MATRIX OF RESEARCHED INSTRUCTIONAL PRACTICES FOR SCIENCE

Source:

Schroeder, C.M., Scott, T.P., Tolson, H., Huang, T., Lee, Y. (2007). A meta-analysis of national research: Effects of teaching strategies on student achievement in science in the United States. *Journal of Research in Science Teaching.* 44(1), pp. 1436-1460.

Also known as "The TAMU Study"

Ranking	Practice	Effect Size*	# Studies
1	**Enhanced Context Strategies** Teachers relate to students' previous experiences or knowledge or engage students' interest through relating to the students'/schools' environments or settings (e.g., using problem-based learning, taking field trips, using the schoolyard for lessons, encouraging reflection)	**1.48**	*6*
2	**Collaborative Grouping Strategies** Teachers arrange students in flexible groups to work on various tasks (e.g., conducting lab exercises, inquiry projects, discussions)	**0.96**	*3*
3	**Questioning Strategies** Teachers vary timing, positioning, or cognitive levels of questions (e.g., increasing wait time, adding pauses at key student response points, including more high-cognitive-level questions, posing comprehension questions to students at the start of a lesson or assignment)	**0.74**	*3*
4	**Inquiry Strategies** Teachers use student-centered instruction that is less step-by-step and teacher-directed than traditional instruction; students answer scientific research questions by analyzing data (e.g., using guided or facilitated inquiry activities, laboratory inquiries)	**0.65**	*12*
5	**Manipulation Strategies** Teachers provide students opportunities to work or practice with physical objects (e.g., developing skills using manipulatives or apparatus, drawing or constructing something)	**0.57**	*8*
6	**Assessment Strategies** Teachers change the frequency, purpose, or cognitive levels of testing/evaluation (e.g., providing immediate or explanatory feedback, using diagnostic testing, formative testing, retesting, testing for mastery)	**0.51**	*2*
7	**Instructional Technology Strategies** Teachers use technology to enhance instruction (e.g., using computers, etc., for simulations; modeling abstract concepts and collecting data; showing videos to emphasize a concept; using pictures, photographs, or diagrams)	**0.48**	*15*
8	**Enhanced Materials Strategies** Teachers modify instructional materials (e.g., rewriting or annotating text materials, tape recording directions, simplifying laboratory apparatus)	**0.29**	*12*

*Generally, effect size greater than 0.8 is "strong", 0.5 to 0.8 is "moderate", and less than 0.5 is "weak".