Introduction

Transcript:

This is an introductory module on nine categories of strategies for effective instruction that were researched and developed by McREL: Mid-Continent Research for Education and Learning.

There are two objectives for this module. The first is that by the time you reach the end you will be able to identify and explain McREL’s nine strategies for effective classroom instruction.

The second is that you will be able to identify best practices and common pitfalls associated with each group of strategies.

Menu
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Where do these strategies come from?

Let’s take a moment to briefly explain where these strategies come from. McREL International is a private, nonprofit, nonpartisan education research and development group. In the late 1990’s, a team of researchers at McREL undertook a large-scale study to identify which teaching practices corresponded most strongly with increased student learning and achievement.

They performed a meta-analysis that analyzed hundreds and hundreds of published research studies on various instructional techniques.

Two Key Findings

Through this study, they reached two key findings:
First, there is evidence that an individual classroom teacher can have a significant effect on student achievement. In other words, **teachers matter**.

Second, they identified nine different *groups* of instructional strategies with empirical evidence showing that student achievement was more likely to increase when they were used. In 2001 they published their findings in a book: *Classroom Instruction That Works*.

A second edition of this book was published in 2012. This edition contained updates that reflected an additional decade of research, as well as a tool called the McREL Instructional Planning Framework. This framework is designed to help teachers know when to use each group of strategies.

It’s important to remember that when we refer to “strategies” in this module, we are actually referring to “groups” or categories of strategies, as each one has an array of instructional techniques associated with it.

With that being said, let’s begin exploring them.

**Strategies 1-3**

![McREL: Nine Strategies for Effective Instruction](image)

*Creating an Environment for Learning*

1) Setting objectives and providing feedback  
2) Reinforcing effort and providing recognition  
3) Cooperative learning

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**Transcript:**

The first three strategies are:

- Setting objectives and providing feedback  
- Reinforcing effort and providing recognition  

[and:]  
- Cooperative learning

These groups of strategies fall under the larger umbrella of creating an environment for learning. They each describe methods for focusing the learners in your classroom, and creating a classroom culture that facilitates academic growth.
Strategies 4-7

Transcript:

The next groups of strategies include:

- Cues, questions, and advanced organizers
- Nonlinguistic representations
- Summarizing and note-taking

[and:]  
- Assigning homework and providing practice

These four strategies fall under the broader category of **Helping students develop understanding**. They help students activate their background knowledge and use it to scaffold new learning. They also help students make connections between concepts, develop deeper understandings of content, and organize new learning.

Strategies 8-9

Transcript:

Last of all, the final two groups of strategies are:

- Identifying similarities and differences
These strategies are both used to help students **extend and apply knowledge**. The goal is to move students beyond a focus on “getting the right answer” and to a deeper understanding of how the knowledge and skills they are learning work in real-world contexts. For new learning to have value, students must see that it is relevant, useful, and meaningful.

**Common Mistakes**

Before we begin learning about each group of strategies individually, a word of caution: after the nine strategies began to be adopted by schools and school districts across the United States, some disturbing trends emerged. In 2009, McREL published an article identifying three common mistakes associated with the nine instructional strategies described in *Classroom Instruction That Works*.

The first was that some schools and teachers were *only* using these nine strategies for all of their instruction. McREL never meant to present these nine strategies as the totality of effective teaching practice. Instead, they were intended as tools in a teacher’s chest of instructional resources (Marzano, 2009).

The second mistake is **assuming that high-yield strategies must be used in every class**. Teachers must be intentional about which strategy they use, and when. Teaching is context-specific, and McREL wrote that “A specific instructional strategy is effective only when used in the specific situation for which it was designed. This means understanding how and when to use each strategy.” (Marzano, 2009, p. 5).

The last mistake is teachers **assuming that high-yield strategies will always work**. Just because you have your students take notes and summarize on a regular basis does not mean that they’ll ace their achievement tests. As teachers, we have to constantly reflect on what we are doing, why we are doing it, and how students are responding. If a particular strategy is not producing the desired results, we need to think about why, and then try something else (Marzano, 2009).
Common Mistakes

Transcript:

In the upcoming sections, we will examine each category of strategies one at a time, and explore the best practices and common pitfalls associated with it. By the time you finish this module, you will have developed an initial understanding of how and when to use these tools to boost student learning in your class.

