Supporting Research and Bibliography

"Greater attention must be paid in American schools to higher-order thinking skills if we are to produce a citizenry able to meet our future needs. "Hands-on" activities are an excellent way to improve process skills. Students have the opportunity to see how things work, think about relationships, plan investigations, and learn from their successes and failures…Additionally, teachers, administrators, and parents must devote the necessary energy and resources to help students achieve these new goals. This will not be easy and will require dedication by all concerned" (Learning by Doing, 1987)

"In over twenty courses … the same eight characteristics emerge as major contributors to student motivation:
- Instructor's enthusiasm
- Relevance of the material
- Organization of the course
- Appropriate difficulty level of the material
- Active involvement of students
- Variety
- Rapport between teacher and students
- Use of appropriate, concrete, and understandable examples" (Sass, 1989)

"…there is no single magical formula for motivating students. Many factors affect a given student's motivation to work and to learn (Bligh, 1971; Sass, 1989)

"…students are more attentive, display better comprehension, produce more work, and are more favorable to the teaching method when they work cooperatively in groups rather than compete as individuals." (Bligh, 1971)

"Emphasize mastery and learning rather than grades" (Ames and Ames, 1990)

"Results from the Second International Science Study show that our nation's students lag behind students in other countries in laboratory and inquiry skills." (Jacobsen, 1987)

"A common belief among effective teachers … is that it is up to them to provide a multitude of tactics to reach students. In essence effective teachers view themselves as responsible for the success of their students. The effective teacher truly believes that all students can learn." (Stronge, 2002)

"Teachers tend to teach in the manner that they themselves learn best; however, effective teachers stretch beyond that comfort zone to incorporate different learning styles." (Stronge, 2002)

"Effective communication in teaching requires teachers to clearly understand the subject matter and how to share that subject matter with students in a way that they come to own it and understand it deeply." (Stronge, 2002)

 "Differentiation of Instruction. High performing teachers emphasize critical thinking skills, individualized instruction to meet specific needs, and employment of appropriate teaching strategies and techniques for differing student populations. In this case study, teachers who use hands-on activities increased NAEP scores in science and math." (Shellard & Protheroe, 2000)

"Interactive Teaching Style. Teachers who were interactive rather than didactic and spent a minimum of time reviewing past information have higher achieving students. High-quality staff development was a major factor for those teachers who utilize interactive teaching methods." (Shellard & Protheroe, 2000)

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