

## Extension Education

# Building Up the Next Generation of Extension Specialists

Tori L. Marshall<sup>a</sup>, Amy D. Hagerman<sup>b</sup>, Hannah E. Shear<sup>b</sup>, Kenneth H. Burdine<sup>c</sup>, and Becca B.R. Jablonski<sup>d</sup>

*University of Tennessee<sup>a</sup>, Oklahoma State University<sup>b</sup>, University of Kentucky<sup>c</sup>, and Colorado State University<sup>d</sup>*

JEL Codes: A23, Q10

Keywords: Extension education, graduate student training, mentoring

### Abstract

This paper is a retrospective summary of the varied ways agricultural economics and agribusiness programs have approached recruiting and training interested graduate students for a career in Extension. There is no one-size-fits-all solution for graduate student recruitment and training. Extension systems vary by state, and departments have different levels of Extension involvement. Aptitude in research and teaching, while critical, should be complemented by skills needed to establish successful Extension programs. We propose a customized approach to Extension career training for graduate students that is adaptable to the Extension presence in the department and college and flexible to meet graduation requirements. This flexible approach will enable faculty graduate advisors, graduate coordinators, and department and Extension leaders to better prepare graduate students for future careers in Extension, furthering the land-grant mission.

## 1 Introduction

In 2020, less than 2 percent of the U.S. population lived on farms and ranches (American Farm Bureau 2021). Non-metro populations have been trending downward since the 1990s (USDA ERS 2020). Consequently, fewer students with agricultural backgrounds are entering agricultural economics/agribusiness undergraduate and graduate programs. At the same time, there is growing interest in food and highly diverse agricultural issues from urban stakeholders. This creates opportunities to recruit graduate students from a wide variety of backgrounds (Taylor and Zhang 2019).

The growing disconnect between the majority of the U.S. population and basic knowledge of agriculture and food production makes the land-grant mission and specifically the outreach responsibilities of Extension more critical than ever. Land-grant universities have a responsibility to disseminate research-based information, yet funds for Extension programs in many states have been shrinking for several years. Extension faculty create a bridge between their department, county, or regional Extension educators, policy makers, and other stakeholders. When done well, an Extension faculty member's program can build the external reputation of the department and university, in turn garnering more resources and job opportunities. Further, a strong Extension presence creates additional opportunities for external funding, particularly for agencies like the United States Department of Agriculture National Institute for Food and Agriculture (USDA NIFA) integrated programs.

While the opportunities associated with building new relationships with diverse stakeholders and exploring practical applications for increasing diversity of food and agricultural topics are exciting, it also creates a challenge for graduate training programs. Interested students may not have had much if any, exposure to Extension as youth or undergraduates. Further, fewer faculty advising the graduate students in departments have practical Extension experience. Graduate programs wishing to successfully place graduates into Extension careers need to make a concerted effort to recruit interested students and provide the training and tools required to build a successful Extension program that is tied to a robust research agenda. The diversity of graduate students may create an opportunity to hire a more diverse Extension faculty. Taylor and Zhang (2019) point out that shaping the Extension workforce of the future will likely include hiring individuals who closely resemble consumers of agricultural goods and may

require hiring greater numbers of women, members of historically underrepresented groups, and international economists.

Today's Extension audiences are rapidly changing and evolving as more and more information is readily available from a variety of sources, reliable or not. It is imperative that early-career Extension professionals have the skills to meet audience demands and provide reliable information. Extension roles differentiate themselves from other roles in an agricultural economics department in key ways. Communication skills to disseminate research-based information to stakeholder, rather than academic, audiences need to be developed. Extension roles also require the individual to build relationships with key stakeholders in the state, network with people from many different backgrounds, and stay abreast of the latest topics and trends of interest. An Extension specialist needs to be nimble in responding to urgent information requests and media calls and be able to adjust priorities quickly. Without proper training or direction, graduates with limited Extension knowledge or experience may grow frustrated or overwhelmed when hired into positions that include an Extension split. They may also be advised by faculty without Extension appointments to focus solely on research at the expense of finding ways to develop meaningfully integrated research-Extension programs. While it is reasonable that a great deal will be learned in the early years of a faculty member's career, regardless of position split, a basic understanding of Extension and core tools to successfully navigate an Extension career only increases the likelihood of success and retention of individuals.