Please proceed to the next section, which examines three strategies that can help teachers create an environment for learning.

Strategy 1

Intro

Transcript:

This section addresses strategies for creating an environment for learning.
Setting Objectives and Providing Feedback

Transcript:

The first strategy is setting objectives and providing feedback. Objectives are explicit statements of what students are going to learn or be able to do by the end of a lesson (Dean, Ross Hubbell, Pitler, & Stone, 2012). Objectives, which could also be thought of as lesson-level goals, help to ensure that learning activities are purposeful. Students need to see a clear connection between what they are being asked to do during a lesson, and what they are supposed to learn during a lesson. Otherwise they might fairly ask “Why are you asking me to do this?”

Here are a few guidelines and best practices for setting objectives.

First Guideline

Transcript:

The first is: when you set learning objectives for a lesson, you should make sure that the objective is **specific, but not restrictive** (Dean, Ross Hubbell, Pitler, & Stone, 2012, p. 5). For example, take a look at these three sample objectives:

- SWBAT write persuasively for a specific audience.
- SWBAT describe the “appeal to emotion” persuasive strategy in three sentences or less.

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- SWBAT identify three persuasive strategies, explain their purposes, and use them in a sample piece of writing.

The third objective is an example of a learning goal that is specific, but not restrictive. To hear some additional explanation on why, click “Learn More.” Otherwise, click “Proceed” to move on to the next guideline.

Optional - First Guideline Explanation

Transcript:
The first objective is very broad. A whole BUNCH of knowledge and skills are required to write persuasively, and they can’t all be taught in a single lesson. The second objective is so specific that it might actually be limiting. The scope of a lesson should extend beyond just giving a short description of a single strategy. The last objective is appropriately specific. It describes specifically what students will be able to do by the end of the lesson, but is broad enough to allow for students to build knowledge and engage in higher-order thinking.

Second Guideline

Transcript:
The second guideline is: an objective should be stated in terms of what students are going to learn, not what
activities they are going to complete. Take a look at these two examples:

- SWBAT analyze the political and economic effects of the Stamp and Tea Acts on the British colonies.
- Read pages 77-92 and answer the questions about the Stamp and Tea Acts.

The first is an example of an appropriate objective, while the second is not. This is because the ultimate goal of a lesson should always be student learning, not activity completion.

**Third Guideline**

Transcript:

The third guideline is: communicate learning objectives explicitly to your students. Your students should always know what they are learning and why they are being asked to perform a particular task.

In practice, this might look like taking the time to discuss and build investment around the day's learning goals at the beginning of a lesson, rather than merely having the objective written on the board and not referencing it.

**Feedback**

Transcript:

“Setting objectives and providing feedback” is a strategy that has two parts. We’ve discussed the first part -
setting objectives - so let's now discuss the second.

What do we mean by feedback? Feedback is explicit guidance that helps students adjust their learning (Dean, Ross Hubbell, Pitler, & Stone, 2012). Feedback can and should be given throughout a lesson. It can be given on a student's response to teacher or student-initiated questions, or while students are practicing. When giving feedback to students, it is important to remember these important criteria.

First, good feedback is specific. It identifies what is correct, and also elaborates on what students should do next.

Second, good feedback is provided in time to address student needs. The best feedback is the kind that students can use “just-in-time” to improve a product or increase understanding

Third, feedback should be criterion-referenced, which means that it should be based upon a clear vision of student mastery.

**Feedback Tip**

Transcript:

Finally, here’s a tip: you can teach your students how to provide high-quality feedback to one another. This happens through explaining the purpose behind feedback, and explicitly modeling what high-quality feedback looks like.

**Pitfalls**
Transcript:

Before we move on, here are a few pitfalls to avoid when giving feedback. Click on any of these pitfalls to learn more about it. When you are ready, click “Proceed” to move on to the next strategy.

**Pitfalls: Too General**

Some teachers make the mistake of giving feedback that is too general, and saying things like “Good job” or “Nice work.” These kinds of generic compliments don’t tell students what they are doing well, or what steps to take to improve.

