Grand Canyon as a Universally Accessible Virtual Field Trip for Intro Geoscience Classes Using Geo-Referenced Mobile Game Technology

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THE PROBLEM
There is a well-documented and nationally reported trend of declining interest, poor preparedness, and lack of diversity within U.S. students pursuing geoscience and other STEM disciplines. We suggest that a primary contributing factor to this problem is that introductory geoscience courses simply fail to inspire (i.e., they are boring). Our experience leads us to believe that the hands-on, contextualized learning of field excursions are often the most impactful component of lower division geoscience classes. However, field trips are becoming increasingly more difficult to run due to logistics and liability, high enrollments, decreasing financial and administrative support, and exclusion of the physically disabled.

ASKING STUDENTS TO USE THEIR SMARTPHONES INSTEAD OF TELLING THEM TO PUT THEIR AWAY
Recent research suggests that virtual field trips can be used to simulate this contextualized physical learning through the use of mobile devices—technologies that exist in most students’ hands already. Our primary goal is to enhance interest in introductory geoscience courses by providing the kinetic and physical learning experience of field trips through geo-referenced educational, mobile games and test the hypothesis that these experiences can be effectively simulated through virtual field trips. We are doing this by developing “serious” games for mobile devices that deliver introductory geoscience material in a fun and interactive manner.

Our new teaching strategy will enhance undergraduate student learning in the geosciences, be accessible to students of diverse backgrounds and physical abilities, and be readily incorporated into higher education programs and curricula globally.

DISCUSSION AND FUTURE PLANS
The results of these early assessments are positive, both in regard to the improvement of students’ understanding of key concepts and their enjoyment of learning with mobile technology. This is a positive first step in developing innovative teaching that utilizes powerful tools students are already intimate with in order to make first-year STEM courses unboring, and to make world-class field trips accessible to all!