

LEARN 5E Instructional Strategies

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Time Frame 2-3 hours

Essential Question(s)

How might the use of instructional strategies support 5E lesson design?

Summary

In this professional development session, participants discover how various instructional strategies can be used as authentic tools to create and facilitate student-centered lessons with the 5E Instructional Model. Individually, participants will choose a component of the 5E Instructional Model (Engage, Explore, Explain, Extend, Evaluate) and then work in groups to explore how specific strategies from the K20 LEARN site might support lesson design and implementation.

Learning Goals

- Participants will identify the components of the 5E Instructional Model.
- Participants will identify and explain how instructional strategies from the K20 LEARN site might meet the criteria of the 5E components.
- Participants will explore a component of the 5E model and identify how specific instructional strategies support student learning within that component.
- Participants will identify and explain how the implementation of instructional strategies in a 5E lesson might be used to create an authentic student-centered learning environment.
- Participants will identify and explain how the implementation of instructional strategies might be used within their content to design a 5E lesson.

Attachments

- 5E Card Sort Answer Sheet OPTIONAL — LEARN 5E Instructional StrategiesL.pdf
- 5E Card Sort OPTIONAL— LEARN 5E Instructional Strategies.pdf
- 5E Lesson Model Article — LEARN 5E Instructional Strategies.pdf
- Graphic-Organizer-LEARN-5E-Instructional-Strategies.docx
- Instructional Strategy Note Sheet— LEARN 5E Instructional Strategies.docx
- Presentation Slides — LEARN 5E Instructional Strategies.pptx
- SCORE Reflection — LEARN 5E Instructional Strategies.docx
- Session Agenda — LEARN 5E Instructional Strategies.docx
- We Think, I Think T-Chart — LEARN 5E Instructional Strategies.docx

Materials

- Presentation Slides (attached)
- Session Agenda (attached)
- LEARN Instructional Strategy Note Sheet (attached)
- 5E Lesson Model handout (attached)
- LEARN 5E Graphic Organizer (attached)
- We Think, I Think T-chart (attached; print double-sided)
- SCORE Reflection (attached)
- 5E Card Sort and Answer Sheet (optional; attached)
- Colored paper: red, yellow, and green (one sheet per color)
- Paper and pencils/pens
- Participant computers & Chrome browser on each device
- Internet access
- Access to instructional strategies from the K20 LEARN site (or printed copies from the LEARN site, detailed below)
- Poster paper labeled with the 5Es to create the Reverse Sticky Bars Strategy
- Five different colors of sticky notes (see the Presenter's Note in the Explore section for the quantity of each color)

Engage

Presenter's Note: Preparation

Before presenting, have all handouts and materials available on a table for participants. Tables should be organized into small groups. Before the session, make sure to create and label the components of the 5Es on the poster for the Reverse Sticky Bars strategy. Sticky notes will be placed on the poster to create the "bars" in a bar graph *(see the Explore section below for more details and an example on slide 6 of the Presentation Slides)*. Also, determine if you and participants will have internet access during this session. If not, print at least six instructional strategy cards from the K20 LEARN site for each of the 5E components beforehand; this way, groups can use these during the Explore activity.

Use the attached **Presentation Slides** to guide the session. Begin with **slide 2** to display the title of the PD. Welcome participants, and briefly introduce yourself and the professional development session. Identify the attached **Session Agenda** on each table as well as the attached **Instructional Strategy Note Sheet**, and invite participants to take notes as each strategy is modeled during the session.

Move to **slide 3**, "The 5E Lesson Model." Ask participants to use a Stoplight strategy self-assessment activity to self-identify regarding their knowledge of the 5E Instructional Model: Green (expert), "I am pretty familiar with the 5E model and use it to structure my lessons"; Yellow (intermediate), "I have heard of the 5E before, but I'm not really sure what it entails"; or Red (beginner/novice), "The 5 Whats?"

Then, ask participants to move to the area of the room that matches their level of experience, designated by color. Within these experience groups, have participants share briefly what they know about the 5E Instructional Model. If a participant feels they are not in the correct group based on the brief conversation, then they may move to another group that is a better fit. As the yellow and green groups discuss what they already know, have the red group write questions they have about the 5E Instructional Model.

Once participants have an opportunity to talk within their own groups, the yellow group shares out what they know about the 5E Instructional Model first. This acknowledges what they do know. Then, the green group elaborates on the yellow's explanations. The red group (and yellow group, if needed) then have the opportunity to ask questions to learn a little more about the topic or ask for clarification about the 5E Instructional Model. If they don't have any questions remaining, they may synthesize the knowledge they gained from the other two groups. As the facilitator, you can provide additional information and help answer questions after the other groups have had the opportunity to share.

