SCIENCE OF LEARNING: TEACHER ACTION OVERVIEW

Prompting Connections to Prior Knowledge

Deans for Impact

This resource from DFI's Learning by Scientific Design Network provides practicing teacher-educators with an overview of a learning science-informed teacher action. To access additional materials, visit deansforimpact.org/resources

Teachers prompt students to call up important prior knowledge and explicitly connect it to new ideas

The Model of the Mind

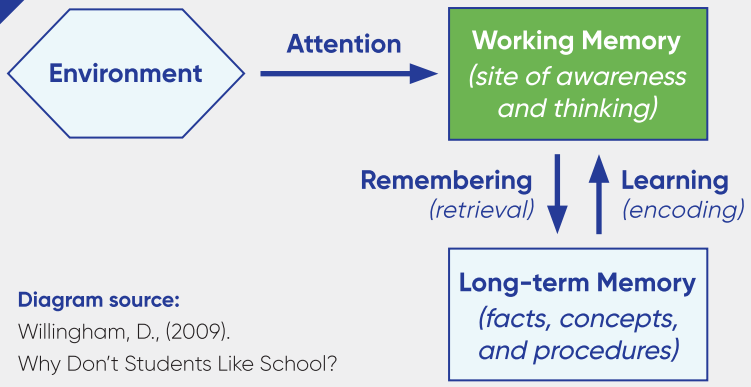

Diagram source:
Willingham, D., (2009).
Why Don't Students Like School?

We learn new ideas by relating them to things we already know.

We learn more effciently *and* effectively when prompted to "retrieve" information from long-term memory that we can use to process our new learning. Students who do not make successful connections to prior knowledge are less likely to understand new ideas.

Teachers should make instructional choices that prompt students to make connections to relevant knowledge they already have.

Why does prompting prior knowledge matter for students?

Students have lots of prior knowledge at their disposal, but if teachers don't purposefully activate it, students may not know what is most useful to help them make sense of new information. Because new learning builds on prior knowledge and how it's organized (in schema), learning gaps are exacerbated for students who may not encounter informal opportunities to learn about concepts outside of school. By making the organization of ideas visible and prompting students to think about those connections among prior and new learning, teachers can help all students sharpen schema and process new information.

What does this look like in the classroom?

Relevant Knowledge

Surface important, relevant prior knowledge that is specific.

Less relevant information may "clog" working memory and prevent more important information from being retrieved and used to process new learning. Focus on the most important concepts to target with students.

Schema

Make schema (structure of and relationships among concepts) explicit so students see the deep structure.

When students see and explain connections among concepts, they sharpen their schema so they can call up more relevant ideas to make sense of new ones.

All Learners

Structure prompts so that ALL learners have a chance to activate prior knowledge.

All students benefit from prior knowledge activation, but students with unfinished learning or fewer informal chances to learn about concepts outside of school especially benefit.

© 2023 Deans for Impact. All Rights Reserved

SCIENCE OF LEARNING: TEACHER ACTION OVERVIEW

Prompting Connections to Prior Knowledge

DFI

Common pitfalls novice teachers fall into

Brain Dump

Teacher uses unstructured, overly broad prompts (e.g. KWL charts, "What do you know about X?") that fail to target specific enough knowledge to ensure students are thinking about the most relevant material.

- ***Might look like:*** Students are learning about ocean currents and their impact on weather worldwide. The teacher starts a lesson asking "Take 3 minutes to jot down every fact you can think of related to oceans."
- ***Try instead:*** The teacher knows that in order to succeed in the lesson students will need to remember from their last lesson how solar energy heats water and then transfers to the air, increasing temperature. They ask, "Stop and jot in your notes: how does the sun warm the air? Can it do it directly? Why or why not?"

Superficial Skim

Teacher prompts for only surface-level knowledge without elaboration or uses prompts that elicit one-word answers or lists of isolated concepts (This might look like a teacher saying, "What did we learn last class? Penguins! Yes! So in this lesson…").

- ***Might look like:*** Students are about to read a letter by Eleanor Roosevelt and civil rights activist Mary McLeod Bethune about human rights. The teacher says, "Let's recall some information about Mrs. Roosevelt. She was important in the creation of what UN document? "The Declaration of Human Rights!" says a student, and the teacher agrees.
- ***Try instead:*** The teacher asks students to do a card sort and organize a variety of terms (UN Declaration of Human Rights, Jim Crow Laws, Mary McLeod Bethune, civil liberties, etc.) into categories and explain their thinking to a partner.

Taking Hands

Teacher engages only a few students so only some receive opportunities to activate prior knowledge.

- ***Might look like:*** A teacher asks "How does the temperature of the ocean impact the temperature of a coastal city? I see three hands…Elijah, what do you think?"
- ***Try instead:*** The teacher offers directions on the prompt as "Turn and talk to your partner about…" or "take 3 minutes to write or illustrate in your notes…"

Tangential Personal Connections

Teacher focuses on less relevant personal connections that don't help students leverage prior academic knowledge to learn new content.

- ***Might look like:*** In the Eleanor Roosevelt letter lesson above, the teacher says "Turn and talk to your partner: who is a female leader in your life? Why is she important to you?"
- ***Try instead:*** The teacher asks "Choose one of the leadership qualities we discussed as a class from our wall display. Tell your partner: in what ways do you see this quality in the life and work of Eleanor Roosevelt? Mary McLeod Bethune?

These science of learning materials are © 2023 Deans for Impact licensed under a Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International License

© 2023 Deans for Impact. All Rights Reserved