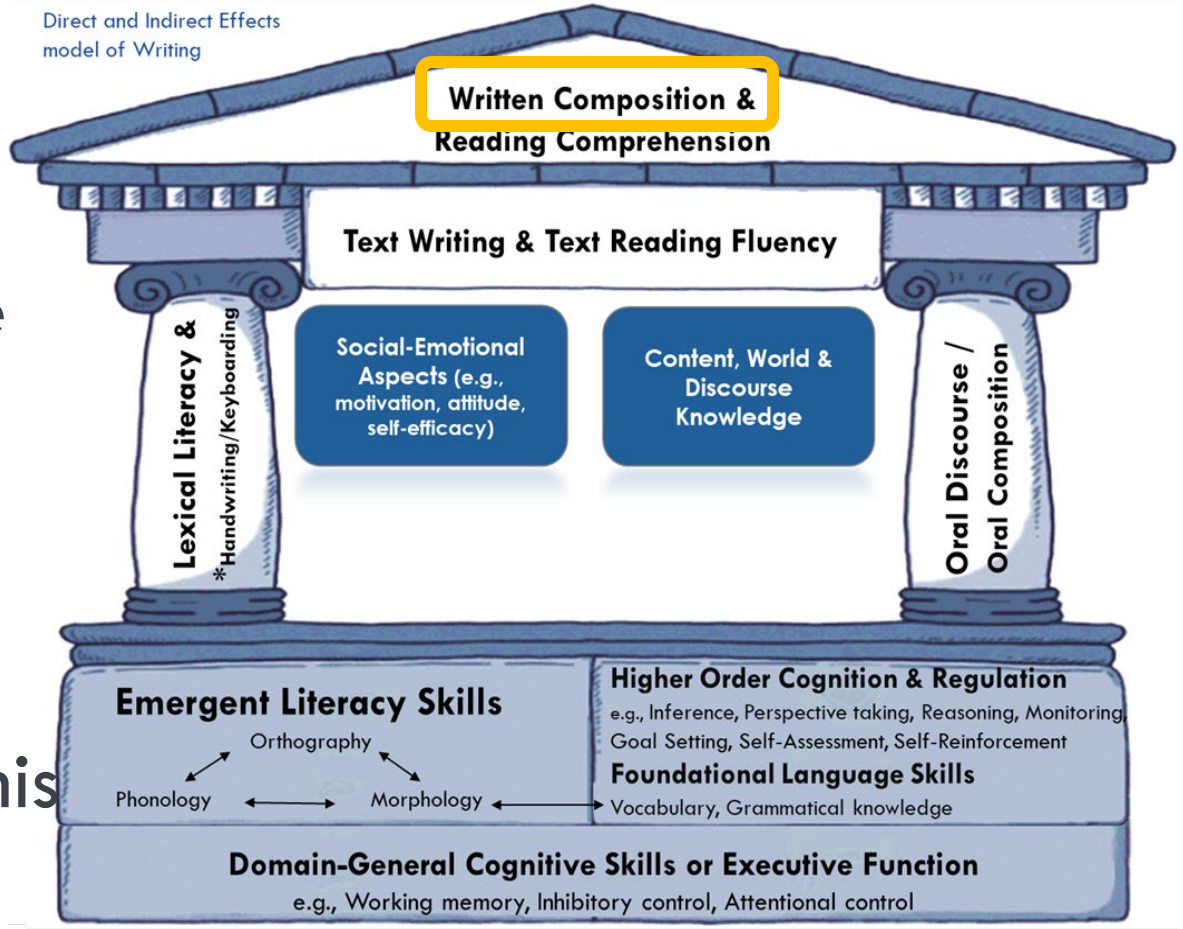
- Summative
- Formative: Screening, progress monitoring, benchmark; diagnostic



How to Assess

Dynamic relations: Composition

- Genre & Tasks
  - Large prompt effects
  - Include multiple genres & multiple tasks (e.g., Kim et al., 2017; Schoonen, 2012; Swartz et al., 1999)
- Writing Evaluation
  - Be familiar with writing rubric (different dimensions and make this known to students)
  - Be consistent in your evaluation