**Pitfalls: Unclear**

In order to give high-quality feedback, the teacher needs to fully understand the objective he or she is teaching, and have a clear vision for what it will look like for students to master it. This could involve looking at exemplars of high quality work, or teaching students the rubric that will be used to evaluate their work.
Pitfalls: Not Timely

Transcript:

Students should get feedback on what high-quality work looks like before they are assessed. Remember: feedback is far less useful if it is given after the point that students can use it to make changes or revisions.

Strategy 2

Intro

Transcript:

The second McREL strategy is reinforcing effort and providing recognition. This strategy relates to student motivation, which involves how much effort students are willing to expend, as well as how long they are willing to continue working when the learning or the task gets challenging.

Reinforcing effort and providing recognition can affect things like:

- **Self-efficacy**, a student’s beliefs about his or her competence.
- **Attributions**, which are a student’s beliefs about what causes academic success or struggle, AND
- **Task value**, which is what students believe about the relevance or reasons for doing a task.

**Reinforcing Effort**

When teachers **reinforce effort**, they highlight the connection between what a student does in and outside of class, and what that helps him to learn and achieve. Two strong practices for reinforcing effort include:

- Teaching students about the relationship between **effort** and **achievement**, AND

- Providing students explicit guidance about what it means to expend effort in different academic situations. In other words, talking about which actions and behaviors demonstrate strong effort for different academic tasks (Dean, Ross Hubbell, Pitler, & Stone, 2012).

**Providing Recognition**

Providing recognition can be thought of as giving intentional and meaningful **praise**. Praise has positive effects on student learning and achievement if it is **sincere** and if it promotes **self-determination**. This means that the praise causes students to attribute their performance to things they can control, like how hard they studied or how many questions they asked.
However, praise can be ineffective or harmful if it is person or ability-oriented. This type of praise can be seen in expressions like:

- “You had the second-highest score in the class” or
- “You’re really good at…”

This type of praise might cause the student to attribute his performance to unchangeable internal attributes (like, “I’m naturally good or not good at math”), or to care more about how he compared to peers than his actual mastery of the content.

**Pitfalls and Best Practices**

**Transcript:**

To avoid these pitfalls, here are a few best practices to remember when using praise (Dean, Ross Hubbell, Pitler, & Stone, 2012):

- Give praise that promotes a mastery-goal orientation. This is giving praise on progress toward goals, rather than performance relative to peers.
- Praise should be **specific** and **aligned with expected performance**.

And finally

- Praise should be **simple and direct**. If praise is super-exaggerated, students may feel that it is insincere and dismiss it.
Strategy 3

Cooperative Learning

Let’s finish with a discussion of the final strategy in this section: cooperative learning. Students learn through social interaction, and the ability to talk and process with peers leads to deeper understanding. Just as students will not be able to work in isolation when they begin jobs and careers, we cannot expect them to learn in isolation either.

At the same time, cooperative learning is more than just “putting students in groups.” Many teachers make the mistake of arbitrarily assigning students to groups and then expecting them to work together constructively. In reality, cooperative learning requires careful planning and facilitation on the part of the teacher.

Components Cooperative Learning

There are two necessary components for cooperative learning (Dean, Ross Hubbell, Pitler, & Stone, 2012):

- The first is positive interdependence: this is designing group roles and tasks in such a way that the success of an individual promotes the success of the group. It also means that each student should be responsible for an equal share of the workload.
- The second is **individual accountability**: each member of the group should get clear feedback on how his or her own effort contributed to the overall goal. The teacher must also think about how individual group members will demonstrate proficiency with the skills the cooperative learning was designed to facilitate.

If you’d like to learn more about different types of groups that can be used in cooperative learning, click “Learn More.” Otherwise, click “Proceed” to learn about some best practices associated with cooperative learning.

**Optional - Types of Grouping**

- **Informal** - these are informal, ad hoc groups that teachers can use to have students process new learning or engage in practice. Examples include things like think-pair-share or turning to a shoulder partner.
- **Formal** - formal groups are usually organized around a larger assignment or task, and can last for days or even weeks.
- **Base Groups** - these are groups designed to provide students support over an extended period of time, like a semester or a year.
Best Practices

Transcript:

Some teachers are reluctant to use cooperative learning because of concerns about classroom management, or a perceived need to keep the class “under control.” While these concerns may be valid, there are some best practices that teachers can use to ensure that cooperative learning is well-managed, and that it leads to positive outcomes for all students.

