Influence of Case Studies when Teaching Agricultural and Natural Resource Issues

Jessica Harsh, Dr. Alexa Lamm, Dr. Courtney Meyers, Dr. Ricky Telg, Becky Raulerson

Why case studies?

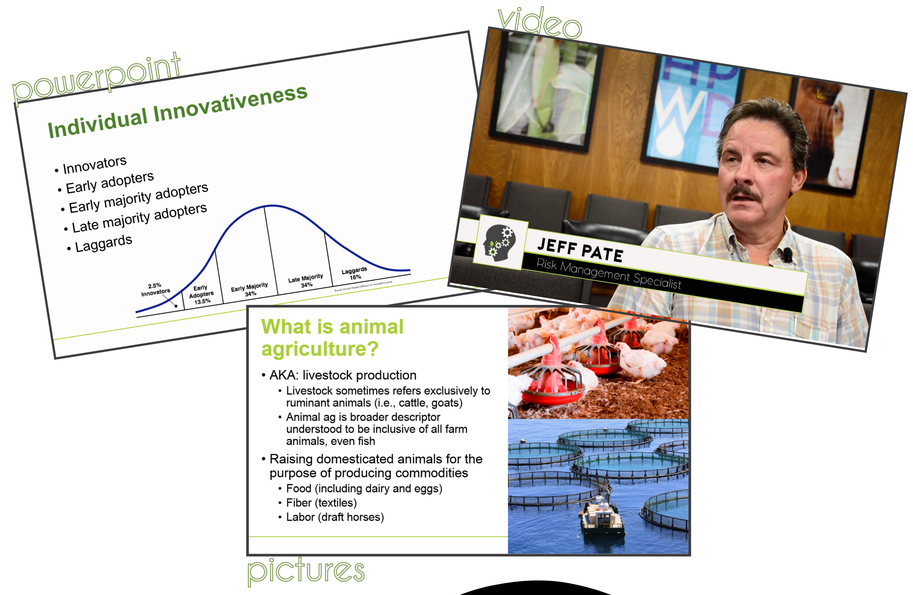
- ANR college graduates need to be aware of and knowledgeable about these issues to become leaders in the ANR industry upon graduation.
- Case studies help engage students in complex issues (Naumes & Naumes, 2006).
- Case studies are written narratives based on facts and data from a past event or experience (Naumes & Naumes, 2006).
- Videos, audio clips, web resources and animations recreate real world scenarios (Chattaraman, Sankar, & Vallone, 2010).
- Students typically retain more information when they learn by doing (Naumes & Naumes, 2006).
- Case studies can bring personal relevance to the classroom through multimedia experiences (Chattaraman et al., 2010).

Methods

- Sample: 26 students enrolled in AGCOMM 3300: Communicating Agriculture to the Public class at Texas Tech University.
- Three case studies were taught: antibiotics in animals, water conservation in agriculture, and crisis communication after a food recall.
- Pre/Post test was developed to assess perceived knowledge.
- Qualtrics was used to distribute the survey.

Conclusion & Recommendations

- Students did increase knowledge by experiencing case studies with some topics.
- Case studies should be used in agricultural education.
- Pretest effect could have impacted results.
- Future research should look at actual knowledge.
- Future research should look at actual knowledge.
- Experimental design between case study and traditional teaching.



Purpose & Objectives

Purpose:

- Assess if case studies increased undergraduate students' self-perceived knowledge of ANR issues when taking an ANR issues course.

Objectives:

- Describe undergraduate self-perceived knowledge before and after taking an ANR issues course with integrated case studies.
- Determine if there was a significant difference in perceived knowledge gain as a result.

Case studies did have a positive impact

- Two of the three topics covered by the case studies, food safety and water, had statistically significant change in self-perceived knowledge.
- Five of the nine topics were statistically significant in self-perceived knowledge.
- *Somewhat knowledgeable* increased for food security, while low and high knowledge both decreased.

Funded by USDA Higher Education Challenge Grant no. 2015-08062

TEXAS TECH UNIVERSITY College of Agricultural Sciences & Natural Resources

UF IFAS UNIVERSITY of FLORIDA

Center for Public Issues Education

UF IFAS UNIVERSITY of FLORIDA AGRICULTURAL EDUCATION AND COMMUNICATION

Communicating About Agricultural Issues with Consumers:
HOW MUCH DO LABELS MATTER?

