

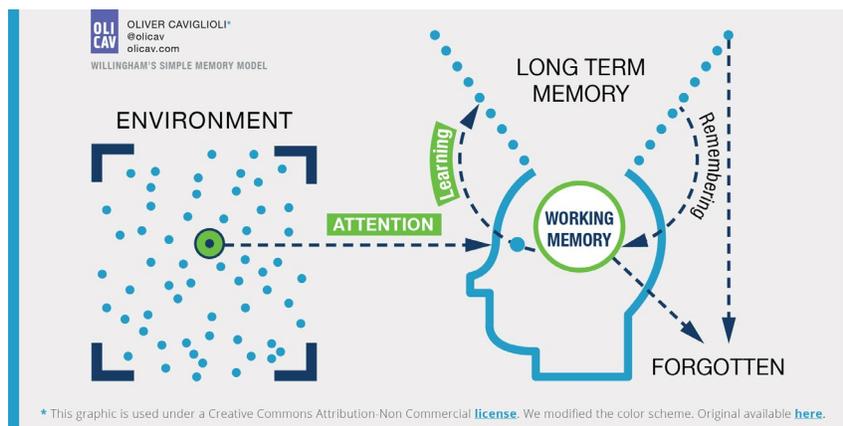
This special newsletter is coming to you from **Deans for Impact** to support your work in the Learning by Scientific Design Network. Together, we'll continue exploring how we can support novice teachers to use learning-science informed practices in their teaching. This week, let's take a look at the [principle](#) of Deepening Meaning and Learning, zeroing in on the teacher action of **prompting for effortful thinking**.

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## Teacher action

**Teachers' questions and tasks require students to engage in effortful thinking.**

**Background:** To learn something, we need to pay attention to it and then think deeply about the information. This teacher action focuses on the link between questions and tasks in the student environment, and the extent to which students effortfully engage with to-be-remembered content. In other words, are students analyzing, justifying, or explaining concepts, processes, or their own thinking, so that content moves from working memory to long-term memory? Learning takes place when we think about a concept in working memory and make connections to related concepts, examples, language, and representations in our long-term memory. The process of thinking through connections is called "elaboration." Questions and prompts that require elaboration can support encoding and consolidation of the new target concept in long-term memory.



# Connections to equity and justice

## *Thinking with a Critical Lens*

Dr. Ghody E. Muhammad's book, *Cultivating Genius*, defines "Criticality" as **the capacity to read, write, and think in ways of understanding power, privilege, social justice, and oppression, particularly for populations who have been historically marginalized in the world** (Muhammad, 2018). When youth have criticality, they are able to see, name, and interrogate the world not only to make sense of injustice but also to work toward social transformation.

In her book, she differentiates between lowercase c "*critical*" and uppercase C "*Critical*" when defining criticality. Lowercase "critical" means to think deeply about something; uppercase "Critical" is connected to an understanding of power, entitlement, oppression, and equity.

### Creating Questions to Engage Critically with Texts

Prompting students to think effortfully with a critical lens can foster deeper processing and create opportunities for connections among big ideas. These prompts help students develop as agents of change, who can unpack issues of power, equity, and oppression—and plan for action. In this article from Learning for Justice, you'll see how teachers might support students in reading with a Critical lens. [Read here.](#)



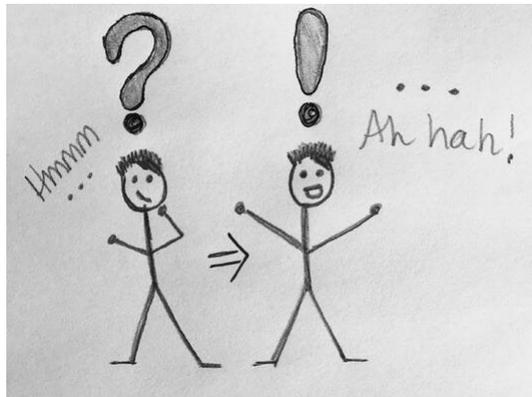
## Connections to classroom practice

### *Elaborative Interrogation*

If a teacher **asks deeper questions to only a subset of students**, or prompts everyone but holds only some students accountable for answers, then the benefits of effortful thinking are NOT equally available to all students. Students without opportunities to think effortfully will be **less likely to develop durable knowledge**. **Elaborative interrogation** is one (but not the only) strategy to get students to think effortfully and deeply.

- *Elaboration* is making meaningful connections between concepts building deeper, more nuanced schema.
- *Interrogation* refers to asking questions.

**Elaborative interrogation means asking HOW and WHY questions to get students to elaborate on answers.** The thinking required to do this helps encode information from working-memory into long-term memory.



### [The Learning Scientists: Elaboration Blogpost](#)

by Megan Smith & Yana Weinstein

In this post, the authors (both cognitive scientists) write to a student audience about the value of elaborative questioning for strengthening new knowledge. So, teachers support elaborative interrogation by making meaningful connections between concepts building deeper, more nuanced schema through the vehicle of asking questions. [Read here](#).

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## Lenses to observe for this teacher action

Consider these criteria while observing teacher-candidates on prompting for effortful thinking:



### Analyze & justify

Does the teacher prompt students to analyze, justify, or provide detailed explanations of to-be-remembered content?



### Timing

Does this prompting occur frequently, and in close proximity to key content?



### All learners

Do all students engage with those prompts and think deeply about key content?

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## Tips to explain and coach for this teacher action



Prompting students to engage deeply with content is not easy. It requires questions and tasks that ask students to analyze, justify, or provide detailed explanations of to-be-remembered content. This prompting is so important, because it requires students to think deeply about the content, and therefore move it from working to long-term memory where it will be stored and not easily forgotten.

From an equity perspective, we know that gaps in learning compound over time. If students are not given opportunities to think effortfully, and store their learning durably, then they may struggle not just with current concepts, but also with new concepts that build on that content. To generate prompts for effortful thinking, we have to ask ourselves, “what is the core content I need students to think deeply about?” and “what questions or tasks could I pose to ensure that they are thinking deeply?”

**Rehearsal Task: What is the core content embedded in your learning goal from today? To what extent did you prompt students to think deeply about this specific piece of the content?**



## Why it's important to provide prompts in close proximity to key content

The timing of engaging student in effortful thinking is important because it requires students to think deeply and therefore move core content from working to long-term memory where it will be stored and not easily forgotten. This kind of thinking builds and strengthens connections for students so they won't forget the key content.

From an equity perspective, to generate prompts for effortful thinking, we have to ask ourselves, "when should I pose questions or tasks that prompt my students to think deeply, to ensure they are effortfully engaged with that core content?" If students are not given opportunities to think effortfully, and store their learning durably, then they may struggle not just with current concepts, but also with new concepts that build on that content.

**Rehearsal Task: Identify places in the lesson where you could have infused a prompt for effortful thinking. When was the moment that it was absolutely crucial students thought deeply about content? What could you say or do at that moment to create a prompt for students to think effortfully?**



## Why it's important for each learner to think deeply about key content

Creating structures for all students to think deeply about key content is so important. Our goal is to be intentional and not leave student learning up to chance. We know that varied structures throughout a lesson can increase the likelihood that each student is engaged in deep thinking. For example, while most concepts are introduced in whole group, we may need a turn and talk or an independent stop and jot to ensure that all students are thinking carefully throughout the lesson.

From an equity perspective, it's important to ensure that all students are thinking deeply about key content, we have to carefully plan how students will be expected to engage in that thinking.

**Rehearsal Task: How does the prompt that you just generated support student learning? In what ways is it an improvement upon how you previously asked students to engage with the material?**