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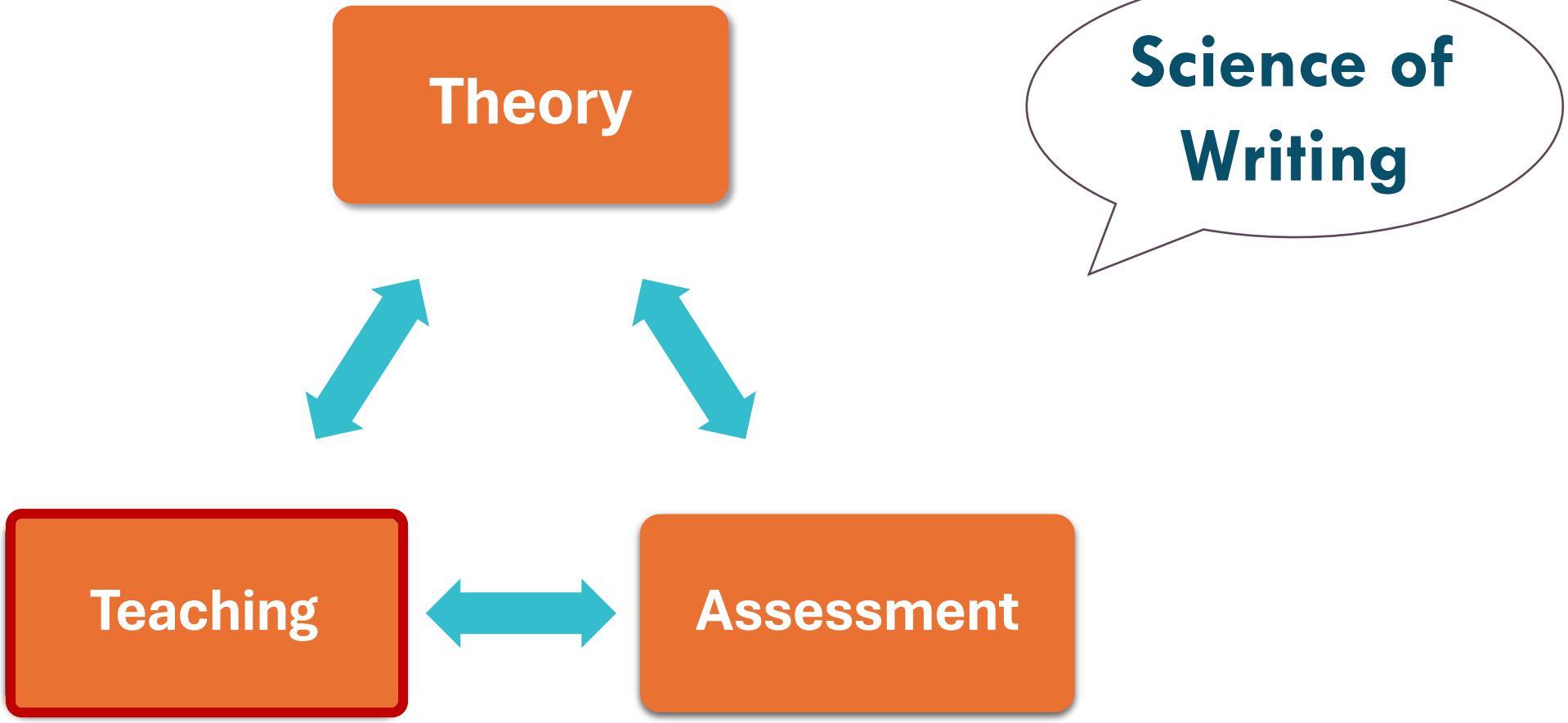
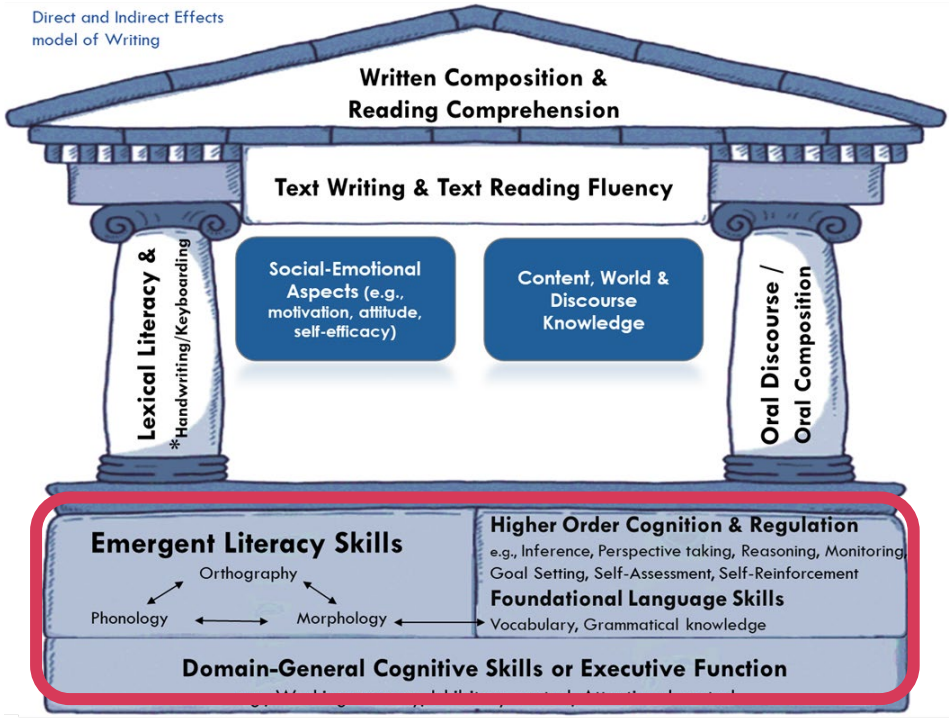


When to Teach

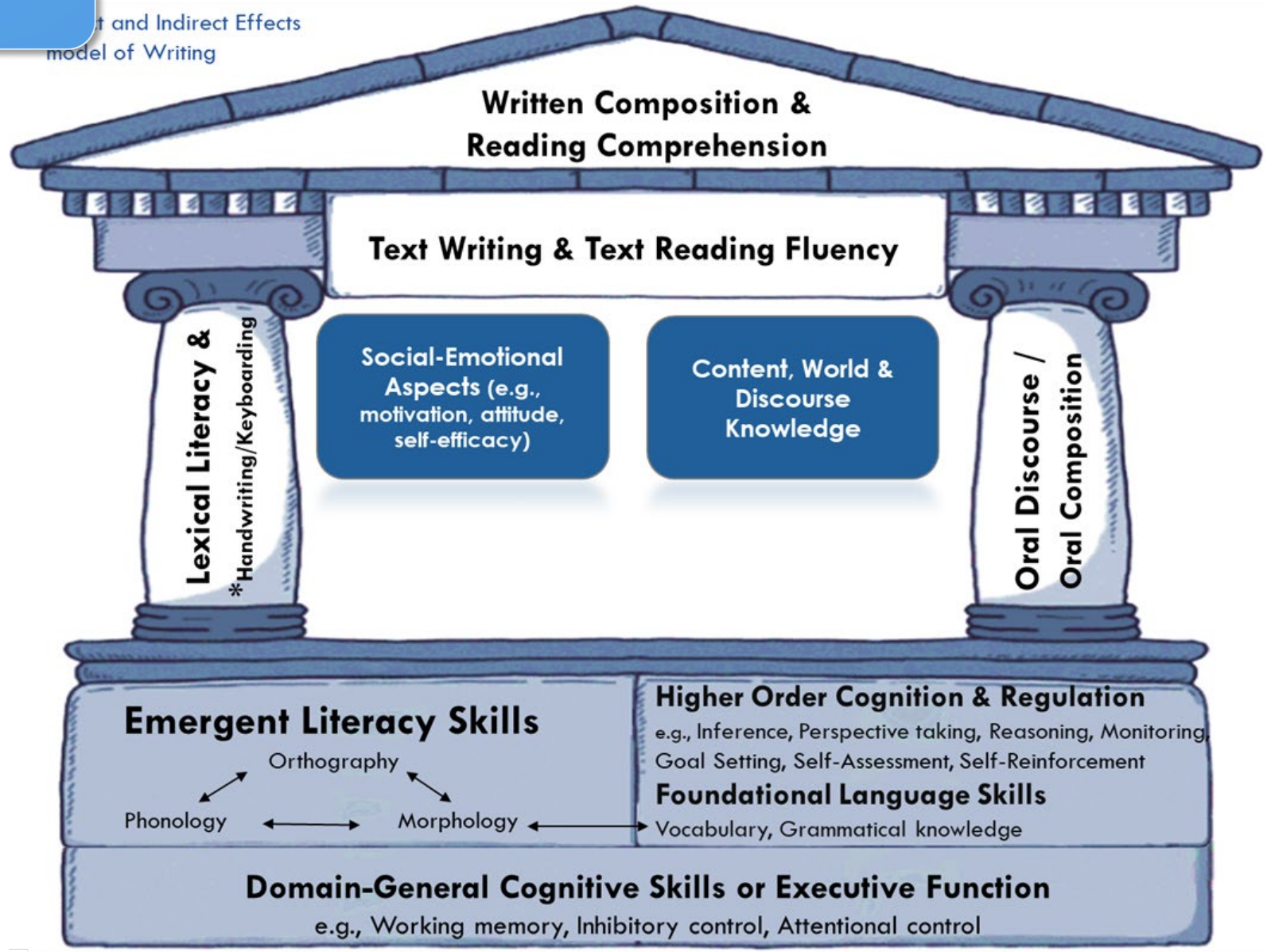
- **Start early:** Hierarchical relations hypothesis – skills and knowledge build on other skills
  - Do not wait until children develop transcription skills.
  - Teach foundational skills such as language skills, transcription skills, thinking skills (higher order cognition)
  - **Prevention** of reading and writing difficulties



