



Experiential learning in soil science: Use of an augmented reality sandbox

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It is known widely that greater learning occurs when students are active participants. Novel technologies allow instructors the opportunity to create interactive activities for undergraduate students to gain comprehension of complex landscape processes. We incorporated the use of an Augmented Reality (AR) Sandbox in the Introductory Soil Science course at the University of Wyoming to facilitate an experiential learning experience in pedology. The AR Sandbox was developed by researchers at the University of California, Davis as part of a project on informal science education in freshwater lakes and watershed science. It is a hands-on display that allows users to create topography models by shaping sand that is augmented in real-time by a colored elevation maps, topographic contour lines, and simulated water. It uses a 3-dimensional motion sensing camera that detects changes to the distance between the sand surface and the camera sensor. A short-throw projector then displays the elevation model and contour lines in real-time. Undergraduate students enrolled in the Introductory Soil Science course were tasked with creating a virtual landscape and then predicting where particular soils would form on the various landforms. All participants reported a greater comprehension of surface water flow, erosion, and soil formation as a result of this exercise. They provided suggestions for future activities using the AR Sandbox including its incorporation into lessons of watershed hydrology, land management, soil water, and soil genesis.