CASE

ARD Unit Review – Week 2

Unit 2 Problems and Solutions

Lessons and topics within the unit:	Lesson 2.1 Defining the Problem Lesson 2.2 Proposing Solutions

Notes from Webinar

Topic: **"Making Connections"** Date: 9/17/18

Guest Teacher:

Notes, questions, and ideas:

Week 1 Unit Review Tool review

Address online learning issues

Review weekly schedule, expectations, deadlines

"Circling" nature of R&D processes

Refer to the table below for a list of APP for this week. Please note modifications and expectations.

APP	CI Modifications and Expectations	Action
2.1.1 Living in a Global Society	Determine topics related to pathway with partner in lab notebook	In lab notebook **DISCUSSION POST** ✓
Reading: Ch. 1, *Research Methods for Science*	Discussion questions in Unit Review Tool - review during synchronous meeting	In Unit Review Tool
2.1.2 Brainstorming	Brainstorm	In lab notebook
2.1.3 Recognizing Constraints	Constraints list	In lab notebook
2.1.4 The Problem Statement	Problem statement written	(save for later APP)
2.2.1 Overcoming Obstacles	Obstacles	In Unit Review Tool
2.2.2 A Flurry of Solutions	Decision matrix	In Unit Review Tool
2.2.3 Feasibility Studies	Feasibility study	(save for later APP)
2.2.4 Solution Proposals	Solution proposal	CASE Online Week 2 Dropbox
2.2.5 Casting a Net for Information	Professional network for student use	**DISCUSSION POST**
Unit Review Tool	N/A	CASE Online Week 2 Dropbox
Weekly Reflection	N/A	Complete on CASE Online
Watch for the email reminder for the next **Zoom Meeting** and weekly **Unit Review Tool**.		

Problem 2.1.1 Discussion

DISCUSSION POST IN CASE ONLINE:

Complete *Problem 2.1.1 Living in a Global Society*. Share the 3-5 topics you identified from your pathway, as well as your chosen topic to focus on throughout the research project. Share your research and reasoning. Keep in mind that as you complete the lesson, your chosen topic may change or need refinement, and you may circle back to APPs within the lesson. This is normal and even expected within a true R&D process.

Chapter 1 Reading Questions

Student Discussion Questions:

- How are testable and closed questions used in research?

Testable questions are used to formulate and test a hypothesis. The hypothesis may proven or disproven or inconclusive. Closed questions can be answered with a yes or no.

- When is it most appropriate to use hypothesis driven research?

Hypothesis driven research is most appropriate when the desired results are testable.

- How do the processes differ for experimental research and applied research?

Experimental research involves the researcher conducting an actual test. Applied research is used to solve a specific, practicle problem.

- What types of research have you conducted in the past?

I have conducted both experimental and applied research, however, I enjoy experimental research the most.

Facilitation Question How could you use the book and facilitate reading assignments in your classroom?

I would use the book as a whole class discussion to facilitate thinking of how we may use types of research in student-driven projects.

Activity 2.2.1 Checksheet

Criteria	Comments	Target Date	Date Completed
Social considerations: • How could solving your problem impact a society in terms of food security, family structure, or culture? • What societal obstacles may hinder the development and/or adoption of the problem? • What is the purpose of the research? • What will you do with the research?	Solving the problem of sharing produce to the community could help alleviate some food insecurity. Obstacles could include not knowing demand and/or our growing capacity. The purpose of the research would be used to increase our growing capacity and the grain method would be implemented.		
Legal considerations: • How could your problem impact policy and government (local, state, national, international)? • What legal obstacles exist for the development and/or adoption of the problem? • Is it a replication or extension of previous research? Do you have permissions?	This problem of food insecurity impacts our local community, both school-aged & older. The main obstacle will be determining who is eligible to receive free produce. This research is new to our community.		
Financial considerations: • How could the solution to your problem impact families, communities, and/or commercial businesses financially? • What financial obstacles exist for the development and/or adoption of the problem?	Coming up with what produce could be grown at the greatest rate would impact commodity. Financial obstacles that ~~are~~ exist are purchasing enough equipment to continue growing the preferred method.		
Environmental considerations: • How could the problem impact the environment (local, state, national, international)? • What environmental factors might affect the development and/or adoption of the problem?	Once we are successful in this endeavor hopefully our Chapter will serve as a model to other Chapters. Environmental factors could be acceptance of free food.		
Other:	I have received a grant to purchase some hydroponics equipment and would like to test the idea for this course.		