Effective Writing Instruction

1. **Multi**component, systemic, & sustained instruction
2. Multiple genres and tasks (purposes)
3. Writing process
   - Setting goals, planning, revising, and associated strategies (e.g., tapping prior knowledge, monitoring, summarizing, asking questions)
4. Integrate with reading instruction

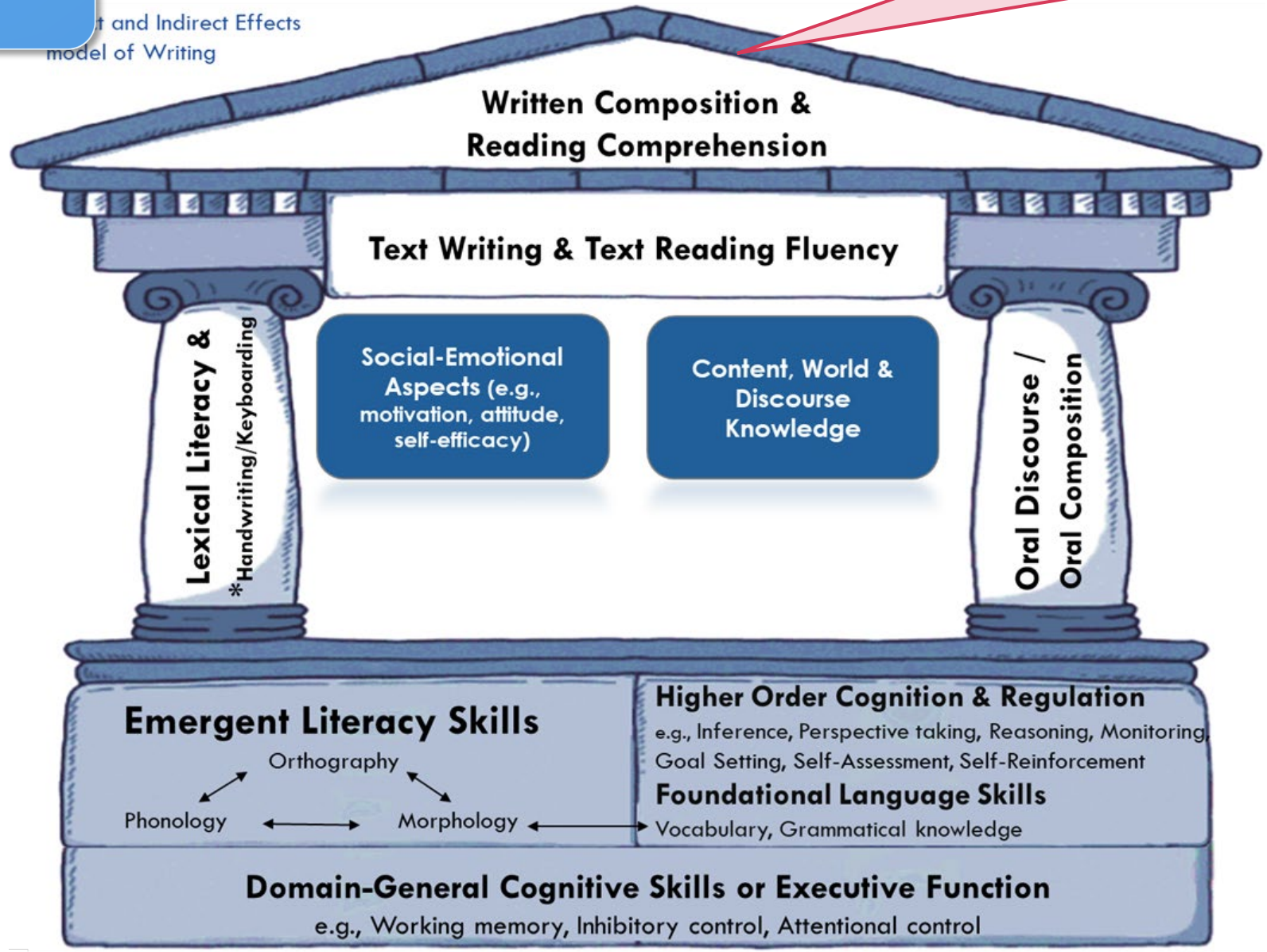
Effective Writing Instruction



DIEW (Direct & Indirect Effects Model of Writing, Kim, 2020; Kim & Graham, 2022; Kim & Park, 2019; Kim & Schatschneider, 2017)

Effective Writing Instruction

Comprehensive writing programs: .42
(Graham et al., 2012)



