Bridging Minds: Connecting Experiences to New Concepts for Higher-Order Thinking

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Time Frame 80 minutes

Essential Question(s)

How can we use students' prior knowledge and critical thinking skills to assist them in developing a higher level of understanding?

Summary

In this session, participants will explore the construction of knowledge, one of the components of authenticity. Participants will discover the value of learning experiences that reflect real-world contexts and challenges by connecting students' prior experiences with new concepts to deepen understanding and foster critical thinking. Participants will complete authentic tasks that require the application of higher-order thinking skills and learn how to cultivate meaningful learning experiences that prepare students for real-life problem-solving and decision-making.

Learning Goals

- Recognize the importance of connecting students' prior experiences to new concepts.
- Apply higher-order thinking skills to solve complex problems and analyze methods to teach students how to use those skills to make informed decisions.

Standards

InTASC Model Core Teaching Standards (K-12th)

1d: The teacher understands how learning occurs-- how learners construct knowledge, acquire skills, and develop disciplined thinking processes--and knows how to use instructional strategies that promote student learning.
2c: The teacher designs instruction to build on learners' prior knowledge and experiences, allowing learners to accelerate as they demonstrate their understandings.
4d: The teacher stimulates learner reflection on prior content knowledge, links new concepts to familiar concepts, and makes connections to learners' experiences
4h: The teacher creates opportunities for students to learn, practice, and master academic language in their content.
8j: The teacher understands the cognitive processes associated with various kinds of learning (e.g., critical and creative thinking, problem framing and problem solving, invention, memorization and recall) and how these processes can be stimulated.

Attachments

- ELA—Card Sort—Bridging Minds.docx
- ELA—Card Sort—Bridging Minds.pdf
- Frayer Model—Bridging Minds.docx
- Frayer Model—Bridging Minds.pdf
- Inside Out—Bridging Minds.docx
- Inside Out—Bridging Minds.pdf
- Instructional Strategy Note Catcher—Bridging Minds.docx
- Instructional Strategy Note Catcher—Bridging Minds.pdf
- Math—Card Sort—Bridging Minds.docx
- Math—Card Sort—Bridging Minds.pdf
- Presentation Slides—Bridging Minds.pptx
- Science—Card Sort—Bridging Minds.docx
- Science—Card Sort—Bridging Minds.pdf
- Social Studies—Card Sort—Bridging Minds.docx
- Social Studies—Card Sort—Bridging Minds.pdf

Materials

- Presentation Slides (attached)
- Inside Out handout (attached, one per group of two or three participants)
- Card Sort sets (attached, one per group of two or three participants; use math, ELA, social studies, or science card sort depending on the content areas of your participants)
- Components of Authenticity: Construction of Knowledge research brief (linked, one per participant; print two-sided)
- Frayer Model handout (attached, one per participant)
- Authentic Lesson Reflection Tool handout (linked, one per participant)
- Instructional Strategy Note Catcher handout (attached, one per participant)

10 minutes

Engage

Facilitator's Note: Session Preparation

This professional learning experience includes customization to meet the needs of your audience. Each portion of the session includes different materials to prepare based on the content area(s) of your participants. See the **Facilitator's Notes** at the beginning of each phase for more information on which session materials to prepare.

Use the attached **Presentation Slides** to guide the session. Begin by displaying the title slide and introducing yourself and the session to the participants. Transition to **slide 3** and invite participants to reflect on the following prompts:

- Why is it important to determine your students' prior knowledge about a topic?
- How do you currently assess students' prior knowledge?

Invite participants to discuss their responses to the prompts as a group at their table, then ask a few participants to share out their responses.

Display **slide 4** and distribute the **Inside Out** handout to each participant. Read aloud the following prompt from the slide:

- What do you know about gauging students' prior knowledge?

Invite participants to fill in the innermost circle of the handout with their response to the prompt and begin the 1-minute timer on the slide.

