Researched Strategies for Successful Instruction

A good book to read about teaching strategies that lead to maximum gain in student learning and therefore that lead to a higher growth score is Classroom Instruction that Works (2012). For maximum effectiveness, teachers need to be knowledgeable about all nine strategies discussed in this book. Though not included in the nine instructional strategies, “one of the most important influences on student achievement is the relationship between the teacher and students” (p. xx). Teachers need to promote a mind-set among students that develops determination among students to improve. The first three strategies contribute to developing a growth mind-set among students.

The first edition of Classroom Instruction that Works was authored by Robert Marzano. The 2012 edition was authored by Dean, C, Hubbell, E., Pitler, H., Stone, B. The strategies discussed in this book are supported by multiple research studies. McREL researchers used meta-analysis to synthesize primary studies for each strategy and calculated the effect size for each strategy when there were sufficient quantitative data.

Effect size is a measure of the strength of a relationship or difference. It can be used to compare results among multiple studies (Muijs, 2004, p. 80-81). A positive relationship indicates that as one variable becomes stronger, then the other variable becomes stronger. One interpretation of positive effect size is (Muijs, p. 145):

\[ 0.0 < n \leq 0.1 \text{ weak} \]
\[ 0.1 < n \leq 0.3 \text{ modest} \]
\[ 0.3 < n \leq 0.5 \text{ moderate} \]
\[ 0.5 < n \leq 0.8 \text{ strong} \]
\[ 0.8 < n \leq 1.0 \text{ very strong} \]

Instructional Planning: Creating the Environment for Learning

Set objectives and provide feedback
Objectives need to be specific and communicated to students. State standards and local curriculum guides specify what students are to learn in general terms. Teachers need to analyze these documents to create more specific statements that can serve as the focus for instructional design (p. 5). The learning objective for a lesson should state what the student should know or be able to do as a result of the lesson activities.
Feedback needs to occur during the lesson and be focused on criteria. Students need to know what is correct and need to be given guidance for improvement. The effect size for providing feedback was 0.76.

**Reinforce effort and provide recognition**

The belief that all students can learn needs to be communicated to students. When teachers acknowledge students’ efforts and connect effort to achievement, then students will develop a sense of control over their learning. Providing recognition is acknowledging that the student has achieved a specific goal. The praise needs to acknowledge mastery of a specific task. This strategy is supported by descriptive research rather than meta-analysis.

**Implement cooperative learning**

Cooperative learning has a variety of definitions. Johnson and Johnson (1999, cited in Hubbell, Pitler, and Stone) “use five elements to define cooperative learning: positive interdependence, face-to-face promotive interaction, individual and group accountability, interpersonal and small-group skills, and group processing” (p. 36). Effective group learning seems to depend upon positive interdependence and individual accountability. For positive interdependence the teacher needs to ascertain that the work load is equitable among the group members. For individual accountability the teacher needs to provide feedback on each student’s contribution to the group. The group size for cooperative learning should be no more than five students (p. 41), The effect size for cooperative learning was 0.44.

**Instructional Planning: Helping Students Develop Understanding**

**Provide cues, questions, and advance organizers**

Cues, questions, and advance organizers at the beginning of a lesson focus the students learning on what is important in the lesson. Explicit cues and inferential questions are usually the most helpful to students. Expository advance organizers provide the students with a framework for the lesson. Narrative advance organizers engage students’ interest in the topic by using a story, interactive media, or a video clip. Skimming the material for a lesson provides students with a conceptual framework of the day’s lesson. Graphic advance organizers are given at the beginning of the lesson to communicate what students are expected to learn. The effect size for cues and questions is 0.20 and the effect size for advance organizers is 0.74.

**Provide nonlinguistic representations**

Information is stored in memory as words (linguistic) or images (nonlinguistic) (p.63). Graphic organizers combine words with symbols and shapes to represent relationships. Physical models and manipulatives provide students with a hands-on experience. Students can create symbolic pictures to represent the knowledge being learned. Students are involved with a kinesthetic experience if they lay down on their classroom floor to measure the length of the classroom with the non standard unit of the number of children it would take to measure the length of the classroom. The effect size for this strategy was 0.49.

**Summarize and take notes**

This strategy provides students with the opportunity to organize and reflect on important facts, concepts, ideas, and processes. These strategies involve higher-order thinking skills. Students need to be taught how to evaluate what information is important for the summary and what information may be omitted. No single form of note-taking seems to be better than another. However, note-taking is not intuitive to students and needs to be explicitly taught. Structured note-taking is more effective than unstructured. The effect size for note-taking is 0.90 and for summarizing is 0.32.
Assign homework and practice
Homework refers to “opportunities for students to learn or review content and skills outside of the regular school day” (p.101). Practice refers to “the act of repeating a specific skill or reviewing small amounts of information to increase recall, speed, and accuracy” (p. 101). Homework requiring reviewing material for an assessment seems to be more effective at improving achievement than homework assignments to review notes. The recommendation for homework is 10 minutes times the grade level with no more than 90 minutes for middle school students and two hours for high school students. An additional recommendation is that parents should not be expected to act as tutors nor should students be assigned homework on skills or processes they are not yet able to perform independently. The effect size for homework was 0.13 and the effect size for practice was 0.42.

Instructional Planning: Helping Students Extend and Apply Knowledge

Identify similarities and differences
There are four strategies for identifying similarities and differences: comparing, classifying, creating metaphors, and creating analogies. These strategies work best when embedded in an instructional sequence that includes activating prior knowledge, introducing new knowledge, identifying similarities and differences, and applying their understanding. For this strategy to be effective, teachers need to direct students to important features of the targeted knowledge. The average effect size for this strategy was 0.66.

Generate and test hypotheses
Hypothesizing is about asking “what if” questions. Subjects other than science may call this predicting, inferencing, deducing, or theorizing. Students who hypothesize are using deductive and inductive reasoning. Deductive approaches (using general rules to make a prediction) seem to be more productive than inductive approaches (drawing conclusions from specific information). There are four processes that can be used in instruction for testing hypotheses: systems analysis (analyzing the interaction of parts of a system), problem solving (identify different solutions, hypothesize the best solution, test hypothesis), experimental inquiry, and investigation. The overall effect size for this strategy was 0.25

Using the Nine Strategies
The available research seems to indicate that some of these strategies are more strongly linked to increasing student achievement than others. Teachers may want to reflect upon how often they are using each of these strategies for improving student achievement. Teachers may also want to reflect upon how often they are using the strategies that have a higher effect size. An orchestra conductor needs to know the characteristic of each instrument. The classroom teacher needs to know the characteristics of each of these strategies and choose the one most appropriate to the learning of the diverse students in the classroom and the content to be learned.