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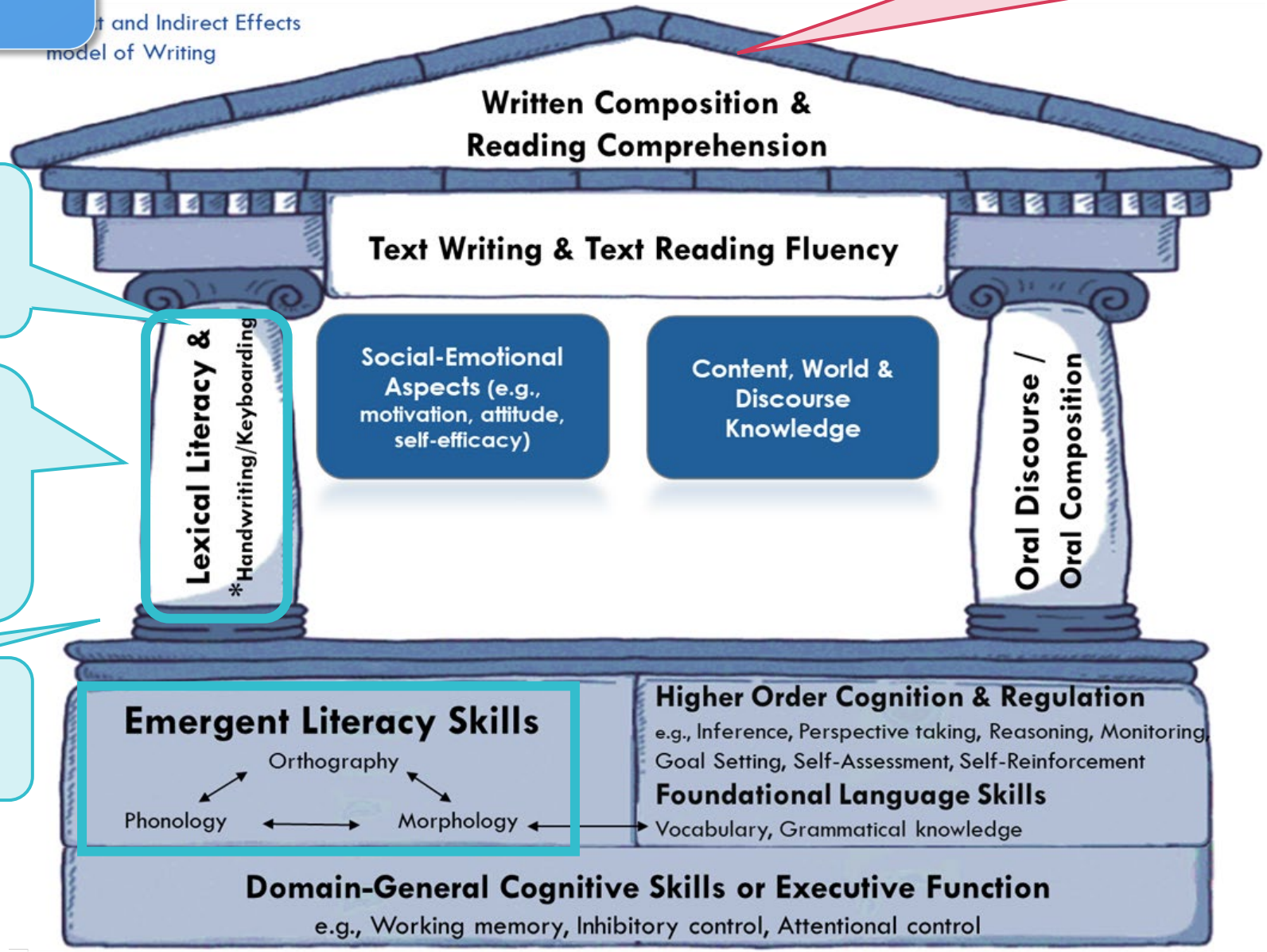
Effective Writing Instruction

Comprehensive writing programs: .42
(Graham et al., 2012)

Spelling Instruction: .94 for spelling in writing (Graham & Santangelo, 2014, but see Kim et al., 2021)

Handwriting instruction (.84 for quality; 1.33 for productivity; .48 for fluency) (Santangelo & Graham, 2016)
Word Processing (Graham et al., 2012; Graham & Perin, 2007)

More effective when **combined with composing** (Berninger et al., 2002).



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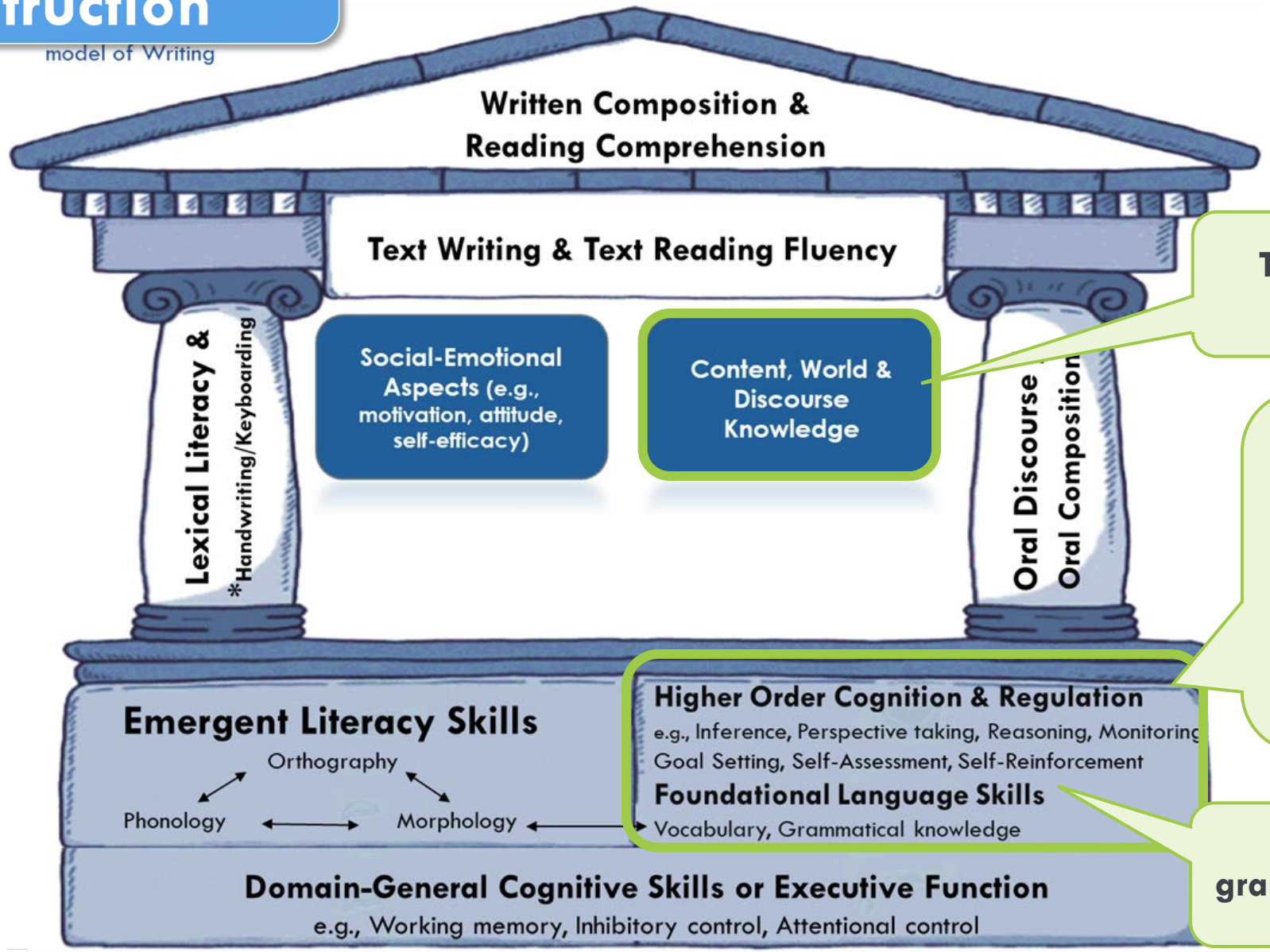
Effective Writing Instruction



