

**Coventry Public Schools  
Best Pedagogical Approaches**

**A. Effective Teaching Strategies Based on Marzano’s meta-analysis of 35 years of educational research\***

Category of Instructional Strategies	Definition
<p><b>Identifying Similarities and Differences</b></p> <p>Average Effects Size: 1.61</p> <p>Percentile Gain: 45</p>	<p>The ability to break a concept into its similar and dissimilar characteristics allows students to understand complex problems by analyzing them in a more simple way or by comparing new knowledge to prior knowledge.</p>
<p><b>Summarizing and Note-Taking</b></p> <p>Average Effects Size: 1.0</p> <p>Percentile Gain: 34</p>	<p>Summarizing and note-taking skills promote greater comprehension by asking students to analyze a subject to expose what’s essential and then put it in their own words. This requires substituting, deleting, keeping ideas, and having an awareness of the basic structure of the information presented. 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 to review notes.</p>
<p><b>Reinforcing Effort and Providing Recognition</b></p> <p>Average Effects Size: 0.80</p> <p>Percentile Gain: 29</p>	<p>Effort and recognition speak to the attitudes and beliefs of students, and teachers must show the connection between effort and achievement. Research shows students can learn to change their beliefs to emphasize effort even though not all students realize the importance of 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.</p>
<p><b>Homework and Practice</b></p> <p>Average Effects Size: 0.77</p> <p>Percentile Gain: 28</p>	<p>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 parental involvement should be minimal. Teachers explain the purpose of homework to both the student and the parent/guardian, and teachers need to give feedback on all homework assigned. Research shows that students should adapt skills while they are learning them. Speed and accuracy are key indicators of the effectiveness of practice.</p>
<p><b>Nonlinguistic Representations</b></p> <p>Average Effects Size: 0.75</p>	<p>Research shows knowledge is stored in two forms: linguistic and nonlinguistic (representing knowledge in a form other than words – visually, kinesthetically, smells, tastes, etc.). The more students use both forms in the classroom, the more opportunity they have to achieve. Recently, use of nonlinguistic representations has proven to not only stimulate but also increase brain activity.</p>

\* Source: Classroom Walkthrough with Reflective Practice: A Process for Outcomes-Based Instructional Improvement, Teachscape, 2007

\*\* Source: Visible Learning: A Synthesis of Over 800 Meta-Analyses Relating to Achievement, Hattie, 2009

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Percentile Gain: 27	
<b>Cooperative Learning</b>  Average Effects Size: 0.73  Percentile Gain: 27	Research shows that organizing students into cooperative groups yields a positive effect on overall learning. When applying cooperative learning strategies, keep groups small and do not overuse this strategy; be systematic and consistent in your approach.
<b>Setting Objectives and Providing Feedback</b>  Average Effects Size: 0.61  Percentile Gain: 23	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 should manage the form that feedback takes.
<b>Generating and Testing Hypotheses</b>  Average Effects Size: 0.61  Percentile Gain: 23	Research shows that a deductive approach (using a general rule to make a prediction) for this strategy works best. Whether a hypothesis is induced or deducted, students should clearly explain their hypotheses and conclusions.
<b>Cues, Questions, and Advance Organizers</b>  Average Effects Size: 0.59  Percentile Gain: 22	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.

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**B. Doug Reeves**

Category of Instructional Strategies	Definition
<p><b>Non-fiction Writing/Writing to Learn</b></p> <p>Average Effect Size Grade 3 Correlation Math: .88</p> <p>Average Effect Size Grade 5 Correlation Math: .77</p> <p>Average Effect Size Grade 8 Correlation Math: .83</p>	<p>The impact of nonfiction writing on student achievement is manifested not only in language arts but also in math, science, and social studies....When students write, they are engaged in thinking, reasoning, and analysis.” Reeves, Learning Leader Writing to learn involves using writing as a tool for thinking. It is a way of empowering students to work the writing process to construct meaning, understand complicated arguments, connect the dots in their knowledge, and develop insights.</p>

