

# Taking a scientific approach to teaching science (and most other subjects)

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## **Abstract**

Guided by experimental tests of theory and practice, science has advanced rapidly in the past 500 years. Guided primarily by tradition and dogma, science education meanwhile has remained largely medieval. Research on how people learn is now revealing much more effective ways to teach and evaluate learning than what is in use in the traditional science class. Students and instructors find such teaching more rewarding, and it also shows students how to learn most effectively. This research is setting the stage for a new approach to teaching and learning that can provide the relevant and effective science education for all students that is needed for the 21st century. I will also cover more meaningful and effective ways to measure the quality of teaching. Although the focus of the talk is on undergraduate science and engineering teaching, where the data is the most compelling, the underlying principles come from studies of the general development of expertise and apply widely.