Taylor K. Ruth, Ashley N. McLeod, Alexa J. Lamm, Joy N. Rumble, Jason D. Ellis

INTRODUCTION

Nearly half of American consumers purchase organic or non-GMO food (Riffkin, 2014).

Recent legislation will require labeling for food that contains GMOs (Sunstein, 2016).

GMO oranges might be necessary to save the citrus industry (Allen, 2016) from citrus greening, a devestating citrus disease present in all major citrus producing states.

Agricultural communicators will need to better understand consumers' purchasing intent of orange juice to best position products if GMOs are used to save the citrus industry.

PURPOSE

To determine how United States consumers' purchasing intent of orange juice related to price and label

Priority Area One of the National Research Agenda: Public and policy maker understanding of agriculture and natural resources (Roberts, Harder, & Brashears, 2016)

LITERATURE REVIEW

Theory of loss aversion states that messages framed around loss are more influential than those framed around gains (Tversky & Kahnemanm, 1981).

Theory includes the frames of non-loss and non-gain or the absence of a negative attribute (Liberman, Idson, & Higgins, 2005)

Consumers are willing to pay a premium for non-GMO labeled products compared to identical products with no additional label (Wolfe et al., 2016).

RESULTS

43.3%

GMO-free bottle for $3.49

56.7%

$2.99 bottle without additional label

Respondents indicated the following reasons for choosing the respective bottle:

GMO-FREE BOTTLE		LOWER PRICE BOTTLE	
GMO-free product	73.9%	Price	92.0%
Liked the label	20.4%	Liked the label	4.9%
Price	12.5%	Other	6.1%
Other	<5.0%	GMO-free product	3.0%

METHODS

Online survey

Non-probability sampling weighted to the 2010 National Census

60% participation rate (1,051/ 1,751)

Identical orange juice bottles were manipulated so one used a label that read "GMO-free" and cost $3.49 while the other label had no additional information and cost $2.99.

Respondents had 10 seconds to decide which bottle they would purchase in the grocery store.

Respondents were asked to check all that apply when asked why they chose the orange juice bottle they did.

CONCLUSION

The non-loss frame did not resonate with majority of respondents (Liberman et al., 2005).

More than 40% of respondents were willing to pay a premium for GMO-free juice, which aligned with previous research (Riffkin, 2014; Wolfe et al., 2016).

Agricultural communicators need to work with growers and produce marketers to determine best practices for selling GMO citrus products if the technology is used to combat citrus greening.

Extension educators should collaborate to develop educational programming regarding the possible development and use of GMO orange juice.

UF|IFAS UNIVERSITY of FLORIDA AGRICULTURAL EDUCATION AND COMMUNICATION
UF|IFAS UNIVERSITY of FLORIDA
Center for Public Issues Education
KANSAS STATE UNIVERSITY

This project was funded by the USDA's National Institute of Food and Agriculture through the Specialty Crops Research Initiative/Citrus Disease Research & Extension. USDA NIFA Award No. 2015-70016-23028.

CONSUMERS' GENERATIONAL ENGAGEMENT IN WATER CONSERVATION: HOW EXTENSION CAN INCREASE ENGAGEMENT

PEYTON N. BEATTIE
DR. ALEXA J. LAMM
DR. LISA K. LUNDY

UF|IFAS UNIVERSITY of FLORIDA
AGRICULTURAL EDUCATION AND COMMUNICATION

UF|IFAS UNIVERSITY of FLORIDA
Center for Public Issues Education

INTRODUCTION

- Increasing population depleting water resources (Huang, Lamm, & Dukes, 2016)
- Conservation affects energy cost and resource availability (Cantrell, Warner, Lamm, & Rumble, 2016); (Owens & Lamm, 2016)
- Water is an important resource (Lamm, Lundy, Warner, & Lamm, 2016)
- Citizens' level of engagement vary depending on age or generation, knowledge level, culture, religion, and financial ranking (Viessman, n.d.)