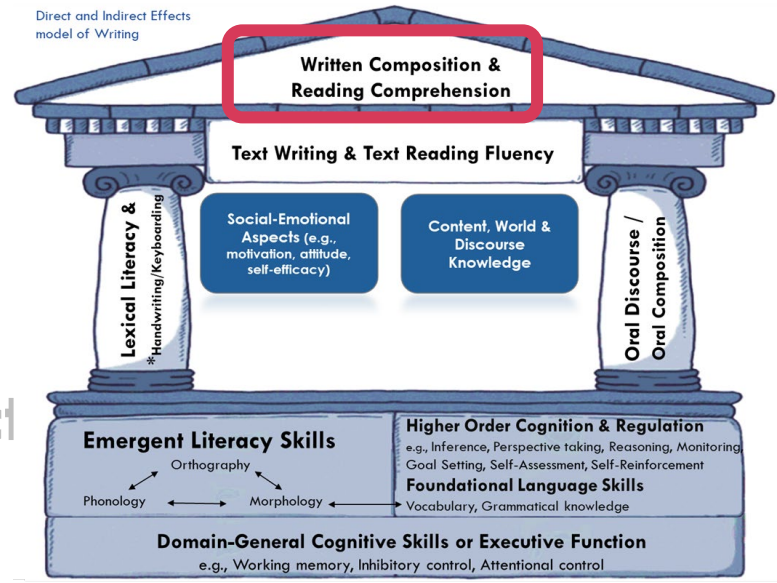
Text structure (.59; Graham et al., 2012)

- **Writing strategies (.82 to 1.02)**
- **Self-regulation strategies: Setting goals (.76) & Monitoring & self-assessment; corrective actions** (e.g., **SRSD**; Graham et al., 2012; Graham & Perin, 2007)

Sentence instruction (.73), grammar instruction (.77 Graham, Kim et al., 2023)

DIEW (Direct & Indirect Effects Model of Writing, Kim, 2020; Kim & Graham, 2022; Kim & Park, 2019; Kim & Schatschneider, 2017)

Effective Writing Instruction

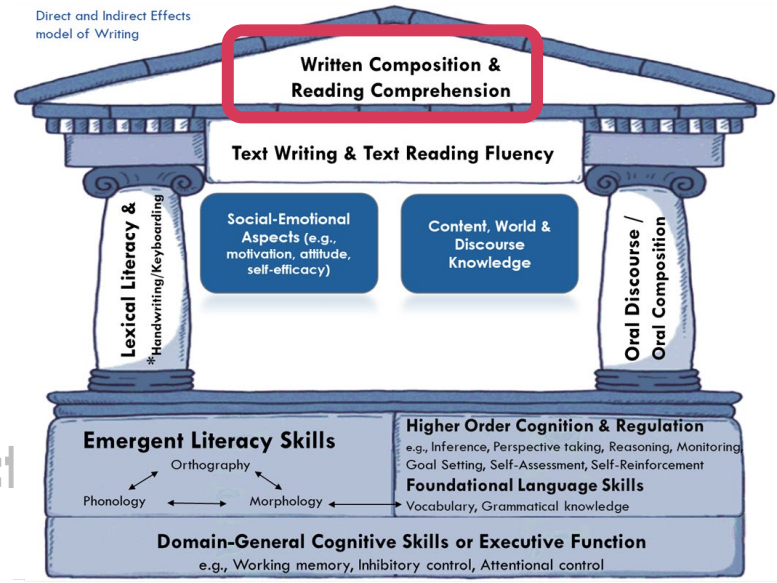


1. Multicomponent, systemic, & sustained instruct

2. **Multiple genres and tasks**
   - Narrative & informational (subgenres)
     - Genre-specific aspects (e.g., text structure, expression)
   - Types of tasks:
     - Source-based writing & nonsource-based
     - Different goals and forms
       - e.g., stories, reports, letters, note-taking

