

RESEARCH-BASED INSTRUCTIONAL STRATEGIES

Researchers at Mid-continent Research for Education and Learning (McREL) have identified nine instructional strategies with high effect sizes that are most likely to improve student achievement across all content areas and across all grade levels. These strategies are explained in the book *Classroom Instruction That Works* by Robert Marzano, Debra Pickering, and Jane Pollock. Listed in order of highest to lowest effect size, the strategies are:

1. Identifying similarities and differences
2. Summarizing and note taking
3. Reinforcing effort and providing recognition
4. Providing homework and practice
5. Using both linguistic and nonlinguistic representations
6. Incorporating cooperative learning
7. Setting objectives and providing feedback
8. Generating and testing hypotheses
9. Using cues, questions, and advance organizers.

1. Identifying Similarities and Differences

The ability to break a concept into its similar and dissimilar characteristics allows students to understand (and often solve) complex problems by analyzing them in a more simple way.

2. Summarizing and Note Taking

These skills promote greater comprehension by asking students to analyze a subject to expose what's essential and then put it in their own words. According to research, this requires substituting, deleting, keeping some things, and having an awareness of the basic structure of the information presented. Research shows that taking more notes is better than fewer notes, though verbatim note taking is ineffective because it does not allow time to process the information. Teachers should encourage and give time for review and revision of notes. Notes can be the best study guides for tests.

3. Reinforcing Effort and Providing Recognition

Effort and recognition speak to the attitudes and beliefs of students, and teachers must show the connection between effort and achievement. Research shows that although not all students realize the importance of effort, they can learn to change their beliefs to emphasize effort. According to research, recognition is most effective if it is contingent on the achievement of a certain standard. Also, symbolic recognition works better than tangible rewards.

4. Providing Homework and Practice

Homework provides students with the opportunity to extend their learning outside the classroom. However, research shows that the amount of homework assigned should vary by grade level and that parent involvement should be minimal. Teachers should explain the purpose of homework to both the student and the parent or guardian, and teachers should try to give feedback on all homework assigned. Research shows that students should adapt skills while they're learning them. Speed and accuracy are key indicators of the effectiveness of practice.

5. Using Both Linguistic and Nonlinguistic Representations

According to research, knowledge is stored in two forms: linguistic and visual (nonlinguistic). The more students use both forms in the classroom, the more opportunity they have to achieve. Recently, use of nonlinguistic representation has proven to not only stimulate but also to increase brain activity.

6. Incorporating Cooperative Learning

Research shows that organizing students into cooperative groups yields a positive effect on overall learning. When applying cooperative learning strategies, keep groups small and don't overuse this strategy—be systematic and consistent in your approach.

7. Setting Objectives and Providing Feedback

Setting objectives can provide students with a direction for their learning. Goals should not be too specific; they should be easily adaptable to students' own objectives. Research shows that feedback generally produces positive results. Teachers can never give too much; however, they should manage the form that feedback takes.

8. Generating and Testing Hypotheses

Research shows that a deductive approach (using a general rule to make a prediction) to this strategy works best. Whether a hypothesis is induced or deduced, students should clearly explain their hypotheses and conclusions.

9. Using Cues, Questions, and Advance Organizers

Cues, questions, and advance organizers help students use what they already know about a topic to enhance further learning. Research shows that these tools should be highly analytical, should focus on what is important, and are most effective when presented before a learning experience.