



# Growing Future Agriscientists: Investigating Barriers to Research Projects

Eric Koehlmoos and Dr. Gaea Hock

# Introduction/Literature Review

- Companies in agriculture report a shortage of graduates in STEM fields (Goecker, Smith, Fernandez, Ali, & Theller, 2015)
- Science fair has been shown to influence career choice to a STEM career (Dutton & Sorenson, 2016; Sahin 2013; Schmidt, 2014)
- Kansas has had very low participation in the Kansas FFA Agriscience Fair
- There are many potential reasons why there is low participation (Voigt, Talbert, McKinley, & Brady, 2012)



# Theoretical Framework

- Based on expectancy-value theory
- Individual achievement determined by two factors
  - Expectancy for success
  - Subjective task values

# Objectives

- Investigate the barriers limiting agriscience research by Kansas agriculture programs.
- Investigate the reasons why Kansas agriculture teachers do not have students participate in the FFA Agriscience Fair.
- Identify ways to increase participation in the Kansas FFA Agriscience Fair.

# Methodology

- Survey was developed by researcher and distributed through Qualtrics
  - Sent to all Kansas agricultural science teachers ( $N=223$ ) in January 2017
- Response rate of 35% ( $n=79$ )
- 51.9% male ( $n=41$ ) and 48.1% female ( $n=38$ )
- Majority of participants between 26 and 30, with average teaching experience between 0 and 5 years ( $n=34, 43\%$ )

# Survey Instrument

- Consisted of qualitative and quantitative components
- 4 open-response questions
  - “What is your biggest struggle with facilitating research?”
  - “What are the obstacles you face in facilitating Agriscience Fair projects?”
  - “What is the biggest reason that you don’t compete in the FFA Agriscience Fair?”
  - “What advice do you have to improve the Kansas FFA Agriscience Fair?”
- Analyzed for common themes with constant comparison method

# Research Objective 1

- Objective: Investigate barriers limiting agriscience research
  - Time
    - *“Time, and adding more to a very full program and over committed students.”*
  - Student Motivation
    - *“Keeping kids motivated to continue on a project that has delayed gratification” [is a struggle]*
  - Experience
    - *“It’s hard to get kids motivated if I don’t know how to help them.”*
  - Lack of Resources
    - *“most high school Ag programs are not equipped to perform scientific research, lacking incubators, lab supplies etc.”*

# Research Objective 2

- Objective: Investigate reasons for low FFA Agriscience Fair Participation
- Major Themes:
  - Time
    - *"It takes a great deal of time. Students tend to burn out and loose interest in the middle of the experience."*
  - Student and Teacher Motivation
    - *"student desire to conduct research is not evident"*
  - Experience
    - *"Didn't know how to go about getting started"*
  - Lack of Research in Program
    - *"I don't incorporate research projects in class and have yet to have students show interest in the agriscience fair."*

# Research Objective 3

- Objective: Identify ways to increase participation in the Kansas FFA Agriscience Fair
- Major Themes:
  - Increased awareness and visibility of program
    - *"make sure you get students up to see it. That way it might spark an interest."*
  - Professional development for both teachers and FFA members
    - *"I'd like to see inservice at our summer and mid-winter conferences on how to implement into our classrooms."*

## Curriculum and Research Objective 3

- Find ways to incorporate research into curriculum
  - *"I think the perception is that it is harder to do than it really is. It is easy to incorporate in to classes and not be another "thing to do". I would suggest have trainings for teachers, particularly new instructors, on how to help students with the projects."*

# Conclusions

- Time is a major barrier to Agriscience Fair participation
  - Teachers-planning in curriculum, advising individual projects, paperwork, etc.
  - Students-planning enough time to perform projects, busy schedules, etc.
- Teacher motivation is low to compete in the event
  - Lack of tradition in chapter or in state
  - Results in a lack of a subjective norm

# Recommendations

- Find ways to incorporate more research and inquiry into curriculum
- Encourage more research-based SAE's
- Train preservice teachers about how to facilitate research
- Find ways to cut costs of projects
- Collaboration with science departments

# Thank You & Questions

- Thank you for attending
- Questions?