First, keep group sizes small. In general, groups should contain no more than five students.

Second, groups should be used consistently and systematically. Kids are far more likely to respond favorably to cooperative learning if it is well-organized and used on a regular basis, rather than only sporadically.

Third, teachers must explicitly teach - and have students practice - the structures and processes they will follow when working in cooperative groups. There should be clear directions for how students are expected to move into and out of groups, and norms for how they are expected to behave while in their groups. All of these should be taught and modeled.

Finally, groups must be organized around a well-structured task with clearly defined learning goals, and specific roles for each member. Group tasks should be interesting, and promote the kind of cognitive conflict - or disagreement - that cause students to share their ideas with one another.
Recap of 1-3

Transcript:

Let’s pause to recap the three instructional strategies associated with creating an environment for learning. They are:

· Setting objectives and providing feedback
· Reinforcing effort and providing recognition

[and:]  
· Cooperative learning

Each of these are broad strategies that describe an array of techniques that teachers can use to invest students and help them take ownership over their learning.

Please proceed on to the next section to learn about four strategies designed to help students develop understanding.

Strategy 4

Intro

Transcript:
All of the strategies that will be explored in this section are connected to the larger goal of helping students develop understanding.

**Cues, Questions, and Advanced Organizers**

The first category of strategies is using cues, questions, and advanced organizers. Teachers can use all three of these tools to help students access prior knowledge and use it as a bridge to new learning.

Let's talk about cues and advanced organizers first, since they are closely related. Cues are hints about the content of an upcoming lesson. They are used to set the stage for learning, and build student anticipation (Dean, Ross Hubbell, Pitter, & Stone, 2012). Advanced organizers include a range of tactics that help students use background knowledge to learn new information, or otherwise draw their attention to important ideas (Dean, Ross Hubbell, Pitter, & Stone, 2012). Examples of advanced organizers include:

- Brief stories that hook student interest, and situate concepts within a narrative.
- Pictures or other images that are associated with knowledge or concepts.
- Music, film, or video.

[and:]  
- Previews of the activities and what will be learned in the upcoming lesson.
Question Levels

Transcript:

When it comes to questions, there are actually four different levels. Using a tiered questioning strategy helps to build student vocabulary, organize information in memory, and build verbal reasoning skills (Dean, Ross Hubbell, Pitler, & Stone, 2012).

Click on any level to learn more about these types of questions. When you are ready, click “Proceed” to learn about best practices associated with cues, questions, and advanced organizers.

Question Level 1

Transcript:

- LEVEL 1 questions ask students to name or identify objects, events, or concepts, and are used to build students’ conceptual vocabulary (Dean, Ross Hubbell, Pitler, & Stone, 2012). For example:
  - What is an isosceles triangle?
  - Which different groups were involved in the American Revolutionary War?
Question Level 3

Transcript:

- LEVEL 3 questions require higher-order thinking, and require students to *elaborate* on information, or link it to what they already know (Dean, Ross Hubbell, Pitler, & Stone, 2012). For example:
  - If I have a triangle with two acute angles, what must be true about the remaining angle? Why?
  - What similarities exist between Great Britain’s involvement in the Revolutionary War and the United States’ involvement in the Vietnam War?

Question Level 2

Transcript:

- LEVEL 2 questions ask students to *organize* and *classify* information (Dean, Ross Hubbell, Pitler, & Stone, 2012). For example:
  - Which of the following triangles are isosceles? How did you know?
  - Was the American Revolution an example of modern or pre-modern warfare? Why?
Question Level 4

Transcript:

LEVEL 4 questions move to the abstract level and ask students to reflect on and refine their perceptions about concepts (Dean, Ross Hubbell, Pitler, & Stone, 2012). For example:

- What are the relationships between the sides of various types of triangles, and the angles opposite those sides?
- Whose interests were served in the Revolutionary War? Whose were not?

Best Practices

Transcript:

Here are some best practices associated with cues, questions, and advanced organizers (Dean, Ross Hubbell, Pitler, & Stone, 2012, P. 52).

