



The Interactive Virtual Earth Science Teaching (InVEST) project: preliminary results

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The InVEST (Interactive Virtual Earth Science Teaching) project has as its goal the development of state-of-the-art virtual reality geoscience tools that can be used to correct student misunderstandings about some geoscience phenomena. One tool, originally developed several years ago, the virtual tornadic thunderstorm, was recently modified based on feedback from instructors given the opportunity to use the tool. The modified virtual storm will be demonstrated during the presentation. In addition, a virtual volcano application is currently under development. To steer the development of this application, a Volcanic Concept Survey was recently administered to over 600 students at six U.S. institutions with the goal of identifying areas of greatest misconception relating to volcanoes. Both mean and median scores on the instrument were exceptionally low, indicating that students generally possessed minimal understanding of volcanic systems. High scores were restricted to the simplest aspects of volcanism (terminology, basic volcano shape) while questions requiring higher thinking and deeper conceptual connections (analysis of patterns, eruptive controls, and hazards) saw much lower scores. Categorical analysis of response types revealed the extent of specific misconceptions, the most predominant of which demonstrated a failure to link tectonics to a global volcanic pattern. Eruptive catalysts and controls also appear poorly understood, as are volcanic impacts on the environment and human endeavors.

The survey also included demographic information which has been analyzed. Analysis of student sources of knowledge found that over 41% of students said that they had acquired most of their understanding about volcanoes from non-traditional sources such as the popular media and Hollywood films. Application of a multiple linear regression model and an expanded model suggests that these students were much less likely to receive high scores on questions relating to understanding. In contrast, traditional sources of knowledge (in-class learning, learning from textbooks) were highly significant predictors of high score in both models.