

**Using a Strawberry DNA Challenge to Explore the Needs of Students with Disabilities**

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## Introduction/Need for the Idea

Approximately 7.2 million students from the ages of three to 21 years old received special education services in 2020-2021 (NCES, 2022). With that being said, 90% of preservice general education teachers who have completed or are about to complete their teacher preparation program say they are “less than adequately prepared to instruct the student(s) with specific disabilities” (Rosenzweig, 2009, pg 17). Giffing, et al. (2010) found that majority of agriculture teachers have the willingness to include students with disabilities in their classrooms but did not perceive that they have the ability and skills to do so. Previous research in agricultural education has described the benefits that agricultural education has for students with disabilities. In particular, concrete, hands-on learning activities are beneficial for students with disabilities because it helps them to develop life skills (Domody, et al., 2006). According to Shapiro and Lentz (1991) students who have had training in specific career and technical education coursework, on average had better employment outcomes upon entering the workforce, even if their career was not involved in the career they studies. This uniquely positions agricultural education to provide essential skill training to all students, including those with disabilities, by providing high-quality hands-on training which will benefit them in their future careers. However, in order to include students effectively, teachers must develop the skills needed to work with all learners when teaching hands-on skills.

## How It Works

This activity is part of a larger workshop that has been conducted in a variety of formats including the National Association of Agricultural Educators (NAAE) professional development sessions, NAAE Future Agriscience Teacher Symposium workshops, National FFA Convention professional development sessions and at Louisiana State University through a course titled *Engaging Diverse Learners in Agricultural and Extension Education*. The purpose of this activity is for participants to better understand the difficulties that come from trying to complete an activity while experiencing a significant challenge. Participants participate in a DNA extraction activity while blindfolded and then reflect on how the activity could have be simplified or clarified to help them complete the activity more easily. It is important to note, that being blindfolded does provide the same experience that a student might have who is blind, and it is stressed to participants that the purpose of the activity is not to experience the world like a person who is blind, but instead to focus on teaching methods and strategies that would have benefitted the entire laboratory, even with the challenges provided.

For this activity, participants are put into pairs and given minimal instructions. No demonstrations or review of the directions is included. Instead, participants are instructed to read and figure out the lab activity on their own. One of the individuals in each pair is blindfolded. The other individual must read the instructions and give guidance for their partner to complete the final instructions of the activity. The individual who is blindfolded should complete all steps of the activity including moving around the classroom to gather materials. Roughly two-thirds of the way through the lab, as the pair is waiting for the filtration process to finish, they switch who is blindfolded. Then, the previously blindfolded individual must guide their partner through finishing the lab exercise. Once the pair has completed the lab, they remove the blindfold and reflect on the activity together. After each pair has reflected, the larger group is led in a discussion to identify teaching strategies which could have benefitted everyone completing the

lab. Participants often identify strategies such as the teacher conducting a demonstration before they begin the lab activity, increased clarity, organization of the room and materials, and less distractions as some of the most common ways the lab could be improved. It is stressed that these activities would benefit all learners but could be especially helpful for helping students with disabilities complete lab activities successfully.

### **Results to Date**

This workshop has received excellent evaluations when data were collected (average of a 4.7 on a 5-point scale). Most recently, this activity was conducted with a group of 14 students at Louisiana State University in the Engaging Diverse Learners in Agricultural and Extension Education course. After completion, students were asked to reflect on their experience and the impact of it, the students reported a positive change in thinking about students with disabilities. Selected comments include:

- “I think this activity was eye opening to show us how small things can change accessibility.”
- “It will make me take the extra time to make sure that they do understand what I am trying to tell them.”
- “It changed my way of thinking when working with people with disabilities because while vision was my disability in this lab others have different disabilities that I may never be able to relate to.”
- “We often do not notice or realize the little things in the classroom or a learning environment that people with disabilities may have trouble with it. I feel that this activity was the perfect way to help me realize what I need to do as an educator.”

### **Future Plans/Advice to Others**

This learning activity will continue to be a part of coursework at Louisiana State University, and it will also continue to be offered in workshop format for organizations when requested. When replicating this workshop, any hands-on activity is effective, but care should be taken to select activities that will be safe for participants to conduct while blindfolded. Safety precautions must also be taken when participants are moving around the room to gather materials. It is also important to stress to participants that this is not a simulation activity and that being blindfolded does not replicate the experiences of someone who is blind. Instead, missing one of their major senses allows the participants to identify beneficial teaching strategies by exploring how teaching methods and strategies can improve the learning experience for all students.

### **Cost/Resources Needed**

The overall cost of this lab is minimal. This lab is designed to use materials found in a traditional agricultural education classroom and grocery store. This lab can be easily replicated by the students in a formal and nonformal agricultural education setting with a low budget. This experience cost approximately \$65. This cost is including all lab materials, such as plastic graduated cylinders and bandanas, that can be reused year after year and for various other labs. The perishable and reoccurring cost would include cups, strawberries, dish soap, salt, zip-lock bags, wooden stirring rods and isopropyl alcohol. The cost of these items is approximately \$20.

## References

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