

PROBLEM-SOLVING SKILLS IN AGRICULTURE EDUCATION

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RATIONALE

Joining FFA in high school while taking agricultural education classes introduced the idea of pursuing a future career in agriculture to me. Through work experiences, college, and student teaching I have continuously learned about the different careers the agriculture industry provides, and it is a goal of mine to share these with students. Agricultural education provides students with opportunities for preparation for future learning (Kohn, 2019). Overall, my goal is to prepare students to become positive, productive members of society post-high school.

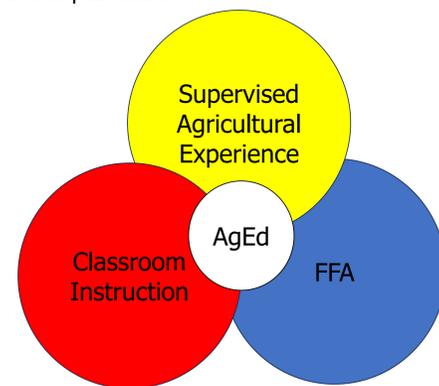
The following areas support my work as an agricultural education teacher to teach problem-solving skills to prepare students' post-high school:

- FFA
- Supervised Agricultural Experiences (SAE projects)
- Hands-on experiential learning in the classroom

3 CIRCLE MODEL IN AGRICULTURE EDUCATION

Agricultural education falls under Career and Technical Education (CTE) that involves courses such as animal sciences, plant sciences, metal fabrication, agriculture power and technology, agribusiness, etc. Agricultural education follows a 3-circle model which includes FFA, SAE (Supervised Agricultural Experience) projects, and hands-on in class experiential learning. For students to obtain the full agricultural education experience, they will participate in each area of the 3-circle model, providing students with leadership and career development skills. Of these professional growth soft-skills that agricultural education provides students is problem-solving.

- FFA provides students with the opportunity to be involved in an organization to learn how to be leaders and develop career skills in agriculture. FFA is committed to teaching students modern and traditional ways of problem-solving skills in agriculture ("10 ways FFA is growing tomorrow's ag leaders," 2022).
- SAE projects provide students an opportunity to learn and improve their problem-solving skills by completing any sort of project related to agriculture. Students can physically work in the agriculture industry, choose an entrepreneurship/ownership project, or do a research project that is related to agriculture ("The SAE for all Program"). Students will be able to choose a project that interests them most, learn more about the topic, and improve their problem-solving skills personally.
- Hands-on experiential learning is a huge portion of agricultural education, especially for those students that choose to not participate in FFA. Students will be engaged in laboratory settings through dissections, working in school barns or greenhouses, and working in the shop. Experiential learning in the classroom prepares students with problem-solving skills for post-high school pursuits.



FFA motto: *Learning to Do, Doing to Learn, Earning to Live, Living to serve.*



SAE projects for students showing pigs at the Palouse Empire Fair as FFA members.



A students' metal shop project where they made a shrimp out of sheet metal.

RESEARCH

Students are having a hard time with obtaining problem-solving skills, and this struggle is following student's post-high school. Students memorize information just fine, but there is a misconnection between putting the information and equations into applicable situations where students use prior knowledge to problem-solve. High school students were observed to see what cognitive skills of problem-solving they struggle with most. The following five highlighted areas are where they struggle most:

- Defining the problem
- Searching for information
- Scanning information
- Processing information
- Organizing and presenting information

Agricultural education provides various opportunities for students to learn problem-solving skills in applicable situations. To find the best way to effectively teach students how to problem solve, a study was conducted in agriculture education classrooms to see the difference between using the subject matter approach in the classroom (teacher led) versus the problem-solving approach (student led) (Dryer, et. al., 1996). Through the problem-solving approach, students are given real-world problems and situations to critically think about, work together, and eventually solve. It was concluded the problem-solving approach was more effective than the subject matter approach, increasing the problem-solving strategies in these students (Dryer, et. al., 1996). Additionally, the problem-solving approach created a learning style that benefited a more diverse group of students due to the solutions being open ended rather than right or wrong (Dryer, et. al., 1996).

Problem based learning in the classroom involves presenting real-world problems to students where they must use different strategies to analyze and logically think through the problem to solve it. Real-world problems with open-ended answers allow for students to think through the problem, rather than be concerned about the right or wrong answer. The first step in teaching problem-solving skills is to teach students that problem solving requires more than finding the correct answer (Lin, et. al., 2012). Presenting real-world problems to students allows them to apply their knowledge, logic, and analysis in class to solving a real-life situation.

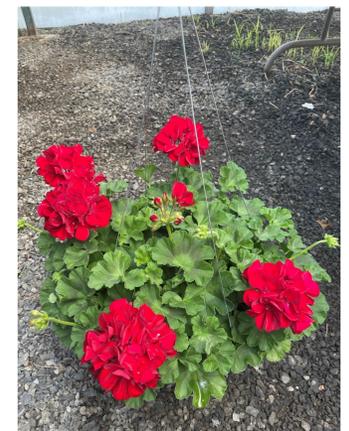
ACTION

As an agricultural educator, I will implement the 3-circle model of agriculture education in my classroom. I will encourage students to join FFA, complete SAE projects, and participate in hands-on experiential learning in the classroom. Students will gain problem-solving skills in my classroom through the following educational techniques:

- Teaching relevant information that connects back to students' lives
- Using the problem-solving learning approach; putting students in the driver's seat of their learning
- Teaching how to decode text
- Providing real-world problem scenarios in class
- A laboratory setting for students to complete experiments will allow students to come to their own conclusions
- Providing projects that will be both completed on students' own or in groups
- Through FFA students will learn to apply their knowledge to find different solutions to problems in agriculture through leadership and career development events
- Through SAE projects students will choose an area of agriculture that interests them putting them in the driver's seat of their learning through gaining problem-solving skills while learning more about the agriculture industry



In class dissection of a female pig reproduction tract. Students had the opportunity to remove fetal pigs from the uterus.



In the greenhouse, students got to learn greenhouse management, plant care, and how to make hanging baskets for the plant sale fundraiser for FFA.



In class fetal pig dissection. Learning the different internal organs and functions.

INQUIRY QUESTIONS

- How can the 3-circle model (FFA, hands-on experiential learning, and SAE projects) build problem solving skills in students?
- What are some different instructional methods that I can implement in the classroom to improve students' problem-solving skills?

WHAT ARE PROBLEM-SOLVING SKILLS?

Problem-solving skills means students are finding a solution to questions that they do not automatically know the answer to (Incebacak, et. al., 2016). To be considered college and career-ready, students must be considered competent in critical thinking, communication, and the ability to problem solve in a group setting (Copeland, et. al., 2020).

TPEP Alignment: Criterion 4 Providing clear and intentional focus on subject matter content and curriculum.

Descriptor: Content knowledge; the teacher uses content area knowledge, learning standards, appropriate pedagogy and resources to design and deliver curricula and instruction to impact student learning.