3. Writing process
   - Setting goals, planning, revising, and associated strategies (e.g., tapping

Effective Writing Instruction



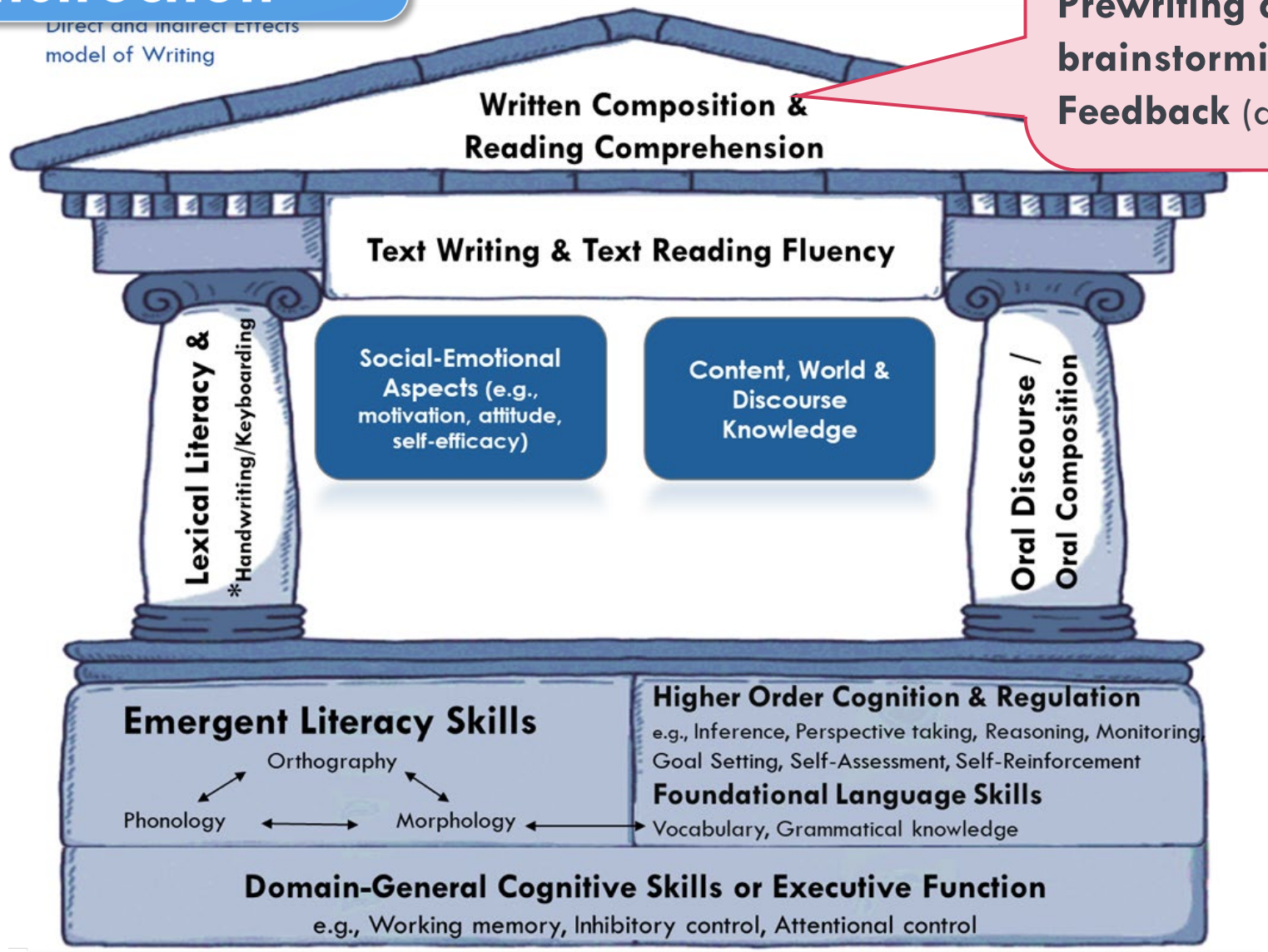
1. Multicomponent, systemic, & sustained instruct
2. Multiple genres and tasks (purposes)
3. **Writing process**
   - Planning, first draft, revising; and associated strategies (e.g., setting goals, tapping prior knowledge, monitoring, summarizing, asking questions)
4. Integrate with reading instruction

Effective Writing Instruction

Writing Process: .40 (Graham et al., 2012) & .32 (Graham & Perin, 2007)

Prewriting activities (semantic maps, brainstorming; .54)

Feedback (adults, peers, or self) (Graham et al., 2012)



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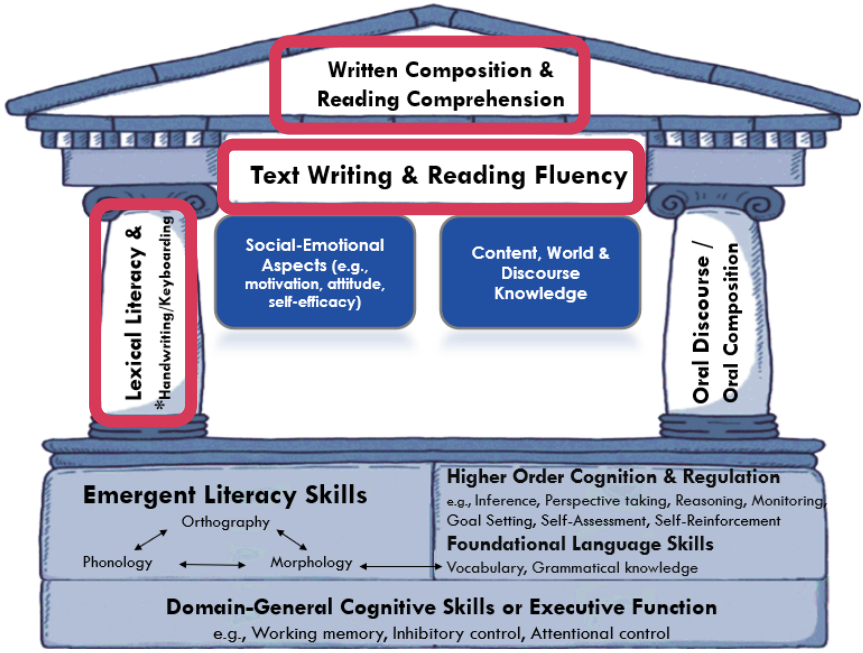
Effective Writing Instruction



1. **Multicomponent, coherent, & sustained instruction**
2. **Multiple genres and tasks (purposes)**
   - Narrative & informational (subgenres)
     - Genre-specific aspects (e.g., text structure, expression)
   - Source-based writing & nonsource-based
     - e.g., stories, reports, letters, note-taking
3. **Writing process**
   - Setting goals, planning, revising, and associated strategies (e.g., tapping prior knowledge, monitoring, summarizing, asking questions)