THEORETICAL FRAMEWORK

- Audience segmentation
- Target audiences based on their geographical characteristics (Huang, Lamm, & Dukes, 2016)
- Generations are socio-demographic characteristic

OBJECTIVE

To indicate differences in the level of engagement in water conservation between generations

PURPOSE

To inform Extension professionals of the generational groups that should be targeted when developing water conservation programs

METHODS

- Online survey
- Non-probability sampling
- United States residents
- 524 respondents; 332 usable responses, conservation engagement statements did not apply to 192 respondetns
- Birth year coded to corresponding generation
- 10 statements used to gauge self perception of water engagement

RESULTS

- All generational groups participated in water conservation almost every time

Generational Engagement in Water Conservation

Generation	***n***	***M***	***SD***
Millennials	161	3.72	.70
Generation X	96	3.89	.58
Baby Boomers	71	4.15	.43

Note. Real limits of the scale were *1.00 - 1.49 = never, 1.50 - 2.49 = almost never, 2.50 - 3.49 = sometimes, 3.50 - 4.49 = almost every time, 4.50 - 5.00 = every time.*

- ANOVA identified a significant difference between generational groups ($F = 8.33$, $p = .00$)
- Baby boomers differed significantly from millennials ($p = .00$) and generation Xers ($p = .03$)

CONCLUSION

- Water conservation needs to be practiced every time
- Extension agents should segment baby boomers singly and millennials and generation Xers together
- Segmented groups will increase effectiveness (Huang, Lamm, & Dukes, 2016)
- Increased engagement will lead to susatainability of import resource
- Future research should identify motivators of engagement

Public Engagement Training Needs of Florida Extension Specialists

Introduction

- Extension provides research-based information to the public (NIFA, n.d.)
- Some land-grant faculty serve as state specialists (NIFA, n.d.)
- Consumers do not fully understand research (Napolitano, 2015)
- Scientists have felt unprepared to communicate (Lundy et al., 2006)
- Extension specialists need to know how to effectively communicate with the public

Purpose

- Assess the current public engagement training needs of Florida Extension specialists

Conceptual Model

- Expectancy-value theory (EVT) predicts behavior based on the expected outcome and value (Atkinson & Feather, 1966)
- Scientists do not highly value public engagement (Besley et al., 2016)
- Scientists do not participate in science communication due to lack of support and competencies (Ndlovu et al., 2016; Poliakoff & Webb, 2007)

Methods

- Online survey
- Census of Florida state specialists ($N = 253$)
- 45 complete responses (17.7% response rate)
- 18 five-point, Likert-type questions
- Analyzed in SPSS

Results

	Confidence in Public Engagement *M(SD)*	Likely to Participate in Future Training *M(SD)*
One-on-one conversations about **Extension focus area**	4.58 (0.92)	2.73 (1.51)
Traditional oral presentation	4.49 (0.92)	2.62 (1.51)
Lead small group discussion about **Extension focus area**	4.44 (0.94)	3.16 (1.41)
One-on-one conversations about **general scientific topics**	4.31 (0.87)	2.89 (1.51)
Demonstration at a community event	4.22 (0.88)	2.89 (1.48)
Lead small group discussion about **general scientific topics**	3.98 (1.07)	3.04 (1.35)
Use social media to promote **Extension focus area**	3.40 (1.18)	3.40 (1.25)
Write a science blog	3.31 (1.18)	3.40 (1.21)
Use social media to promote **general scientific topics**	3.20 (1.16)	3.18 (1.21)

Discussion

- Not as confident in using social media or writing blogs
- Not likely to participate in trainings
- May not see value in training or think it is outside their responsibility
- Training should focus on emerging media and emphasize personal benefits
- In-depth interviews could help better understand their motivation

UF|IFAS UNIVERSITY of FLORIDA AGRICULTURAL EDUCATION AND COMMUNICATION

UF|IFAS UNIVERSITY of FLORIDA Center for Public Issues Education

FYCS FAMILY, YOUTH AND COMMUNITY SCIENCES the science of helping people. together.

Taylor Ruth
Ricky Telg
Joy Rumble
Lisa Lundy
Angie Lindsey

GENERATIONAL PERCEPTIONS OF THE RELATIVE ADVANTAGES OF GENETIC MODIFICATION

Peyton N. Beattie, Dr. Alexa J. Lamm, Dr. Joy N. Rumble

INTRODUCTION

- Need for solution to feed expected population (United States Department of Agriculture, 2014)
- GM is a possible solution (Mahgoub, 2016)
- Consumers are undecided due to lack of understanding of advantages and setbacks (Mahgoub, 2016)
- Level of acceptance and recognition is also dependent upon generation
- Generations are classified by birth year and characterize people according to time period (The Center for Generational Kinetics, 2016)

PURPOSE

To inform the development of extension programs focused on educating about GM in relation to relative advantages of GM by generation.