**C. John Hattie Influences Related to Student Achievement, “Visible Learning” (Average Effect Size is .40)\*\***

Category of Instructional Strategies	Definition
<p><b>Self-Report Grades</b></p> <p>Average Effect Size: 1.44</p>	<p>Self-reported grades comes out at the top of all influences. Children are the most accurate when predicting how they will perform. In a video Hattie explains that if he could write his book, <u>Visible Learning for Teachers</u> again, he would rename this learning strategy “Student Expectations” to express more clearly that this strategy involves the teacher finding out what are the student’s expectations and pushing the learner to exceed these expectations. Once a student has performed at a level that is beyond, his or her own expectations, he or she gains confidence in his or her learning ability.</p> <p><i>Example for Self-Reported Grades: Before an exam, ask your class to write down what mark the student expects to achieve. Use this information to engage the student to try to perform even better.</i></p>
<p><b>Providing Formative Evaluation</b></p>	<p>According to Hattie (2012) and Black &amp; William (2001) formative evaluation refers to any activity used as an assessment of learning progress before or during the learning process itself. In contrast with formative assessment, the summative assessment evaluates what students know or have learned at the end of the teaching, after all is done.</p>

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<p>Average Effect Size: 0.9</p>	<p><i>Example for formative evaluation: Spend the same amount of time or even more on formative assessment as you spend on summative assessment. Give descriptive feedback to students: What is the goal? Where are you in relation to it? What can you do to close the gap?</i></p>
<p><b>Reciprocal Teaching</b></p> <p>Average Effect Size: 0.74</p>	<p>Reciprocal Teaching was devised as an instructional process to teach students cognitive strategies intended to lead to improved learning outcomes. The emphasis is on teachers enabling students to learn and use strategies such as summarizing, questioning, clarifying, and predicting, and these are supported through dialogue between teacher and students around text. Students take turns as teacher and lead dialogue to bring meaning to written word with assistance to learn to monitor their own learning and thinking.</p>
<p><b>Feedback</b></p> <p>Average Effect Size: 0.73</p>	<p>According to Hattie and Timperley (2007) feedback is one of the most powerful influences on learning and achievement, but this impact can be either positive or negative. They developed a model of effective feedback that identifies the particular properties and circumstances that make it work. Feedback on task, process, and self-regulation level is far more effective than on the self-level (e.g. praise which contains no learning information). Descriptive feedback is closely related to providing formative assessment. In an interview Hattie emphasized that the most powerful feedback is that given from the student to the teacher. This feedback allows teachers to see learning through the eyes of their students. It makes learning visible and facilitates the planning of next steps. The feedback that students receive from their teachers is also vital. It enables students to progress towards challenging learning intentions and goals.</p> <p><i>Examples: Related to the notion of “feed up, feed back, and feed forward” teachers must answer three feedback questions: “Where am I going? How am I going? Where to next?” Constantly ask the students in order to maximize the feedback from the learner back to the teacher. Create a classroom climate where error is welcomed.</i></p>
<p><b>Spaced vs. Mass Practice</b></p> <p>Average Effect Size: 0.71</p>	<p>Provide frequency of different learning opportunities; three to four exposures to learning over several days is needed before learning occurs. Space the practice of skills over a long period of time.</p> <ul style="list-style-type: none"> <li>• Frequency of opportunities to respond is critical vs. spending more time on a task in one sitting.</li> <li>• Students need deliberate practice in order to become fluent.</li> <li>• Students often need exposure to learning over several days before they will learn new content.</li> <li>• Both acquisition and retention are improved when practice is spaced.</li> </ul>
<p><b>Metacognitive Strategies</b></p> <p>Average Effect Size: 0.71</p>	<p>Metacognitive strategies refer to those “thinking about thinking” strategies: planning how to approach a learning task, evaluating progress, and monitoring comprehension. Self-questioning is another metacognitive strategy. Involve students in applying a strategy to solve a problem and selecting and monitoring the strategy. The more varied strategies throughout a lesson, the more students are influenced.</p>
<p><b>Vocabulary Program</b></p>	<p>Students who experience vocabulary instruction experience major improvements in reading comprehension and overall reading skills. Most effective vocabulary instruction includes providing both definitional and contextual information, involving students in deeper processing and giving students more than one or two exposures to the word to be learned.</p>

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Average Effect Size: 0.67	
<b>Self- Verbalization/Self- Questioning</b>	<ul style="list-style-type: none"> <li>• Likely more useful for those students with lower to middle ability.</li> <li>• Provides assistance in searching for information, resulting in increased comprehension.</li> <li>• Effects highest for pre-lesson questioning and post-lesson questioning.</li> </ul>
Average Effect Size: 0.64	

**D. Other Strategies to Consider**

- Use of essential question and big ideas in instruction.
- Involvement of students in creating multiple representations of concepts-models, arrays, etc.
- Use of math journals for writing to learn, formative assessment, self-reporting grades, vocabulary practice, and use of metacognitive strategies.
- Teacher or student creation of word walls for direct vocabulary instruction.

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