

**Landing Virtual Learning:
Using Zoom Annotation Tools and At-Home Supplies to Teach Land Evaluation**

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Introduction

Experiential learning is a foundational component of secondary agricultural education. The shift to virtual or hybrid learning, due to the COVID-19 pandemic in March 2020, threw a major learning curve not only to students but teachers as well. By human nature, learning and development cannot occur without some type of experience (Beard & Wilson, 2006). The experiential learning theory explains that knowledge occurs after experiences have been grasped and transformed (Kolb, 1984). Creating hands-on learning experiences is vital to thriving in a virtual learning environment. The goal of this innovative idea is to develop well-designed learning experiences in agricultural education that can be conducted through laboratories to strengthen student literacy.

To improve engagement through Zoom or other virtual learning platforms, a reinforced emphasis should be placed on experiential learning opportunities by embracing online learning communities. Building an online community is essential for a collaborative learning experience. Three elements—social presence, teaching presence, and cognitive presence—are essential to the success in an online community of inquiry (Garrison, 2017). By implementing these elements, educators are incorporating engaging and meaningful classes. As experiential learning sets the foundation of agricultural education courses, several primary learning moments occur through hands-on labs, activities, or career development events (CDEs) experiences. However, as agricultural educators adjusted to a new virtual or hybrid teaching norm, some may still struggle to teach CDEs due to their hands-on nature. For states that compete in the land evaluation CDE, students are asked to evaluate soil samples to determine the soil type based on the texture. In a face-to-face setting, teachers likely have a variety of soil samples that accurately showcase soil profiles to teach students to evaluate the appropriate texture. However, with the shift to virtual learning, distributing soil samples to all students in their homes may be challenging. By using common household pantry staples students may likely have in their homes, agricultural educators can provide hands-on, tactile instruction to teach soil textures.

Methods

To investigate this innovative idea, we piloted a soils activity via Zoom with an advanced agricultural education course designed to introduce future teachers to CDEs and leadership development events (LDEs) at New Mexico State University. Once students gathered the materials and returned to their cameras, we shared a brief, interactive Google presentation with the students to introduce key concepts regarding the land evaluation CDE. The Google slides consisted of photographs of animated and real soil profiles. After reviewing the different horizons of a soil profile, students then used the annotate tool in Zoom (Zoom, 2021) to label the correct horizons (i.e., topsoil, subsoil, and parent material) in the soil profile listed on their screen. After labeling the correct horizons, we scattered high-definition photos of each horizon across the screen. Students were then placed in groups and sent to a breakout room, where they were tasked with rearranging the photos to build a soil profile using the high-definition photos.

Finally, students were shown the Oklahoma Extension Service (2009) “Flow Diagram for Estimating Soil Texture by Feel” used in the New Mexico land evaluation CDE. We instructed students to visit their pantry or kitchen cabinets and gather the following materials: salt, sugar, coffee grounds, corn meal, flour, dried beans, and rice. Land judging recognizes five different

texture categories: course, moderately course, medium, moderately fine, and fine. Using the pantry items, students replicated course, medium, and fine soil textures by using the diagram.

Results to Date and Implications

At the end of the pilot, students acknowledged the content from the PowerPoint was designed in a way that higher-order thinking was encouraged, and each slide led into the other. Students stated that labeling the soil profiles and horizons with the annotate tool in Zoom was fun and provided a visual representation of how other students would label soil profiles. This type of peer engagement encouraged students to actively participate in the lessons. Students also enjoyed the soil replication activity. Although not all students had the pantry supplies, students improvised and worked with what they had to imitate the soil textures. Students also expressed their excitement to be using their hands to feel the differences in the texture, which students stated helped them reinforce how course, medium, and fine soil types might feel.

The soil replication activity is an engaging resource for all students and teachers who would like to teach or learn soil profiles. Agricultural educators may also use this activity to gain interest in the land evaluation CDE from younger members who are gaining exposure to CDE contests and would like to participate in a contest. The activity would be best suited to use as an introduction lesson to teach students about soils in agricultural classes.

Future Plans and Advice to Others

Based on the feedback we received from piloting this activity, teaching land evaluation through a virtual learning platform is feasible and can encourage hands-on, experiential learning. Future plans for this activity would be to identify other pantry staples that could be used to replicate the other two texture categories (i.e., moderately course and moderately fine) or mix the pantry staples (i.e., flour and salt) to get the correct ratio needed. Also, once students have a good understanding of the soil textures using the pantry staples, we encourage teachers to instruct their students to go outside and collect soil samples from various locations around their homes to have students label soil types based on their interpretation of the texture of the soil to reinforce the experiential learning cycle. Along with having students gather soil samples, teachers should provide reflection questions for students to answer after exploring textures with the pantry staples and then again after they have explored real soil samples.

Our advice for future teachers is to practice using the annotate tool in Zoom prior to launching with a class. When using the annotate tool in Zoom, educators should ensure their settings allow all participants to use the feature when they are hosting a meeting. We recommend instructors share the lecture slides and reflection questions with students via a shared platform or learning management system, such as Google Classroom, Canvas, etc., in case students face connectivity issues. Students may also not have all of the pantry staples prior to the lesson, so instructors should provide an announcement to the class or parents before implementing the activity so students can be prepared with the necessary supplies.

Cost and Resources

The soil replication activity has minimal cost as most of the materials are common household items likely found in a student's home. However, if they do not have the pantry staples, teachers and students can purchase the needed items (salt, sugar, coffee grounds, corn meal, flour, dried beans, and rice) for approximately \$20.

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