THEORETICAL FRAMEWORK

- Theory of Diffusion of Innovations (Rogers, 2003)
  - Relative advantage

METHODS

- National online survey
- Non-probability opt-in sampling
- Sent to 1,751 US residents, 1,051 usable responses (60% usable response rate)
- Respondents rated their level of agreement or disagreement of relative advantages of GM
- 8 Likert-type statements
- Birth year coded to generational categories
- Relative advantage index was reliable ($\alpha = .91$)

CONCLUSION

- Education of GM science is important
- Knowledgeable consumers are more likely to make educated purchasing decisions
- Extension programs are advised to:
  - Target baby boomers and traditionalists
  - Inspire millennials and generation X to educate baby boomers and traditionalist
- Capitalize on advantages that are relevant to the purchasing consumer (price, taste, safety, availability, nutritional content, and quality of food produced) (Ringquist et al., 2016)

RESULTS

- Millennial and generation X agreed GM science provided relative advantage
- ANOVA indicated significant differences between generation groups ($F = 16.03$, $p = .00$)
- Significant differences:
  - Millennials and baby boomers ($p = .00$) and traditionalist ($p = .00$)
  - Generation X and baby boomers ($p = .00$)

Percieved relative advantage by generation

Generation	*n*	*M*	*SD*
Millennial	333	3.78	.64
Generation X	295	3.63	.78
Baby Boomer	312	3.40	.77
Traditionalist	107	3.44	.73

Note. Real limits of the scale: *1.00 - 1.49 = strongly disagree, 1.50 - 2.49 = disagree, 2.50 - 3.49 = neither agree nor disagree, 3.50 - 4.49 = agree, 4.50 - 5.00 = strongly agree.*

UF|IFAS UNIVERSITY of FLORIDA

Center for Public Issues Education

This project is funded by the USDA's National Institute of Food and Agriculture through the Specialty Crops Research Initiative/Citrus Disease Research & Extension. USDA NIFA Award No. 2015-70016-23028.

UF|IFAS UNIVERSITY of FLORIDA

AGRICULTURAL EDUCATION AND COMMUNICATION

The Role of Water in Agriculture:
Perspectives from the Nursery & Greenhouse Industry

Alexa Lamm, Ashley McLeod, Laura Warner, Melissa Taylor, & Pei-wen Huang

INTRODUCTION

The nursery and greenhouse industry requires large volumes of water.

Growers are criticized for not doing enough to protect natural water resources.

Extension have been working with nursery growers to increase adoption of conservation techniques but diffusion has been slow (Lamm et al., 2017) despite having an interest in conserving natural resources such as water (Lamm, Warner, Martin, White, & Fisher, 2017).

Understanding nursery and greenhouse growers' relationship with water may allow extension programs to be more targeted and lead to increased acceptance of new conservation techniques.

RESEARCH QUESTIONS

How does water play a role in nursery growers' everyday lives?

How do nursery growers feel about protecting water resources?

How do nursery growers intend to interact with water in the future?

THEORETICAL FRAMEWORK

General systems theory (von Bertalanffy, 1968)

Focus on the interrelationships between multiple elements, diverse structures, processes, and dynamics within a system

Sustainability is reached through the integrated scientific system (Slegers & Stroosnijder, 2008).

METHODS

Semi-structured one-on-one interviews with 24 nursery growers across the United States

Dispersed geographical locations of growers based on major nursery industry locations

Analyzed using the constant comparative method (Fram, 2013)

Themes were allowed to emerge naturally

Final results discussed with group of horticulture and extension faculty to ensure confirmability

RESULTS

The role water played in participants' everyday lives in the nursery or greenhouse

- Providing plants' basic water needs
- Facilitating chemical uses
- Maintaining control over product quality
- Facilitating business operation

Protecting water resources

- Doing the right thing
- Economic benefits
- Regulatory enforcement

Participants' future intention to interact with water

- Combating water issues
- Future movement in governmental regulation
- Seeking additional technology and information about water conservation
- Financial challenges

DISCUSSION

Extension professionals should incorporate local water issues and state regulations in programming.

