

1R.3**Instructional Strategies That Increase Student Learning**

In 2001, Robert Marzano, Debra Pickering and Jane Pollock published *Classroom Instruction that Works: Research-Based Strategies for Increasing Student Achievement* (ASCD, Alexandria, VA). Research shows that teachers and the instructional strategies they use are the most significant factors in affecting student learning. The authors describe nine instructional strategies that increase student learning.

1. *IDENTIFYING SIMILARITIES AND DIFFERENCES* is basic to all thought and may be the core of learning. Classifying and creating metaphors or analogies are included in this strategy. The use of Venn diagrams, comparison matrices, and graphic organizers are suggested as tools for identifying similarities and differences.
2. *SUMMARIZING AND NOTE TAKING* are the two most important academic skills. Summarizing requires students to delete some information, keep some information and substitute other information. To make such decisions, students must analyze information at a deep level. Note taking is related to summarization because students must determine what is significant. There is no one correct way to take notes, but several formats including webbing are suggested.
3. *REINFORCING EFFORT AND PROVIDING RECOGNITION* does not address cognitive skills but is aimed at student attitudes and beliefs. Students who understand the relationship between effort and achievement can increase their achievement. Rubrics help students track their effort and evaluate their achievement. A distinction is made between praise and recognition. Recognition is effective when students reach a specific performance level or learning goal.
4. *HOMEWORK AND PRACTICE* should be assigned for specific purposes such as to practice, prepare for new material, or elaborate familiar concepts. Students should know the purpose and the expected outcome. Varying the types of feedback is essential to making homework meaningful. Another concern is for the *proper amount* of homework relative to student age and grade level. Parents should be encouraged to facilitate homework not help or do.
5. *NONLINGUISTIC REPRESENTATIONS* are the mental pictures or physical sensations such as sound, smell, taste, touch and kinesthetic associations. Students who engage in nonlinguistic work have increased brain activity that stimulates deeper learning. Such work includes creating graphic representations, making physical models, generating mental pictures, drawing pictures and pictographs, and engaging in kinesthetic activity.

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6. *COOPERATIVE LEARNING* requires five specific elements to be successful: Positive interdependence; we swim or sink together. Face-to-face interaction; we help each other to learn. Individual and group accountability; each of us must contribute to reach goals. Interpersonal and small group skills; we practice decision making and share leadership. Group processing; we reflect on how well we did and how we could do better. Group sizes should be kept small (3 or 4 students) and should not be ability based. While cooperative learning should not be overused, it is the most powerful of all classroom-grouping strategies.
7. *SETTING OBJECTIVES AND PROVIDING FEEDBACK* encourages a *metacognitive* system of thinking and establishes a direction for student learning. Instructional goals help students focus. Goals should not be too specific, and students should personalize the teacher's instructional goals. The best feedback provides the student with an explanation of when the knowledge or skill is correct and accurate as well as when it is incorrect or inaccurate.
8. *GENERATING AND TESTING HYPOTHESES* is the most powerful of the cognitive operations and requires the application of knowledge. For cognition and application to occur, students must generate and explain their hypotheses and conclusions. Six tasks that require hypothesis generation and testing include system analysis, problem solving, historical investigation, invention, experimental inquiry and decision making.
9. *CUES, QUESTIONS, AND ADVANCE ORGANIZERS* activate prior knowledge. They prepare students for new knowledge before they experience it, which is critical to learning. Questions and cues before the learning experience help students focus on what is important. "Higher level" questions or cues require students to analyze as they learn. Examples of advance organizers include stories to introduce a concept or topic, summaries of information to introduce specific elements of a concept or topic, or graphic organizers such as maps or webs. Skimming a chapter before reading is also an advance organizer strategy.