After groups have finished sharing and asking questions, change to **slide 4** and pass out the attached **5E Lesson Model** handout. Participants will read through the handout, thus creating a leveled understanding for each participant. Also, it will be the main resource to refer to for the rest of the session.

Presenter's Note: Creating the Reverse Sticky Bar Poster

As participants read through the 5E Lesson Model handout, place the sticky notes on the Reverse Sticky Bar poster.

Explore

Show **slide 5**, "Today we will . . . " and briefly highlight the session objectives. This will provide a road map of where you will go together during the session and let participants know what to expect.

Presenter's Note: How to Create the Reverse Sticky Bars Poster

Label a poster with the 5Es (Engage, Explore, Explain, Extend, and Evaluate) like a bar graph might be labeled, either on the x-axis (horizontally along the bottom) or on the y-axis (vertically along the left-hand side). Then, place different color sticky notes above each E component (for example, Engage, pink; Explore, green; Explain, yellow; Extend, purple; and Evaluate, blue). Place just enough sticky notes in each column to control group sizes and to ensure that small groups for each E component will be similar in size (for example, if you have 20 participants, place only four stickies above each E component. If you have 34 participants, place seven stickies above each E component. For larger groups, divide each component into two or more smaller groups). This strategy is a modified version of Sticky Bars.

Change to **slide 6**, "Sticky Bars." Ask participants if anyone is familiar with the Sticky Bars Strategy and, if so, if they would mind sharing a short explanation of the strategy. If no one is familiar with it or willing to share, you may share a short explanation of the strategy.

After the short description, click the slide again to bring up the word "Reverse" and the first task. Explain how Reverse Sticky Bars will work (participants will pull a sticky from the poster instead of placing one on it). Ask participants to think about the 5E components they would like to learn more about. Specifically, instructional strategies that align with that component and how they support authentic teaching and learning experiences within the 5E lesson model. Then, send participants to the Reverse Sticky Bars poster a few at a time to remove one sticky note located above the component they would like to explore further (*Note: A second or third choice may be required in the event that their first choice is already taken).*

Change to **slide 7** and have participants group with others who have like-colored stickies. Explain that the strategies being explored today can all be found on the K20 LEARN site. It is a great resource for teachers and students, providing 5E lessons, instructional strategies, and other activities for learning beyond the traditional classroom.

Slide 8 displays the first four strategies on the K20 LEARN site. This may be used if you cannot access the internet to highlight the whole LEARN site. If you have internet access, use the hyperlink in the presentation to access the LEARN site.

Change to **slide 9**, "Instructional Strategies Quest." If there is internet access, groups will either use the K20 LEARN site to filter the instructional strategies by 5E component, or they will receive a list of strategies grouped by components. If participants do not have internet access, they should receive a printed copy of the instructional strategies that best fit within the component they are exploring.

Presenter's Note: Using the K20 Learn Site

Once at the K20 LEARN site (learn.k20center.ou.edu), click on the STRATEGIES tab. Then, click on the box in the upper right-hand corner, labeled SHOW ADVANCED FILTERS, and look under the third heading titled PLACEMENT IN LESSON. The 5Es are listed there in order from left to right (**Engage**/Opening, **Explore**/Learning Activity, **Explain**/Closing, **Extend**/Additional Learning Activity, **Evaluate**/Assessment). Select the component that is being investigated. ***NOTE: The LEARN Site works best using the Google Chrome Browser.**

Presenter's Note: Printing Strategies From the K20 Learn Site

Follow the directions above and then select the individual card you would like to print. To the right of the card, there are three options. Select the option "Download Strategy Poster PDF" to print all information on one side. Using this option, presenters might print two different cards on the same sheet of paper, one on the front and the other on the back (see below for suggested strategies to print).

Suggested Instructional Strategies

Engage: Commit and Toss; Always, Sometimes, Never True; Inside Out; I Notice, I Wonder; ABC Graffiti; and Fold the Line

Explore: Jigsaw; Strategy Harvest; Frayer Model; Justified True or False; Paired Texts H-chart; and CUS and Discuss

Explain: Gallery Walk/Carousel; Anchor Charts; Inverted Pyramid; Color, Symbol, Image; Claim Evidence Reasoning; and I Think, We Think

Extend: Example and Non-Examples; Synectics; Metaphorical Thinking; and Create the Problem

Evaluate: Exit Ticket; Triangle, Square, Circle; Two-Minute Paper; I Used to Think, But Now I Know; 3-2-1

Based on the selected method from above, instruct groups to use the resources provided (***5E Lesson Model handout, LEARN 5E Graphic Organizer,*** *and the filtered instructional strategies from the K20 LEARN site*) to review the descriptions of these strategies.

