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Cover Page Footnote

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Preparing Undergraduates for Agriculture and Food Research Careers: An Internship Paradigm

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Abstract. The University of Missouri Integrated STEM Internship Program (MU-ISIP) is a 9-week internship experience that helps prepare undergraduates for the workforce or graduate school in four AFRI areas: (a) plant health and production, (b) animal health and production, (c) food safety, nutrition and health, and (d) agricultural economics and rural communities. This program helps address the need for the next generation of agriculturalists and food scientists through experiential learning. Additionally, it exposes undergraduates to Extension as a career option. This article outlines our approach to MU-ISIP and lessons learned during the program's inception.

INTRODUCTION

Extension has access to cutting-edge scientific knowledge generated at land-grant universities (Seevers & Graham, 2012). Additionally, Extension's connections with local communities provide an avenue for undergraduate experiential learning opportunities (Condo & Martin, 2002). Building on these strengths, the University of Missouri Integrated STEM Internship Program (MU-ISIP) brings together faculty from Extension's Agricultural and Applied Economics, Animal Sciences, Plant Sciences, and Nutrition and Exercise Physiology departments to help address the problem of workforce development in the area of agriculture and food research. It also exposes university students to Extension work, which sometimes has limited visibility on college campuses. Grounded in experiential learning, this summer internship program helps develop the next generation of the agriculture and food research workforce by embedding undergraduate interns in research, Extension, and professional development. The authors of this article serve as the principal investigator and co-principal investigators for the grant funding MU-ISIP.

HOW IT WORKS

Applications for the internship program are available to any Missouri resident who has completed at least one year at a public four-year institution, community college, or private college. Applicants rank their interest in four Agriculture, Food and Research Initiative (AFRI) areas: (a) plant health and production, (b) animal health and production, (c) food safety, nutrition, and health, and (d) agriculture economics and rural communities. Through online applications and phone interviews, up to eight undergraduates are selected for the internship each year. Interns receive a stipend for their 40-hour per week internship, a housing allowance, and one hour of elective credit.

By pairing interns with a primary campus research mentor as well as regional Extension specialists, they experience how research is conducted in an academic setting and then translated into educational programs and technical assistance. Research activities and regional involvement are determined based on faculty expertise, student interests, and current project opportunities. Faculty mentors, interns, and the program coordinator work together to make these decisions. Each intern receives an experience tailored to his or her interests, skills, experiences, and career aspirations.

For example, one of our interns who worked in the AFRI area of agricultural economics and rural communities was also interested in livestock. His research mentor helped him conduct research on maximizing profits in the

Table 1. Examples of MSU-ISIP Internship Experiences

Research Projects	Regional Extension Activities	Leadership and Professional Development Workshops
<i>Maximizing Profits for the Average Missouri Beef Cattle Herd</i>	Assisting with vaccinating and pregnancy checking heifers for the Show-Me-Select Replacement Heifer Program	Building trust with colleagues and customers Developing a social media presence Designing a strong resume Working with diverse teams
<i>Impact of repeated participation in an exercise program to improve physical function in older adults</i>	Co-teaching Stay Strong Stay Healthy classes to older adults in a rural community	Communicating with stakeholders

average-sized Missouri beef cattle herd, combining the student’s interest areas of agricultural economics and livestock. (See Table 1.)

In addition to research and extension activities, the program coordinator arranges leadership and professional development opportunities with campus faculty, staff, and industry professionals for the interns (See Table 1). Time for individual reflection and intentional processing through experiences with mentors is built into the program to help solidify learning. The internship is unique in that it ties together research, practical Extension field experience, leadership development, and professional development in a way that is student-centric and connects to the AFRI focus area.

The internship concludes with interns presenting their research activities in poster format at the Summer Undergraduate Research Forum on the University of Missouri campus.

LESSONS LEARNED

Looking back on our inaugural summer, two lessons stand out. We believe that other professionals developing internships will benefit from considering these lessons.

BE FLEXIBLE

Many Extension professionals say they enjoy their work because no day is ever the same. We wanted to make sure that our interns were not so tied to a calendar that they could “go along” with specialists to experience what an Extension career really looks like. This approach also gave interns the opportunity to meet more people and network with industry leaders.

To ensure flexibility, our intern cohort met with the program coordinator, faculty research mentors, and a regional Extension faculty member each Monday morning. We talked through learning opportunities available to students and together planned a “tentative” weekly agenda for each student. However, there was a shared understanding that if other opportunities arose, the intern, primary faculty mentor, and program coordinator could work together to amend the schedule.

BE RESPONSIVE TO STUDENTS’ KNOWLEDGE, INTERESTS, AND EXPERIENCES

We wanted our interns to learn in a context that appealed to their interests and helped them advance in their field of study. Ideally, mentors and students should work together to determine research activities and field involvement. This strategy helped engage the interns while allowing them to connect their prior knowledge and experiences to new information.

IMPLICATIONS AND CONCLUSION

Experiential learning can help prepare and inspire a future workforce that will obtain jobs and continue to grow in the four AFRI areas. Extension internships have the potential to help students understand their coursework on a deeper level and to apply their knowledge in an authentic work setting (Eyler, 2009; Jacoby, 2015). In a post-program email survey conducted during the summer of 2019, one intern explained, “I have gained so much from

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this internship that can't be learned from a textbook. The connections I have made, the people I have met, the daily conversations with mentors and other professionals...it has opened my eyes to the many different opportunities and careers there are in agriculture today.”

In addition to developing the future workforce in agriculture and food research, this program provides an opportunity to recruit the next generation of Extension professionals. Arnold and Place (2010) suggest that successful strategies for recruiting young people to Extension include one-on-one interactions with Extension educators and specialists. Although interest in an Extension career had not been specifically mentioned on our students' internship application forms, several interns indicated interest in an Extension career on the post-program evaluation.

Through concrete experiences, the interns develop a deep understanding of Extension's mission and values. One intern reflected, “Extension works to help Missouri residents comprehend relevant research in their desired area by extending knowledge in a manner that can be understood with no research background.” Another stated, “When we work out in the regions, it's easy to see that so much of what Extension does could not happen without the connections and trust field specialists have built with the people in that area.”

Placing interns at the center of campus-based research, practical application of research in communities, and professional development make this paradigm unusual. Maintaining a flexible and student-centered experience helps ensure program quality. It is our intention that other Extension professionals will explore and adapt this paradigm, benefiting from our lessons learned.

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