- First, use these strategies to focus students on what’s important.
- Second, use explicit cues to bring to mind relevant experiences and background knowledge.
- Third, ask inferential questions where students need to draw upon background knowledge to “fill in the blanks.”
- Finally, ask analytical questions. These are LEVEL 4-type questions that ask students to analyze errors,
analyze different perspectives, construct support, and identify faulty logic.

One word of caution. When using the strategy of asking questions, it is important to plan out questions in advance. It’s often difficult to think of well-crafted inferential or analytical questions “in the moment.” Some teachers have even found it helpful to create “question stems” for literal or inferential questions and post them as an anchor chart in their classrooms.

**Strategy 5**

**Intro**

Transcript:

Let’s move on to our next major strategy: nonlinguistic representations

One way to think about nonlinguistic representations is “representing knowledge as images” (Dean, Ross Hubbell, Pitler, & Stone, 2012, p. 64). Nonlinguistic representations operate from the theory that information is either stored in the memory as words or images.

There are five common tools associated with nonlinguistic representations (Dean, Ross Hubbell, Pitler, & Stone, 2012, p. 64):

1. Graphic organizers
2. Physical models and manipulatives
3. Visualizing
4. Pictures and illustrations
5. Kinesthetic activity

Click on any of these tools to learn a little bit more about them. When you are ready, click “Proceed” to learn about some best practices for using nonlinguistic representations.
Graphic Organizers

Graphic organizers are shapes and drawings that help students to organize information conceptually. There are hundreds, if not thousands, of different graphic organizers that teachers could use for different purposes. The important thing for a teacher is to explicitly model and teach students how to use a graphic organizer before using it for the first time.

Pictures and Illustrations

Either using or having students create pictures and illustrations can allow students to represent their learning in ways that are personally meaningful to them.
**Physical Models and Manipulatives**

Transcript:

Physical models and manipulatives are physical objects that students can use to either represent or practice with a concept.

**Visualizing**

Transcript:

Visualizing involves creating mental images to associate with an idea or concept. To help students visualize, teachers can provide details that help students incorporate sounds, smells, tastes, and visual details.
**Kinesthetic Activity**

Transcript:

Kinesthetic activity engages students in physical movement while they are in the process of learning. Being able to associate movements with concepts helps to codify information in the brain.

**Best Practices**

Transcript:

Nonlinguistic representations help students to either elaborate on or add to existing knowledge. They also can and should be used in combination with other activities. For example, a teacher might teach students how to use a graphic organizer to take notes on a particular concept.

Here are a few best practices to remember when using nonlinguistic representations.

First, before asking students to use or create a nonlinguistic representation, it is important to model either through demonstrations or think-alouds.

Provide students a variety of opportunities to use nonlinguistic representations, and also model how they can use more than one as they learn a new concept or term. For example, a teacher might first ask students to mentally visualize a character from a story, and then work together to use a series of objects to represent his attributes and characteristics.
Last of all, a strong practice is to teach students how to use nonlinguistic representations like graphic organizers as a tool for other strategies, such as hypothesizing, summarizing, or note-taking.

**Strategy 6**

**Intro**

Summarizing and Note-Taking

- Most effective in lessons that focus on new academic content.
- Teachers should provide guidance and modeling.


**Transcript:**

Summarizing and note-taking actually make up the next strategy we’re going to talk about. Summarizing involves sorting, selecting, and *combining* information; note-taking involves sorting, coding, and *accessing* information (Dean, Ross Hubbell, Pitler, & Stone, 2012).

Summarizing and note-taking are most effective in lessons that focus on new academic content. It’s important to not make the mistake of assuming that students already *know* how to effectively summarize or take notes on their own. Students need explicit guidance and modeling.

In _Classroom Instruction That Works_, McREL describes an approach to summarizing that consists of the following steps. Take a moment to read them (Dean, Ross Hubbell, Pitler, & Stone, 2012, p. 80).

1. Take out the stuff that’s not important to understanding.
2. Take out words that repeat information.
3. Replace a list of things with one word that describes them.
4. Find or create a topic sentence.

The teacher could model a process like this for students, and then have them engage in teacher-guided practice. A teacher could also create summary frames for students, which present a series of questions designed to highlight the critical elements in a specific text.
Note-taking Strategies

Transcript:

When it comes to note-taking, no single format is correct. However, there are some strategies that teachers can use to help students take notes effectively (Dean, Ross Hubbell, Pitler, & Stone, 2012, p. 93):

- The first is to help students create notes as the information is presented. Show students how to organize their notes, and draw their attention to important concepts.