This paper will address the varied ways tenured faculty, department heads, and deans can engage graduate students in Extension. Approaches may include field experiences like internships and apprenticeships, classroom experiences like seminar classes and practicums, integration into externally funded projects, certificates, or degrees specifically targeting Extension careers, and mentoring. This article is intended to act as a toolkit, with a variety of options that can be flexibly adapted to the needs of the institution.

## **2 Benefits of Graduate Student Engagement in Extension**

It is not uncommon for graduate students in agricultural economics to have very little understanding of Extension when they enter graduate school. Many of them may come from countries or regions that did not have an Extension system, others may have simply not been involved with Extension during their lives, and many more will have received previous degrees from non-land-grant institutions where Extension faculty were not present. Extension engagement becomes important as the students can get a window into an Extension faculty member's role in the land-grant system. They are likely familiar with the scholarship of teaching, as they have been students for a significant share of their lives. Graduate programs are typically research-oriented, so students also receive considerable exposure to the scholarship of research. However, they are likely to be less familiar with developing educational programs for stakeholders, writing for audiences that are not trained economists, working with colleagues in other disciplines, and interacting with government agents, commodity groups, media members, and so on.

For departments, Extension engagement creates a broader pool of skills that can be applied to many different positions, including those in government or industry. Such well-rounded students reflect well on the program and are situated well for success in the future. Students gain an improved understanding of how to develop applied research applications based on practical problems and may find deep satisfaction in the service-oriented nature of Extension for their career. Regardless of whether a student pursues an Extension career, some level of engagement in Extension activities during graduate school enriches their educational experience.

### 3 Approaches for Graduate Student Engagement in Extension

Approaches for graduate student engagement range from individual relationships to classroom activities, from an engagement that likely requires no additional support from the department or university to approved graduate degrees. For this paper, these approaches are organized into three broad categories: university or departmental initiatives, hands-on training, and one-on-one mentoring. All approaches have pros and cons, and the feasibility of implementation will depend on the individual department.

#### 3.1 University or Departmental Initiatives

Some efforts to engage graduate students in Extension are broadly implemented at the department or college level. This includes departmental seminars and classroom activities or even formal degree programs. The first two initiatives are generally limited in nature, providing general information to all graduate students. These engagement areas are particularly beneficial for those who may want to know more about Extension, but may not necessarily be targeting Extension careers. They can also be a useful recruiting tool for those who may not have considered an Extension career before. Students may develop an interest in engaging more deeply in experiences alongside an Extension mentor. In contrast, a formal degree program or certificate provides a deep focus on Extension skill development through classroom experiences but is rare in agricultural economics programs.

##### 3.1.1 Seminars to Engage Graduate Students in Extension

Departmental seminars are relatively common across agricultural economics departments as a way for faculty, staff, and graduate students to share their work with colleagues and get feedback. Seminars typically offer some flexibility in terms of what can be presented or discussed, which can allow an opportunity for graduate students to become engaged with Extension by attending and participating in the seminars. Through a series of seminars, graduate students can be exposed to Extension faculty, see applied research that includes an Extension component, develop an appreciation for the scholarship of teaching economic concepts to lay audiences, and can potentially present Extension programs they have developed as part of their graduate work. However, if one goal of a seminar series is to expose graduate students to Extension, seminar planners must be deliberate in their planning to achieve this.

