



In his *What Works in Schools* research, Robert J. Marzano identifies teacher-level factors which influence student academic achievement.

Teachers will:

Begin their instructional units by...

- Presenting students with clear learning goals.
- Asking students to identify personal learning goals that fit within the learning goals presented by the teacher.

Prior to presenting new content...

- Ask students questions that might help them recall what they might already know about the content.
- Provide students with direct links with previous knowledge or studies.

Organize students into ...

- Groups based on their understanding of the content when appropriate.
- Cooperative groups when appropriate.

Ask students to...

- Construct verbal or written summaries of new content.
- Take notes on new content.
- Represent new content in nonlinguistic ways (e.g., mental image, picture, pictograph, graphic organizers, physical model, enactment).
- Revise and correct errors in their notes as a way of reviewing and revising content.
- Revise and correct errors in their non-linguistic representations as a way of reviewing and revising content.

Systematically...

- Provide students with specific feedback on the extent to which they are accomplishing learning goals.
- Ask students to keep track of their own performance on the learning goals.
- Recognize students who are making observable progress toward the learning goals.
- Provide ways for students to organize or think about the content (e.g., use graphic organizers).

Prescribe in-class and homework assignments that require students to...

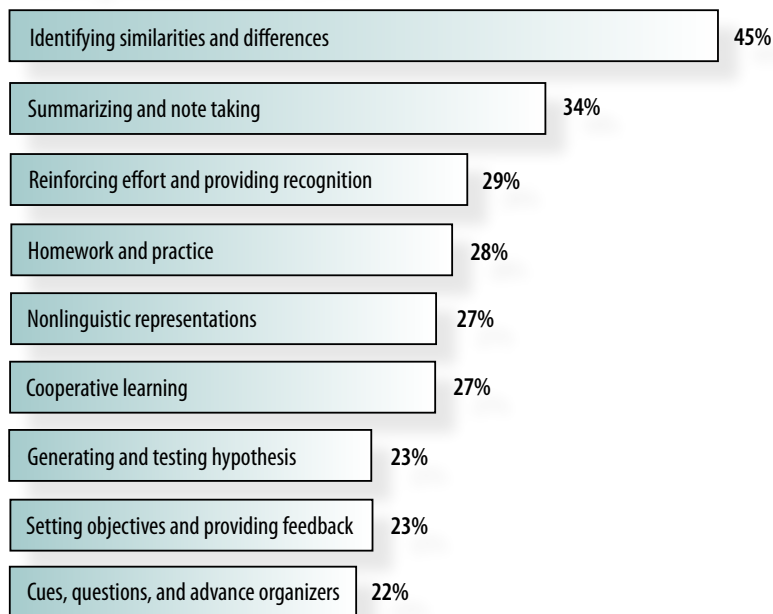
- Practice important skills and procedures.
- Compare and classify content.
- Generate and test hypotheses regarding content.
- Construct metaphors and analogies.
- Emphasize the importance of effort.
- Provide specific feedback on the homework assigned to students.

End their instructional units by...

- Providing students with clear feedback on the learning goals.
- Asking students to assess themselves relative to the learning goals.
- Recognizing and celebrating progress on the learning goals.

Marzano's *Classroom Instruction that Works* research also identifies nine (9) research-based strategies (Figure 1.) which are proven to improve student achievement. These nine strategies are also embedded in the 24 teacher-level factors noted previously.

Figure 1. Strategies and Percent Gains



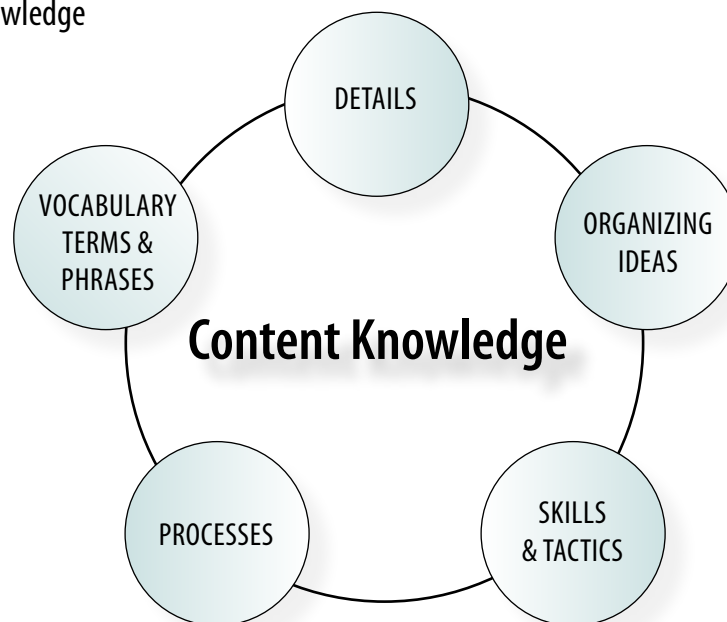
In a broader sense, there are three related areas in effective pedagogy: instructional strategies, classroom management techniques, and classroom curriculum design.

As we look at the effects of instructional strategies on student achievement, teachers must know:

- Their content as it relates to the Texas Essential Knowledge and Skills (TEKS);
- How to integrate information from a variety of resources to design and deliver quality lessons;
- Their students and how they learn; and
- How and when to use appropriate instructional and assessment strategies.

Content knowledge may be organized into five broad categories (Figure 2.): vocabulary terms and phrases, details, organizing ideas, skills and tactics, and processes (Marzano, Pickering, & Pollock, 2001). The first category, **vocabulary terms and phrases**, is linked with findings about intelligence, one's ability to comprehend new information, and one's level of income. Systematic vocabulary instruction is a critical aspect of the entire instructional program. Strategies for teaching vocabulary are addressed in *Building Academic Vocabulary* by Marzano and Pickering (2005).

Figure 2. Content Knowledge



The second category, **details**, includes facts, time sequences, cause/effect relationships, and episodes. If students are to remember and use details later, multiple exposure to details over short increments of time are necessary.

The third category, **organizing ideas**, refers to ensuring that students understand generalizations and principles. Students should be able to clearly articulate statements of generalizations and principles, including providing numerous examples and clear misconceptions about them.

When thinking about the next category, **skills and tactics**, note that mental skills may be divided into different forms: tactics and algorithms (Snowman & McCown, 1984). Tactics are general rules

governing an overall flow of execution, rather than a set of steps that must be performed. Reading maps and graphs are examples of tactic mental skills. Algorithms, on the other hand, are mental skills that have specific outcomes and steps, e.g., mathematical algorithms or steps for solving problems. If we expect students to increase their academic skills and tactics, they must engage in practice that gradually moves to results represented by levels of automaticity. In addition, the interval between practice sessions should move from daily to periodic as the skill level increases.

The last category, **processes**, involves providing a general model of the overall components and subcomponents of the processes. For example, an overall process may be *The Writing Process* and its subcomponents are prewriting, writing, revising, etc. When planning units of instruction, teachers must make a clear distinction between skills and processes that are to be mastered versus skills and processes that are to be experienced but not mastered. When learning complex processes, students need guidance and perhaps modeling of the overall process and its subcomponents. The subcomponents are then practiced as smaller pieces, rather than in isolation, making explicit connections back to the overall process. Marzano's book, *Classroom Instruction That Works*, provides further details about each of the five broad categories, including implications for effective planning and delivery of instruction.