Activity 2.2.2 Worksheet

Table 1. *Decision Matrix*

Problem	Yield between hydroponics and media Food insecurity						
	Criteria						**Option Score**
Solution	1. Cost **Weight:** 4	2. Productivity **Weight:** 3	3. Results **Weight:** 1	4. Application **Weight:** 2	5. Weather (growing season) **Weight:** 3	6. Maint. **Weight:** 2	
1. Hydro	4 x 4 = 16 rank x weight = pts	To be tested ___ x ___ = ___ rank x weight = pts	to be tested ___ x ___ = ___ rank x weight = pts	to be tested ___ x ___ = ___ rank x weight = pts	4 x 3 = 12 rank x weight = pts	to be tested ___ x ___ = ___ rank x weight = pts	
2. Media	2 x 4 = 8 rank x weight = pts	2 x 3 = 6 rank x weight = pts	4 x 1 = 4 rank x weight = pts	2 x 2 = 4 rank x weight = pts	4 x 3 = 12 rank x weight = pts	4 x 2 = 8 rank x weight = pts	42
3. Field Grown	1 x 4 = 4 rank x weight = pts	1 x 3 = 3 rank x weight = pts	4 x 1 = 4 rank x weight = pts	1 x 2 = 2 rank x weight = pts	1 x 3 = 3 rank x weight = pts	1 x 2 = 2 rank x weight = pts	13
4. Raised Bed	3 x 4 = 12 rank x weight = pts	3 x 3 = 9 rank x weight = pts	4 x 1 = 4 rank x weight = pts	3 x 2 = 6 rank x weight = pts	2 x 3 = 6 rank x weight = pts	2 x 2 = 4 rank x weight = pts	41
5.	___ x ___ = ___ rank x weight = pts	___ x ___ = ___ rank x weight = pts	___ x ___ = ___ rank x weight = pts	___ x ___ = ___ rank x weight = pts	___ x ___ = ___ rank x weight = pts	___ x ___ = ___ rank x weight = pts	

Project 2.2.3 Checksheet

Criteria	Comments	Target Date	Date Completed
Project Description • Type and quality of product/service that you hope will result from your research. • What is the goal of the project? • What is the potential economic/social impact on the area or region that you are focusing on? • What is the potential environmental impact of the project?	I hope to gain an understanding of where to put grant money to use. The goal is to determine the best method to grow produce to help alleviate a little food insecurity. • With Beach Grove City Limits • Access to fresh produce for all		
Market Feasibility • What is the current or projected demand for your proposed product/service? • What are the target market(s) for this product/service? • What is the projected supply for your product/service? • What competition exists in the current market?	• Food insecurity high – demand for produce TBD • BG community members • Funded grants than hopefully self-sustained • A local competitor would be farmers markets		
Technical Feasibility • What are the technology needs for your product/service and research? • What other equipment do you need for your product/service? • Where will you obtain the technology and equipment necessary? • How does your ability to obtain the technology and equipment affect your start-up timeline?	• Data driven results – trials • Hydroponic system • Through a funded grant (in the works) • It should not be an issue It will be much smaller scale, but good for data		
Organizational/Managerial Feasibility • Who are the members of your research group? • What role(s) will each group member play? • Who are your external network members/partners? • What will each partner bring to the project?	• Myself & Kim Barkman • Equally divided • Retired Dow Elanco professional • I will bring Plant background, Kim brings vision for market		
Financial/Economic Feasibility • What are the start-up costs? What are the costs of items needed in order to conduct your research? • What are some sources of financing? Are there grants available to help finance your research?	• Approximately $10000K, we have current seed stock to use • Grants → yes		
Study Conclusions • What alternatives exist to the project that you have selected? • What are other ways to reach the goal(s) outlined in the Project Description section? • How will decisions be made?	• Just looking at 'others work' on data • Plenty of research • By our data, time, feasibility		
Peer Review of the Feasibility Study • Feedback • Recommendations • Edit and adjustments are made accordingly	• Still in the works • Reliance on our school nutritionist, public feedback		
Teacher Review of the Feasibility Study • Feedback • Recommendations • Edit and adjustments are made accordingly	• From administrators, staff throughout our corporation		

