Growing Future Agriscientists: Investigating Barriers to Research Projects

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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 lose 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 into 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?