Once time is up, transition to **slide 5** and ask participants to find a partner. Invite each pair to discuss their responses to the prompt and and record any new ideas in the middle circle of the handout labeled "What I learned from my discussion with my partner." Start the 3-minute timer on the slide.

After participants have had time to discuss, briefly explain the Inside Out instructional strategy to the whole group. Explain that this strategy helps students arrange, organize, and connect prior knowledge to new information on a topic, which contributes to the overall construction of knowledge. Invite participants to set aside their handouts as they will use them again later.

Transition to **slides 6 and 7** and highlight the essential question and learning goals of this session.

15 minutes

Explore

Facilitator's Note: Card Sort Preparation

Prior to the session, select the card sort(s) you plan to use based on your participants' content area(s). Each card sort uses the Oklahoma Academic Standards for the middle school level, but you may replace these with a set of standards for a different state or grade level.

Prepare one set of cards for each small group (approximately two to three people) in your session. Print each set on cardstock, or other paper if cardstock is not available, then cut out the cards, rearrange them, and place each set in a zip-top bag. Distribute one set to each group. Detailed instructions for each content area can be found on individual card sort attachments.

Facilitator's Note: Slide Preparation

Prior to the session, locate the website for the academic standards for your state, content area, and grade level. Copy and paste the link into **slide 9**.

Ask participants to form groups of two or three and pass out one set of the prepared **Card Sort sets** to each group. Transition to **slide 8** and explain the instructions. Allow participants time to work and walk around the room offering assistance to and answering questions from groups as needed.

Once each group has had the opportunity to organize their cards, transition to **slide 9** and notify the participants that they will return to the cards later. Explain that participants will now explore their state's academic standards using the link included in the slide. Allow participants time to read through the standards, then ask if they would like to adjust their card groupings.

Invite groups to share out how they organized their cards and any strategies or methods they used to sort them. As a whole group, discuss these methods and the final results of each group's card sort. Finally, explain the Card Sort instructional strategy to participants, mentioning that this strategy invites students to both sort prior knowledge of a topic and justify their organization of topics to their classmates.

20 minutes

Explain

Display **slide 10** and organize participants into groups of four. Give each participant a copy of the **Components of Authenticity: Construction of Knowledge** research brief. Ask participants to individually read the brief and allow them time to do so.

Once it appears that most participants have read the handout, display **slide 11** and give each person a copy of the **Frayer Model handout**. Explain that each group member will fill in a different quadrant of the handout to demonstrate their understanding of Construction of Knowledge. Ask each member of the group to choose one of the following prompts present on the handout:

- **Define:** How would you define “construction of knowledge” in your own words?
- **List the Characteristics:** List three to five essential characteristics of COK.
- **Draw a visual representation:** Sketch a scene or symbol that represents COK.
- **Reflect:** How does this look in your class? Give an example of how COK looks in your class.

Once each group member has filled out their individual section, ask them to discuss their responses as a group. Each person will fill in the remaining sections of their Frayer Model with the responses from their peers.

Allow groups approximately fifteen minutes to discuss and fill in their Frayer Models. After most participants have completed their handouts, invite each group to share out one of the segments of their model.

Briefly explain the Frayer Model instructional strategy. Inform participants that this strategy encourages students to organize both prior and new knowledge about a topic.

30 minutes

Extend

Facilitator's Note: Lesson Preparation

Prior to the session, select one of the following 5E lessons depending on your participants' content area. If you are working with teachers across multiple content areas or different grade levels, or if the participants have already used this lesson, select a different model lesson to meet your needs.

Download the narrative of one of the following lessons by navigating to the lesson in LEARN and selecting the **Download PDF** button.

- English Language Arts lesson: Nose Like a Cherry: Understanding Similes & Metaphors
- Math lesson: Shiver Me Functions!
- Science lesson: Venom: From Lethal to Livesaving
- Social Studies lesson: Federalists vs. Anti-Federalists

Display **slide 12** and pass out one copy of the model lesson and one copy of the **Authentic Lesson Reflection Tool** handout to each participant. Ask participants to read through the model lesson and identify where they see components of Construction of Knowledge present in the lesson.