Project 2.2.4 Checksheet

Criteria	Comments	Target Date	Date Completed
Problem Statement • Use statement drafted in *Project 2.1.4 The Problem Statement.*	What is the best way for Beech Grove to help alleviate the impacts of food insecurity?		
Background information: • The issue and any background information that may be necessary. • Region or area affected by the issue. • Demographics of the population.	• Yes, data from our city on Federal assistance • Local Indianapolis suburb • 48,000		
Proposed Solution • Clear and concise statement of how the problem will be solved.	This problem will be solved by tracking how much assistance (free produce) is handed out.		
A list of needs for the solution: • Materials • Equipment and tools • Laboratory space • Professional answers and feedback • Expenses • Safety precautions	• Data • Hydroponics • Grow Cart • Lighting • Plant Room • Market		
Procedures • How will research and development be conducted? • Set-up • How to collect data • Number of trials proposed	• Initial Research will begin with data • Trials • In sheets, Hopefully 2-grow rotations		
Data Analysis and Expected Results • Plan to collect and analyze data • Description of expected results based on solution proposed.	• How much food is given out • #lbs grown in media vs. hydroponics		
Conclusion • The problem and proposed solutions are re-stated.	Proposed solution will be which method & how much produce distributed		
References • APA format • Use annotated references from prior research and any additional resources used.	✓ Still gathering		
Solution proposal has been reviewed by two other pairs of students.	Just by colleague so far		
Solution proposal has been adjusted according to feedback and submitted to the teacher for approval.	Always being adjusted & modified		
Solution proposal has been approved by the teacher.	Kim Barkman		

Activity 2.2.5 Discussion

DISCUSSION POST IN CASE ONLINE:

In *Project 2.2.5 Casting a Net for Information*, students are asked to develop a network of resources who can help them solve problems with their research project. How will you support students in finding appropriate people to form the resource group? What people or groups are you aware of that you can add to the lists?

Students will consider the following suggestions during the activity. Whom can you suggest for local resources for your students to contact?

- Who do you know who might be able to help you?
- Who do your classmates know who might be able to help you?
- Who do your friends know who might be able to help you? (Think about friends who might be in college, especially).
- Who does your family know who might be able to help you?
- Who does your teacher know who might be able to help you?
- Who do your fellow agriculture education students across the U.S. know who might be able to help you?
- Who do your social networking contacts know who might be able to help you?

Unit Overview

How does information in lesson prefaces prepare you for the lessons and the unit? What additional information do you need?	I see my students excelling at giving opinions on the student discussions. I need more time with book.
As you review the APP in this unit, where do you see your students excelling? How might they struggle?	Students will struggle with this units decision matrix - there are so many factors
What components of the course-long research project are developed in this unit? What resources will you need to have available to students?	Components that are developed are considerations and feasibility. Resources will need to gathering a students will need to know what is available to them.
What questions do you have related to this unit?	I have questions for myself on what opportunities I can provide for student driven research.
Timing: according to the teaching timeline, about how many days should this unit last? What challenges and conflicts do you foresee during that part of the school year?	This unit should take me approximately 20 blocks (85 min) each. Students may hit road blocks causing a delay with this schedule.