4. Integrate with reading instruction (Kim, 2020b, 2022a, b; Kim et al., 2023)

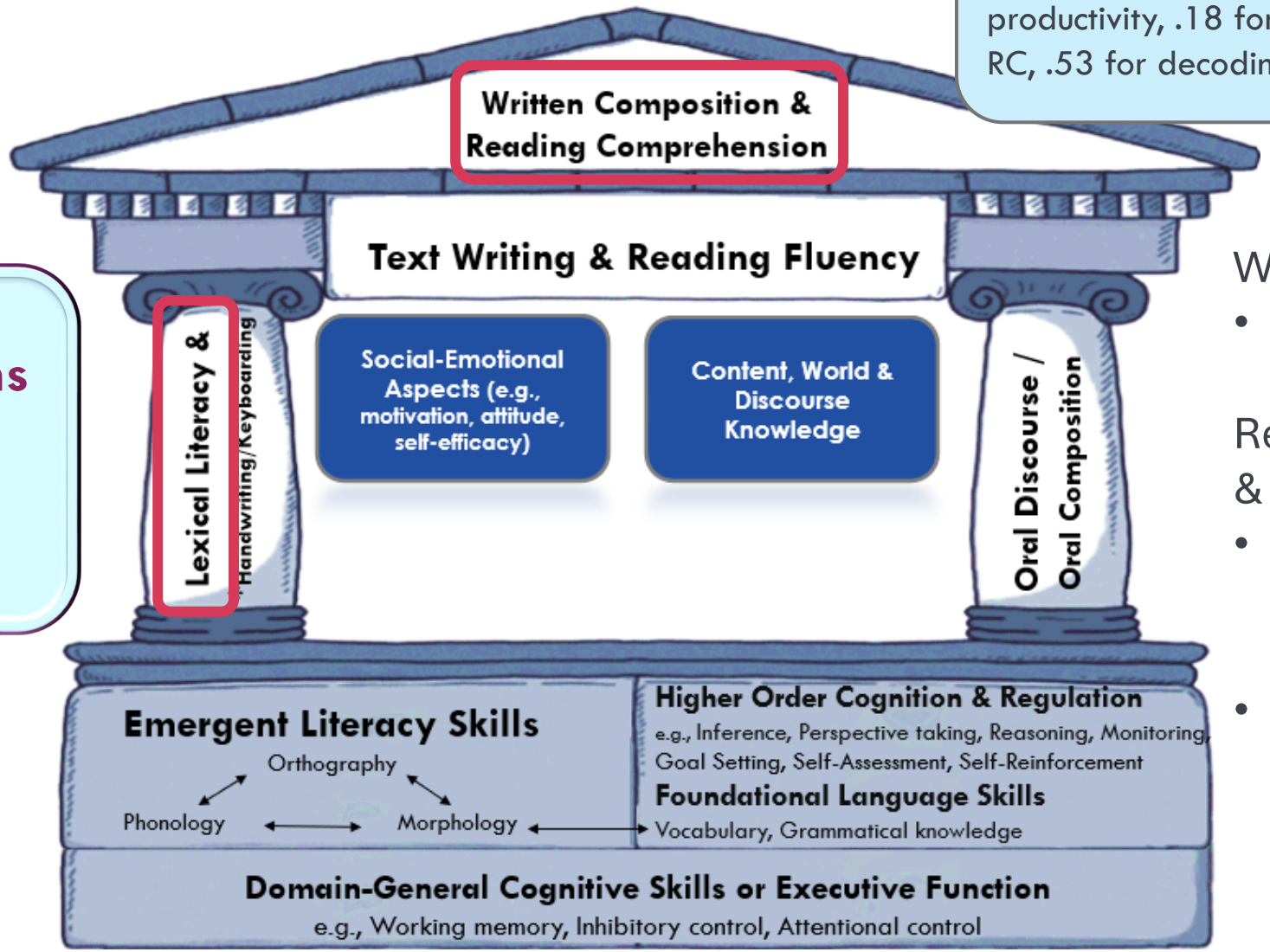
Effective Writing Instruction

Reading and Writing together

.47 for writing quality, .69 for writing productivity, .18 for writing mechanics; .39 for RC, .53 for decoding (Graham et al., 2017)

Make reading-writing connections visible to support transfer

(Kim, 2022a, b; Kim et al., 2023; Kim & Zagata, 2024)