Allow participants time to read the brief, then place then into small groups. Ask each group to discuss the following prompts:

- What prior knowledge do your students need in order to understand the lesson?
- How does the lesson encourage students to use Construction of Knowledge?
- How would you prepare to deliver the lesson to your students? Would you need to scaffold, modify, etc.?

Allow participants time to discuss the questions, then come together as a whole group. Invite participants to share their responses.

5 minutes

Evaluate

Display **slide 13** and ask participants to retrieve their Inside Out handouts. Ask participants to reflect on what they have learned about Construction of Knowledge during this session then respond to the prompt in the outermost circle of their handouts.

Invite participants to share out their responses.

Transition to **slide 14** and invite participants to reflect on the different instructional strategies they saw used throughout the session. Ask them to consider the impact these strategies had on their understanding or approach.

As they reflect, pass out one copy of the **Instructional Strategy Note Catcher** handout to each participant. Invite participants to fill in the first column with their thoughts on how each strategy impacted their understanding of the content. Ask them to fill in the second column with their ideas about how to integrate each strategy into their teaching practices.

If time permits, invite participants to share out their ideas about how they could use the instructional strategies in their classrooms.

Research Rationale

Learning involves actively relating new concepts to one's pre-existing understanding and personal experiences (Bransford et al., 2000). New insights from cognitive, neurological, and developmental research emphasize that learning is a sophisticated interplay between learners and their social and physical contexts, resulting in observable changes to the brain's neural architecture (Liu et al., 2017; National Academies of Sciences, Engineering, and Medicine [NASEM], 2018). Recent studies also indicate that, while deep cognitive processing generally yields superior learning outcomes, the specific results are contingent upon three primary factors: the complexity of the learning task, the degree of instructional scaffolding provided, and the differences in learners' prior knowledge. Notably, both superficial and deep cognitive processes frequently co-occur within a single learning activity. This simultaneous engagement can either facilitate or impede the learner's progress, largely dependent on the design and structure of the educational task (Dinsmore & Alexander, 2016). Educators play a crucial role in facilitating meaningful learning by creating diverse opportunities for students to engage in active learning and employ higher-order cognitive skills.

Resources

- Bransford, J., Brown, A. L., & Cocking, R. R. (2000). *How people learn: Brain, mind, experience and school (expanded edition)*. National Academies Press.
- Dinsmore, D. L., & Alexander, P. A. (2016). A multidimensional investigation of deep-level and surface-level processing. *Journal of Experimental Education, 84*(2), 213–244. https://doi-org.ezproxy.lib.ou.edu/10.1080/00220973.2014.979126
- K20 Center. (n.d.). Authentic lesson reflection tool. https://k20center.ou.edu/wp-content/uploads/2023/07/Authentic-Lesson-Reflection-Tool.pdf
- K20 Center. (n.d.). Card Sort. Strategies. https://learn.k20center.ou.edu/strategy/147
- K20 Center. (n.d.). Components of authenticity: Construction of knowledge—K20 IDEALS. *The IDEALS Framework*. https://k20center.ou.edu/wp-content/uploads/2023/07/Construction-of-Knowledge_COA.pdf
- K20 Center. (n.d.). Frayer model. Strategies. https://learn.k20center.ou.edu/strategy/126
- K20 Center. (2021, September 21). *K20 Center 1 minute timer* [Video]. YouTube. https://www.youtube.com/watch?v=6ilD555O_RE
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- Liu, Z., Grady, C., & Moscovitch, M. (2017). Effects of prior-knowledge on brain activation and connectivity during associative memory encoding. *Cerebral Cortex, 27*(3), 1,991–2,009. https://doi.org/10.1093/cercor/bhw047