- Consider providing a template or graphic organizer for students to use when taking notes. Make sure to model for students how they are supposed to use it.

- Finally, teach students a variety of note-taking formats so that they may use the one that works best for them. Formats might include:
  
  - Webbing: using shapes, colors, and arrows to show relationships.
  
  - Informal outlining: creating headings with big ideas and concepts and using bullet points or other marks to record more specific supporting information.
  
  - Combination Transcript: creating notes that use both linguistic and non-linguistic representations.

There are also more formal note-taking strategies such as Cornell Notes and thinking maps. Each of these strategies is appropriate in different situations if it is explained and modeled appropriately.
Strategy 7

Intro

Transcript:
The final strategy associated with helping students develop understanding is assigning homework and providing practice.

Practice means giving students opportunities to develop proficiency with new skills and processes. There are myriad ways that teachers can have students practice. Here are three broad guidelines to keep in mind as you plan practice activities for your students. Click on any of these three guidelines to learn about it in greater depth. When you are ready, click “Proceed” to learn about best practices for using homework.

Explain the Purpose

Transcript:
Let students know what they are practicing and why. Students are far more likely to stay engaged in practice activities if they understand their purpose and intended outcomes (Dean, Ross Hubbell, Pitler, & Stone, 2012).
**Distribute Practice Over Time**

Transcript:

Practice sessions should be short and distributed over time. They can target a specific sub-skill, or an integrated group of skills. Just remember to check for conceptual understandings before releasing students to practice independently (Dean, Ross Hubbell, Pitler, & Stone, 2012). For example, if a student is being asked to solve a series of math problems that involve subtracting fractions with unlike denominators, they first need to understand WHY it is necessary to find a common denominator before subtracting.

**Give Feedback, Don't Grade**

Transcript:

Formative practice should not be graded. Students should be given feedback, not grades, when they are engaged in a process of practicing to learn.
Homework

**BEST PRACTICES**

- Align homework to learning objective.
- Explain purpose and rationale.
- Ensure students can complete independently.
- Provide feedback.
- Differentiate homework assignments.
- Don't spend a lot of class time checking homework.


Transcript:

Let’s talk about homework. One way to think of homework is as additional practice that students complete outside of school.

Homework sometimes gets a bad rap because teachers don’t use it appropriately. Here are some tips for making sure that your use of homework is as beneficial as possible for your students.

**Homework Best Practices**

**BEST PRACTICES**

- Align homework to learning objective.
- Explain purpose and rationale.
- Ensure students can complete independently.
- Provide feedback.
- Differentiate homework assignments.
- Don't spend a lot of class time checking homework.


Transcript:

1. First, homework should be aligned to the objective that was studied in class that day. Never use homework to take the place of instruction on a given topic.

2. Second, always explain the purpose or rationale behind the homework assignment.

3. Third, check to ensure that students are able to perform the required tasks of the assignment independently. Homework is useless if students cannot complete it on their own.

4. Fourth, it is far more productive to give feedback on homework assignments rather than grades. If you do not have time to give students feedback on all of their homework assignments, you should either reconsider how that feedback is being provided (and teach students how to give one another feedback on homework), or you should reconsider how much homework is being assigned.
5. Fifth, giving the same homework assignment to all students is not always productive. Students might need different amounts of practice with the same concept, or the same amount of practice with different concepts.

6. Finally, using class time to check homework has been found to either be uncorrelated or negatively correlated with student achievement.

Recap

Transcript:

Before we conclude, let’s pause to recap the four instructional strategies associated with helping students develop understanding. They are:

- Using cues, questions, and advanced organizers
- Nonlinguistic representations
- Summarizing and note-taking
- Assigning homework and providing practice

[and:]
- Assigning homework and providing practice

Each of these strategies are tools that can help students develop, manipulate, and codify their knowledge. Please proceed to the final section in this module, where you will learn two strategies for helping students extend and apply knowledge.
Strategy 8

Introduction

Transcript:

This section addresses two final categories of strategies, both of which are designed to help students extend and apply knowledge. We will explore the purpose behind each of these strategies, as well as processes that teachers can use to operationalize them in the classroom.