Word Reading & Spelling

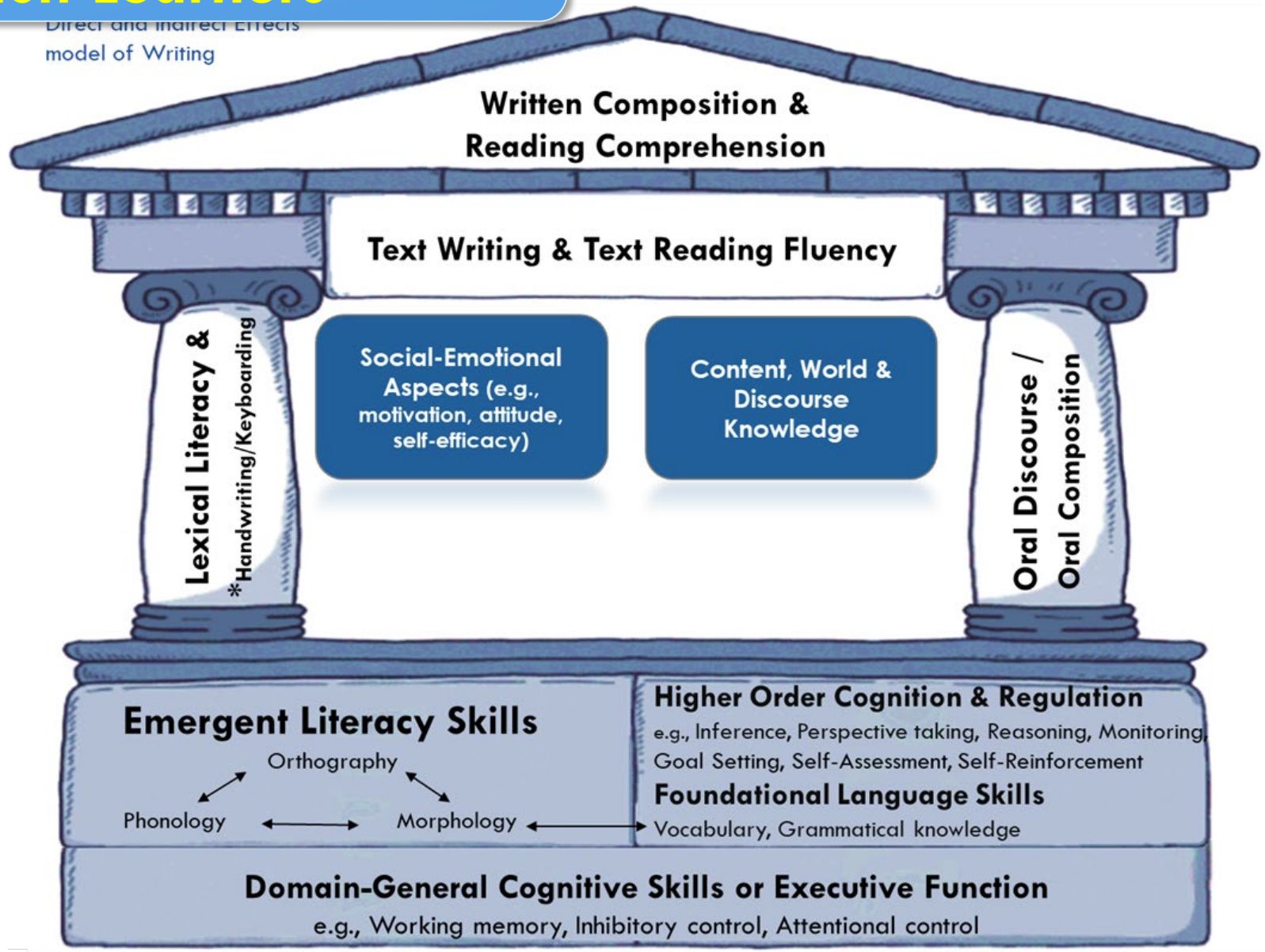
- e.g., word building

Reading Comprehension & Written Composition

- Incorporating writing opportunities in reading instruction
- Integrating reading materials into writing instruction

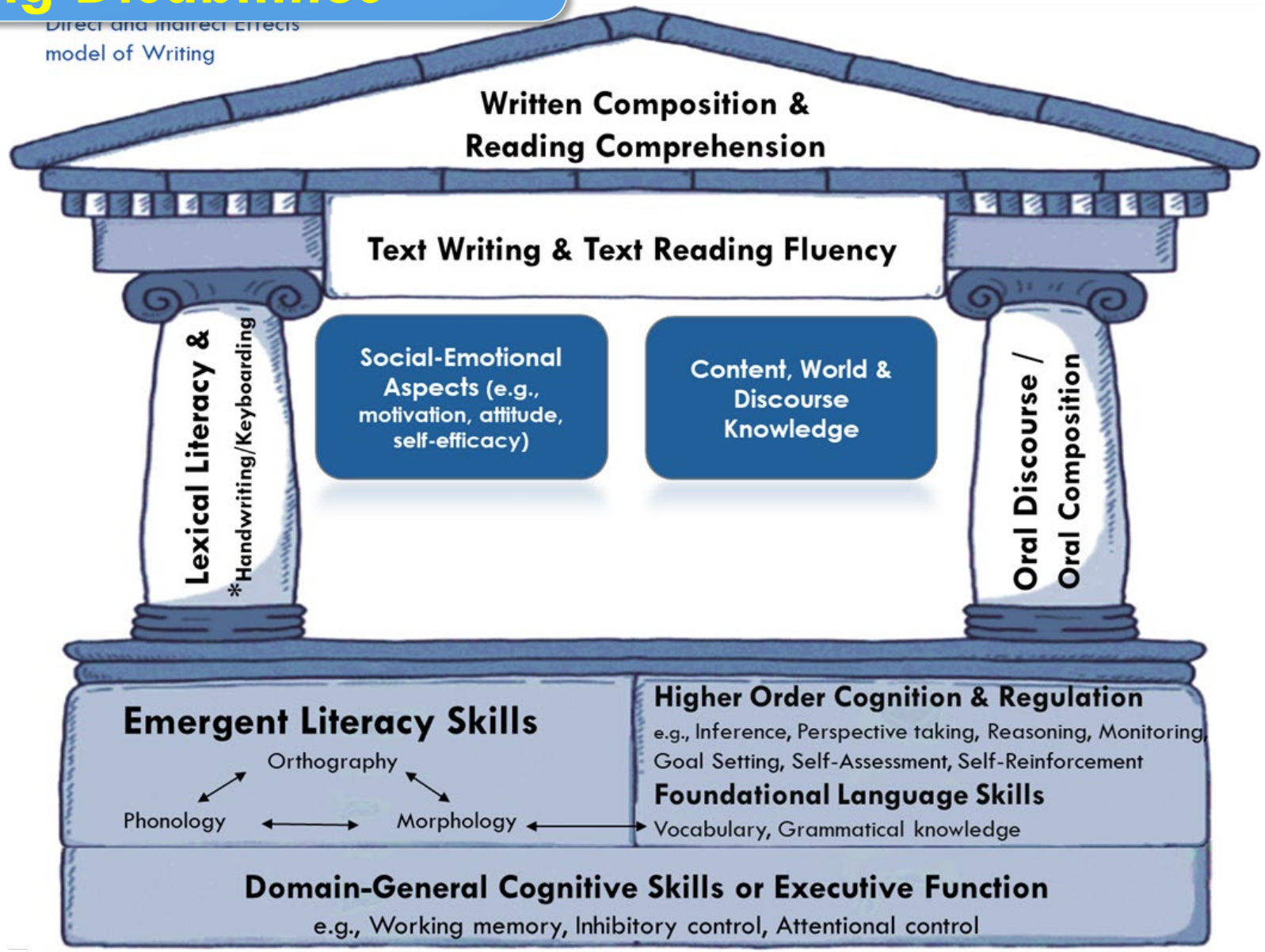
Effective Writing Instruction:
English Learners

Direct and Indirect Effects model of Writing



Effective Writing Instruction:
Learning Disabilities

Direct and Indirect Effects
model of Writing



Effective Writing Instruction: Summary

Effective Writing Instruction: Summary

- Time for writing instruction and writing practice
- Various genres & purposes
- Tasks & Activities

- Spelling, word reading, handwriting, & keyboarding
- Language support (sentence combining, linking words, vocabulary & expressions)
- Background knowledge (content & discourse knowledge—text structure)
- Integrate with reading instruction (close reading; model text & non-examples)

- Setting goals, generating & organizing ideas, evaluated and revised ideas
- Strategies for different processes (e.g., brainstorming, planning, graphic organizers, making notes, monitoring, self-reinforcement, summarizing, revising)
- Feedback

Incorporating technology

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