Groups will identify how these strategies meet the criteria for the 5E component they are exploring. The LEARN 5E Graphic Organizer will be used to record examples and evidence of the component. Allow at least 15 minutes for groups to work.

5E Graphic Organizer Instructions

Write the 5E component being explored in the center circle. Choose at least four strategies, and in each box, write the strategy name and how it meets the criteria of the 5E component.

Explain

Presenter's Note: I Think, We Think

During the Explain and Extend, you will use an adaptation of the I Think, We Think strategy. Typically, learners will need to process what they know or understand about a topic before working with other learners; but in this context, we have already activated prior knowledge, and participants have had an opportunity to learn more. Learners are now provided with the time to explain what they have learned as a group using the We Think and then the I Think to extend their learning into practical use for lesson design.

After groups work for at least 15 minutes, ask them to wrap up any final thoughts. Instruct all participants to turn their paper over to the back and view the T-chart labeled "We Think, I Think."

Change to **slide 10**, "We Think." Instruct each group to pick one strategy that they all would like to share aloud with the whole group. First, give them a minute or two to quickly discuss, choose, and record this strategy under the "We Think" column of the T-chart.

Then, ask the groups to share their selected strategy and how it meets the criteria of the 5E components with the whole group. As groups share, encourage the other groups to take notes under the "We Think" column. Participants may ask questions if necessary. The facilitator may elaborate on the strategy when necessary, but this elaboration should not dominate the conversation, since this is about what the groups have learned about the strategies.

Possible Response

"The instructional strategy Commit and Toss meets the criteria for the Engage component because it allows students to access prior knowledge but keeps responses anonymous. The teacher is able to see what students collectively know or understand, and students learn from others based on the responses shared after tossing."

Optional Practice Activity

If you have more time to fill, consider having the groups share their selected strategy by modeling it for the whole group with content of their choice.

Optional Pre-Extension

For more scaffolding on the 5E model, unhide **slide 11** and use a card sort here. This will reinforce correct understanding of the criteria for each component of the 5E model, give participants some practice recalling what they already know, as well as enrich their understanding of these criteria in terms of what the teacher is doing and what students are doing during each part of a 5E lesson. To carry out the card sort, first hand out the larger white cards that have the names of the part of a 5E lesson printed on them (Engage, Explore, Explain, Extend, and Evaluate). Then hand out the smaller blue and yellow cards. The blue cards will have teacher actions printed on them and the yellow cards will have student actions printed on them. You may choose to reveal the difference upfront or after they sort.

Extend

Once groups have each shared one strategy, change to **slide 12**, "I Think." Ask participants to consider and record, on the right side of the T-chart, how one of the strategies they explored in this session might be used in their own content area when creating a 5E lesson. This strategy does not need to be the strategy shared by their group.

Allow a few participants to share out the strategy and how they could implement it in a 5E lesson. Encourage others to record what is shared in the "I Think" column of the T-chart.

Possible Responses

- "I could use the Card Sort strategy in math for students to explore the real number system. This would fit with the the Explore and the Explain components because students would have to agree that the numbers are sorted into the correct areas of the number system and justify why when sharing out with the whole group."
- "I would use the Example and Non-Example strategy to Extend student learning because they would need to find real-world examples or non-examples of the content explored that day in class. By finding both examples and non-examples, students must critically think about the connections outside the classroom."

Evaluate

Change to **slide 13,** "I Notice, I Wonder." Ask participants to silently reflect on this session, thinking about the strategies they used, heard, or learned today; the 5E lesson components; and any questions they may still have.

After a moment of quiet reflection, instruct participants to use the Instructional Strategy Note Sheet to record three things they notice about how the 5E model supports student-centered learning. These will be written in the designated space on the left side of the chart at the bottom of their instructional strategies note sheet. Then, to the right, they should write one question they still have regarding any of the topics discussed today.

If time allows, briefly have a few participants share out some of these items recorded. When participants are allowed to ask their questions, it provides an opportunity for them to be answered by either the facilitator or the other participants. This is also an opportunity to clarify any misconceptions about the session or strategies explored today.

