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Visualizing Landform Calculations Proposal

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Visualizing landform calculations

LAA 5422 Landscape Development is the only math-integrated course in our heavily design-focused landscape architecture curriculum. Majority of our students enter the program with the assumption of no math, and immediately panic when they hear about it during the first class meeting. The course introduces landform creation techniques through the generation of contour lines that are determined from slope calculations. This subject is rigorously tested after graduation, as part of each state's licensing examination, and has the lowest passing rate nationally. Recently, I created a fun assignment by utilizing the concept of "learning by doing." I was inspired by my daughter's sand play at Miami Beach. The assignment asked students to build a sand table and flow water through it in order to generate desired landforms. With the help of eroding forces of water, the students sculpted beautiful land formations. Spot elevations on 2-dimensional contour map have become visible on the 3-dimensional model, and the students were able to clearly see the elevation and the slope they were calculating. The assignment helped them to visually digest the meaning of spot elevation calculations for contour mapping and reduced the time spent on the subject matter in the classroom.

What worked:
+ Our visually oriented (heavily right-brained) students better understood math calculations with the aid of a 3d model that they built themselves. They said, "Now calculations make way more sense."
+ We all had so much fun.

What didn't work:
+ The models ended up being overly large and hard to carry around. We poured some sand and made mess inside the classroom (we cleaned it after the class).
+ Building a sand table was an additional cost (about $20-$50 per student.) A couple of students did not have the budget to cover this unexpected cost and ultimately decided to not to build the sand table. However, I was able to pair those students with participating students, so that they could still benefit from the 3d-models during calculations.

What will I do next time:
+ I will include the assignment and its cost into my course syllabus.
+ I will chose smaller dimensions for the sand table model so that it is easier to carry around, and hopefully less messy ☺
+ I will ask for the use of colored water so that the water lines on the sand piles are visible (my amazing students' recommendation.)