Monetary investment and regulatory enforcement may be the major factors influencing growers' level of involvement in water conservation practices.

A national survey is recommended to gain a perspective that is generalizeable.

"...underwatering leads to overwatering which ultimately affects plant health contributing to lost sales."

"The application of pesticides [is needed] to try to control or eliminate [disease]."

"[We've] got the work toward sustainability. We can't just be here sucking up the Earth's resources, and be a zero-sum gain. It's got to be for the environment. We can't just be the taker."

"[Chlorine] is probably the most costly chemical application we make."

"Water is more precious than gold...between the availability of water and the standardization of what is clean water. Regulation is going to get more and more stringent. It's happening every year in every state."

"[It's] a huge financial benefit if we reuse and recycle 150 million gallons of water...It also provides us with insurance against a disruption in the water supply."

UF|IFAS UNIVERSITY of FLORIDA
AGRICULTURAL EDUCATION AND COMMUNICATION

UF|IFAS UNIVERSITY of FLORIDA
Center for Public Issues Education

This research is based upon work that is supported by the National Institute of Food and Agriculture, U.S. Department of Agriculture, under award number 2014-51181-22372.

COMMUNICATING ABOUT CIVIC ENGAGEMENT TO INCREASE PUBLIC UNDERSTANDING OF WATER POLICY AND REGULATION

Ashley N. McLeod & Dr. Alexa Lamm

INTRODUCTION

Uninformed voting can result from much of the public lacking agricultural literacy (Olper & Swinnen, 2013)

Public policy will continue to play an important role in natural resource management and water allocation (Krey, Adams, Escobedo, & Soto, 2016)

Purpose: Explore how public civic engagement in the voting process relates to familiarity with water policies could assist in increasing water knowledge and an informed public.

Priority 1 and 7 of the National Research Agenda (Roberts, Harder, & Brashears, 2016)

CONCEPTUAL FRAMEWORK

Civic engagement illustrates the conditions in which citizens engage in their communities in a civil society (Kim & Ball-Rokeach, 2006)

Largely influences whether or not someone is making informed decisions when it comes to taking civic action (Kim & Ball-Rokeach, 2006)

Individuals that are more civically engaged are also more knowledgeable when making decisions that impact their communities (Kawashima-Ginsberg & Levine, 2014)

METHODS

Data weighted on 2010 Florida Census

Familiarity of eight water-related policies and programs

Agreement or disagreement with five statements regarding how they would prepared to vote on policy that impacts agriculture and natural resources

Descriptive statistics and correlations analyzed using SPSS

FAMILIARITY WITH WATER POLICY

POLICY	NOT & SLIGHTY FAMILIAR	SOMEWHAT FAMILIAR	MODERATELY & EXTREMELY FAMILIAR
Clean water policy	49.2%	26.1%	24.7%
Air & water pollution control act	54.7%	25.4%	20.0%
The water quality assurance act	63.1%	19.5%	17.4%
Florida safe drinking water act	61.7%	20.8%	17.6%
Total maximum daily loads	79.4%	13.2%	7.5%
Basin management action plans	80.0%	12.8%	7.1%
Everglades restoration plan	60.9%	17.2%	22.0%
Florida spring initiative	79.4%	15.7%	12.0%

CIVIC ENGAGEMENT

STATEMENT	STRONGLY DISAGREE & DISAGREE	NEITHER AGREE NOR DISAGREE	AGREE & STRONGLY AGREE
I would seek information from multiple sources.	6.7%	21.1%	72.1%
I would seek to fully understand the policy.	4.9%	20.0%	75.1%
I would consider both the positive and negative implications that could result.	4.5%	17.1%	78.3%
I would discuss my opinions with others.	7.4%	38.3%	54.2%
I would ask others what their opinions are.	6.5%	36.7%	56.7%

RESULTS

Participants were generally not familiar or slightly familiar with water policy.

Participants indicated being agreement with all the civic engagement statements.
Civic engagement when preparing to vote index had a mean score of 3.78 (SD = .71)

Familiarity with water policy index had a mean score of 2.08 (SD = 1.00)

Pearson's correlation of the indices resulted in a coefficient of .20, a significant correlation with a small strength size.