Identifying Similarities and Differences

Transcript:

The first is identifying similarities and differences. This is a powerful group of strategies that leads students to higher levels of thinking and conceptual understanding. Identifying similarities and differences helps us to make sense of the world around us and leads us to important questions like “Why is this like that?”

There are four sub-strategies associated with identifying similarities and differences. Click on any strategy to learn more about it, and see a process for teaching students how to do it. When you are ready to move on, click “Proceed.”
Comparing and Contrasting

Transcript:

In *Classroom Instruction That Works*, McREL notes that when teaching these sub-strategies, it is sometimes helpful to create a process for students to follow, and then model that process. For example, a process for comparing and contrasting might look like this (Dean, Ross Hubbell, Pitler, & Stone, 2012, p. 122):

1. Select the items to compare.
   
   *Let’s say that we’re comparing two systems of government: democracy and oligarchy.*

2. Identify which characteristics of the two items to base the comparison on.
   
   *In this example, I could have students compare based on characteristics like “Which group has the most political power” or “Degree of public participation in government.”*

3. Ask students to explain how the two things are similar or different based on those characteristics.
   
   *I could ask the question, “Which groups of people have more or less power under each system of government?”*

Classifying

Transcript:
Classifying is the process of organizing things into groups. One process for teaching students how to classify could look like this (Dean, Ross Hubbell, Pitler, & Stone, 2012, p. 124):

1. Identify the items to classify.
   
   *Let’s say that I’m trying to sort polygons into different categories.*

2. Next, select an item, identify its key attributes, and then identify other items with those same attributes.
   
   *I want to identify different polygons that all have four sides. This could include shapes like rectangles, squares, parallelograms, trapezoids, and so on.*

3. Now, we can create a category based on the attribute that items must have for membership.
   
   *My category could be called “Quadrilaterals.”*

4. From here, I could combine categories or split into smaller categories.
   
   *For example, now I’m looking for shapes with four sides that contain four right angles*

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**Creating Metaphors**

**Transcript:**

We use metaphors to understand how two items are similar on an abstract level. To create metaphors, we could teach students a process like this (Dean, Ross Hubbell, Pitler, & Stone, 2012, p. 126-127):

1. Identify the most basic or important elements of a situation or thing.
   
   *Let’s say that I’m teaching about the difference between RAM and hard drive space. The amount of RAM determines how many operations I can have running on my desktop at the same time. The number of gigabytes in my hard drive determines how much long-term storage space my computer has.*

2. Write the basic information as a general pattern by replacing words for specific things with words for more general things.
   
   *) RAM is how much “stuff” can be open at one time; hard drive is long-term storage.

3. Lastly, try to find a different situation to which this same pattern applies.
   
   *) The RAM on your computer is your “desk.” The size of your desk at home or at school determines how much stuff you can have out and be working on at one time. Your hard drive is your file cabinet, and its...*
Creating Analogies

Transcript:

Analogies show relationships between relationships. In order to be an effective instructional tool, at least one pair of relationships in the analogy needs to be familiar. Some steps might look like this (Dean, Ross Hubbell, Pitler, & Stone, 2012, p. 126-127):

1. Identify how the first two items in the first pair of things is related.
   
   Let’s say that I’m looking at the role of parentheses in the order of operations. Parentheses is the first thing I do.

2. Next, state the relationship.
   
   Solving what’s inside parentheses is the first step of the order of operations.

3. Last, identify another pair of things that has a similar relationship.
   
   Well, I could think about driving. Putting the key in the ignition is the first thing I do to start driving, just like solving what’s inside parentheses is the first thing I do in the order of operations.

A good instructional strategy is to provide a complete analogy and ask students to explain the relationships. For example:

PARENTHESES:ORDER OF OPERATIONS :: PUTTING KEY IN IGNITION: DRIVING

You could also present an analogy that’s missing an item, and ask students to apply it. For example, PARENTHESES:ORDER OF OPERATIONS :: ________:DRIVING
Best Practices

Identifying Similarities and Differences

- Select the strategy that fits the experience.
- Model the strategy prior to students practicing.
- Strategies should be used to teach academic objectives, not as objectives.