At the end of the session, transition to **slide 14** and encourage participants to use at least one of the strategies explored today in an upcoming lesson. Inform them there will be a follow-up session, and during that session, they will reflect on the implementation of these strategies.

Follow-up Activities

Presenter's Note: Reflecting on Learning

Anywhere from a week to a month after the session, host a scheduled informal reflection with small groups of participants who attended the formal professional development session (this can be one session with all participants or multiple sessions with different participants each time). These follow-up sessions can be held during a PLC or teacher planning period, since they are to be short and informal. Use **slide 14** and the attached SCORE Reflection handout for this follow-up session.

Begin the follow-up session with **slide 14** displayed. Once the session begins, display **slide 15** and ask participants to use the attached **SCORE Reflection** handout to jot down notes from their experience with implementing an instructional strategy as a result of this session. The questions on **slide 16** will help guide the discussion. Ask each question and give attendees a moment to share their strategies and experiences.

Encourage attendees to use another strategy and continue to follow up with each participant if you are able. Continual professional collaboration and discussion will create a safe environment of accountability.

Research Rationale

The 21st-century student needs opportunities to critically think, collaborate, problem-solve, and relate knowledge to experiences outside the classroom (Lombardi, 2007). The LEARN instructional strategies can provide that opportunity when implemented as an authentic instructional tool to create and facilitate student-centered lessons using the 5E Instructional Model lesson design. It is unreasonable to expect students to develop necessary 21st-century skills in a traditional classroom because, typically, lessons designed in these environments do not create opportunities for students to practice high levels of critical thinking, collaboration, or problem-solving, nor do they allow practice in connecting new information to experiences outside the classroom setting.

By using instructional strategies that promote authentic and inquiry-based teaching, students can gain more autonomy and meet high expectations for learning. When comparing traditional teaching approaches, such as note taking with lectures or bookwork, to more active learning, such as the use of LEARN instructional strategies within a 5E lesson, the lessons that promote active learning have been shown to increase student achievement on assessments as much as 55% (Freeman et al., 2014). The 5E instructional model provides a research-based learning cycle lesson format in five phases (Engagement, Exploration, Explanation, Extension, and Evaluation). These phases allow students to engage in learning new content though meaningful learning experiences. These meaningful learning experiences provide opportunities for students to construct knowledge through exploration and they support higher-order thinking through discourse, discussion, and explanations, deepening understanding through extension and elaboration of learning and assessing understanding through relevant and meaningful evaluations. The LEARN strategies can be naturally implemented to create an active, engaging, and meaningful learning experience for the 21st-century student.

Resources

- Abell, S.K. & Volkmann, M.J. (2006). Seamless assessment in science: A guide for elementary and middle school teachers. Chicago, IL: Heinemann and Arlington, VA: NSTA Press.
- Bybee, R.W. (1997). Achieving scientific literacy: From purposes to practices. Portsmouth, NH.
- Bybee, R. W. (2009). The BSCS 5E instructional model and 21st century skills. Washington, DC: National Academies Board on Science Education.
- Colburn, A. (2003). The lingo of learning: 88 educational terms every science teacher should know. Arlington, VA: NSTA Press.
- Freeman, S., Eddy, S. L., McDonough, M., Smith, M. K., Okoroafor, N., Jordt, H., & Wenderoth, M. P. (2014). Active learning increases student performance in science, engineering, and mathematics. Proceedings of the National Academy of Sciences of the United States of America, 111(23), 8410-8415. doi:10.1073/pnas.1319030111
- Heinemann. Morgan, E., & Ansberry, K. (2013). Even more picture perfect science lessons, K-5: Using Children's Books to Guide Inquiry. Arlington, VA: NSTA Press.
- K20 Center. (n.d.). 3-2-1. Strategies. https://learn.k20center.ou.edu/strategy/d9908066f654727934df7bf4f5059a7b
- K20 Center. (n.d.). Card sort. Strategies. https://learn.k20center.ou.edu/strategy/d9908066f654727934df7bf4f506976b
- K20 Center. (n.d.). I think / we think. Strategies. https://learn.k20center.ou.edu/strategy/d9908066f654727934df7bf4f5065bfd
- K20 Center. (n.d.). Sticky bars. Strategies. https://learn.k20center.ou.edu/strategy/d9908066f654727934df7bf4f505ee0f
- Lombardi, M. M. (2007). Authentic learning for the 21st century: An overview (Report No. 1). Boulder, CO: EDUCAUSE Learning Initiative.