CONCLUSION & IMPLICATIONS

A relationship between policy related to agriculture and natural resources and civic engagement exists.

Agricultural communicators can foster more informed voting through promotion of civic engagement.

Future research should determine if knowledge of other agricultural issues has a relationship with civic engagement.

UF|IFAS UNIVERSITY of FLORIDA
AGRICULTURAL EDUCATION AND COMMUNICATION

UF|IFAS UNIVERSITY of FLORIDA
Center for Public Issues Education

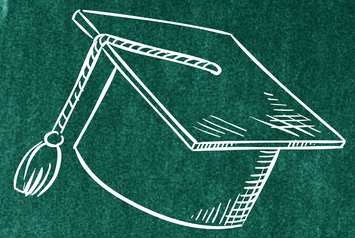
Kawashima-Ginsberg, K., & Levine, P. (2014). Policy effects on informed political engagement. American Behavioral Scientist, 58(5), 665-688. doi:10.1177/0002764213515219

Kim, Y.-C., & Ball-Rokeach, S. J. (2006), Civic engagement from a communication infrastructure perspective. Communication Theory, 16, 173–197. doi:10.1111/j.1468-2885.2006.00267.x

Kreye, M. M., Adams, D. C., Escobedo, F. J., & Soto, J. R. (2016). Does policy process influence public values for forest-water resource protection in Florida? Ecological Economics, 129, 122-131. doi:10.1016/j.ecolecon.2016.06.007

Roberts, T. G., Harder, A., & Brashears, M. T. (Eds). (2016). American Association for Agricultural Education national research agenda: 2016-2020. Gainesville, FL: Department of Agricultural Education and Communication.

Predicting Genetically Modified Food Opinion Leadership in Undergraduate Students



UF|IFAS UNIVERSITY of FLORIDA
AGRICULTURAL EDUCATION AND COMMUNICATION

UF|IFAS UNIVERSITY of FLORIDA
Center for Public Issues Education

Taylor K. Ruth, Joy N. Rumble, & Alexa J. Lamm

Introduction

- Students will serve as future leaders and address complex problems in the agricultural industry (DiBenedetto, Lamm, Lamm, & Myers, 2016)
- GM food is a current contentious topic (Andenoro, Baker, Stedman, & Weeks, 2016)
- Land-grant students likely more knowledgeable about GM food (Rumble et al., 2016) and can serve as opinion leaders

Conceptual Framework

- Opinion leaders
  - Knowledgeable and established in a community (Lamm, Lamm, & Carter, 2014)
  - Social influence and source of information (Aral, 2011; Lamm et al.,, 2014)
  - GM food opinion leaders like to think critically
- Need for Cognition (NFC)
  - Enjoyment in thinking about complex issues (Cacioppo & Petty, 1984)
  - Can be developed through in-class critical thinking activities (Rhoades, Ricketts, & Friedel, 2009)

Purpose

- Determine what characteristics predict GM food opinion leadership among undergraduates at a land-grant institution

Methods

- Population: College of Agricultural and Life Science at University of Florida
- Convenience sample (N = 718), 414 complete responses (58% response rate)
- Opinion leadership, GM attitude, knowledge, and NFC measured with Likert-type and bipolar semantic differential scales

Results

- GM Opinion Leadership: $M = 2.38$, $SD = 1.00$
- NFC: $M = 3.37$, $SD = .57$
- GM Knowledge: $M = 3.97$, $SD = .59$
- GM Attitude: $M = 2.67$, $SD = .99$
- Regression was statistically significant
- $F(3,410) = 42.85$, $p < .01$
- $R^2 = .239$

Predicting GM Food Opinion Leadership Using GM Knowledge, NFC, and GM Attitude

Variable	*b*	*p*
Constant	-1.39	.00
GM Knowledge	.68	.00**
NFC	.33	.00**
GM Attitude	-.02	.75

Discussion and Recommendations

- Low levels of opinion leadership and neutral attitudes
- High knowledge level
- Knowledge and NFC were predictors of opinion leadership
- Opinion leaders were knowledgeable about GM food
- Critical thinking in the classroom could facilitate opinion leadership
- Future research using classroom interventions

Funded by USDA National Institute of Food and Agriculture, Hatch project 1003955