Transcript:

When using the strategy of identifying similarities and differences, always make sure to select the strategy that fits the learning experience. For example, you might use metaphors and analogies when you want students to understand abstract ideas, and make connections between new and prior knowledge.

No matter what, remember to model the strategy prior to having students engage in practice.

Last of all, one important point of clarification. We use the identifying similarities and differences strategies to teach academic objectives - they are not necessarily an end in themselves. For example, the end goal for a lesson may not be for students to compare and contrast - it is to better understand two things through comparing and contrasting.

Strategy 9

Introduction

Generating and Testing Hypotheses

Transcript:

The last of McREL's nine categories of strategies is generating and testing hypotheses. Really, this involves teaching students to ask the question “What If…?” to make an educated guess about the answer to that question, and then to test it out.
Generating and testing hypotheses requires students to analyze and evaluate, and to think deeply about the causes behind, and relationships among different phenomena.

It’s important to note that generating and testing hypotheses is not just a “science thing.” It can be done in all content areas, and is a powerful tool for student engagement.

**Problem Solving**

One way that teachers can have students generate and test hypotheses is by engaging them in a process of problem-solving. In *Classroom Instruction That Works*, McREL suggests a process that looks like this (Dean, Ross Hubbell, Pitler, & Stone, 2012, p. 140):

1. Identify a goal.
2. Describe barriers or constraints.
3. Identify different solutions and hypothesize which one will work.
4. Try out the solution.
5. Explain whether the hypothesis was correct.

This process could be followed in traditional ways, like solving math problems or science experiments, but could be applied to other content areas as well. For example, a language arts teacher could engage students in this process with goals like “reducing the total number of grammar and spelling errors in writing assignments” or “improving the quality of references used in research.” Students can be given ownership of the problem-solving approach and apply it to problems that matter to them, like “reducing the number of students who drop out of high school,” or “improving relationships between students and faculty.”
Investigations

Transcript:

Teachers can also engage students in investigations. Investigations involve identifying or resolving issues regarding past events for which there are confusions or contradictions.

To learn about how teachers could use investigations as a way of having students generate and test hypotheses, click “Learn More.” Otherwise, click “Proceed” to learn about general best practices associated with generating and testing hypotheses.

Optional: Engaging Students in Investigations

Transcript:

To engage students in an investigation, teachers might have them follow a process like this (Dean, Ross Hubbell, Pittler, & Stone, 2012, p. 144):

1. Identify the situation.
2. Identify what is known or agreed upon about the situation.
3. Offer a hypothetical scenario, based on what you understand and know.
4. Analyze evidence to determine if that hypothetical scenario is plausible.
Examples of questions that prompt investigations could be things like “Could the cleanup of the oil spill off the Gulf Coast have been handled differently?” or “Was the dropping of the two atomic bombs over Hiroshima and Nagasaki necessary?”

**Best Practices**

**BEST PRACTICES**

**Generating and Testing Hypotheses**

- Model a strategy before having students do it.
- Provide resources.


**Transcript:**

The big idea behind having students generate and test hypotheses is to move them away from “right-answer learning,” where students are rewarded for arriving at a single pre-determined answer. When engaging this strategy, there are a few important things to remember:

- First, the strategy needs to be modeled.
- Second, students need resources to engage in generating and testing hypotheses. This might include graphic organizers or sentence frames that can help them to organize their thinking. It also could include the teacher pointing them in the direction of resources that provide evidence that could help them establish and test out hypotheses.
- Last of all, teachers must provide guidance to students during each stage of the process. They do this by incorporating other strategies from the McREL nine which include asking strategic questions, providing cues to students on where to focus their attention, and giving timely feedback.
Conclusion

Transcript:

This concludes the module on McREL’s nine strategies for effective instruction. Here they are, one last time.

You have now developed some basic knowledge about each of these strategies, and learned best practices for applying them in your classroom. For more detailed information about these strategies, their sub-strategies, and implementation ideas, check out the book *Classroom Instruction That Works*.

And be sure to avoid some of the misconceptions and pitfalls that we discussed in these modules. Most of all, make sure that any strategy you choose is aligned to the goal of the lesson in which you’re using it.

And of course, any time you use one of these strategies take the time to reflect on what went well, and what you can do to make it work better next time.