In departments where seminars are held regularly, graduate students are often frequent participants. Seminar attendance is typically an expectation for graduate students, and the majority of them are very interested in learning more about the work of the faculty and staff in the department. For this reason, graduate students are largely a “captive audience,” which provides an opportunity to use a seminar series as a vital element of their graduate education. For that reason, it seems prudent to incorporate Extension as part of those seminars if exposing graduate students to Extension and preparing graduate students for Extension faculty positions is a goal of the graduate program.

A basic seminar on the Extension element of a land-grant institution may be the first exposure to Extension for many graduate students. A basic introductory seminar can be pretty high level and can be delivered by an individual or a team of Extension faculty, but it simply needs to convey that Extension is the outreach arm of the institution. Graduate students likely want to see their work have application in meaningful ways for real businesses and households. Planting this seed early will likely pay dividends as they move through their programs. While a high-level overview of Extension is necessary, seminars can also provide an opportunity for a deeper dive into an individual Extension faculty member’s program. A seminar of this type has the potential to expose the broad scope of work that Extension faculty are engaged in within their department.

Additionally, seminars offer the opportunity for graduate students to be exposed to faculty whose primary job is to take what is learned through research and explain it in a way that can be understood by individuals from a wide range of backgrounds. Agricultural economics research tends to reward methodological rigor, often at the expense of practical application. However, Extension faculty must focus

on implications and applicability as they work with clientele. Elements of this can be incorporated in almost any seminar by spending some time discussing practical findings and potential Extension applications. However, this likely occurs most efficiently when research and Extension colleagues collaborate on work, as they both bring strengths to the table. It is also important that graduate students see the type of programs that are delivered directly in Extension settings. There is certainly nothing wrong with using seminars for this very purpose, but the same could also be accomplished by mentoring and/or field experiences, which are also discussed as part of this paper.

A clear advantage of utilizing seminars as an Extension engagement method is that it can be a relatively low-cost strategy to implement as part of a graduate program. Most land-grant institutions that would potentially be preparing graduate students for Extension careers have faculty that can present seminars on their Extension programs or deliver the same type of program that they would deliver in the field. In addition to being a relatively low-cost approach, utilizing Extension team members within the department also increases the likelihood of Extension faculty being involved with these graduate students throughout their programs. These same faculty also have the potential to serve on graduate committees, work with students to incorporate Extension elements into their theses and dissertations, and provide valuable input into the delivery and presentation of research findings to maximize their impact outside of academia.

While there are many reasons to have departmental Extension faculty very involved in seminars, there are also reasons to involve faculty from other institutions. First, as Extension faculties become smaller over time, faculty are increasingly relying on expertise from other institutions to serve the clientele. Graduate students need to understand this dynamic and know that there is a network of professionals doing similar work that can be a professional resource for them when they move into faculty positions. Secondly, Extension is defined and implemented very differently across states and institutions. Graduate students who are primarily exposed to Extension in the state of their educational institutions may be surprised when entering the job market and realizing how different Extension expectations may be in other states. By providing graduate students with the base knowledge of Extension programming and differing expectations across universities, students are likely to be more competitive in the job market, and the likelihood of success in their accepted Extension roles increases.

### **3.1.2 Graduate Student Extension Engagement in the Classroom**

The structure of land-grant colleges, and their respective Extension or cooperative Extension program, varies widely across the United States. The complex and diverse nature of Extension makes summarizing and characterizing the graduate student Extension experience difficult. In general, graduate students most often encounter Extension indirectly through the classroom and other outreach opportunities, such as a conferences or workshops. Occasionally, an Extension economist has a split appointment, which includes a formal teaching role. In that way, faculty may be more inclined to bring Extension concepts into the classroom. But more often than not, graduate students do not directly learn of Extension in an agricultural economics classroom setting.

While programs such as Agricultural Education and Agricultural Leadership often incorporate Extension education formally into their curriculum, many agricultural economics programs do not have a formal course, an issue discussed more fully in the next section. Incorporating Extension education and information in the graduate student classroom setting is a cost-effective and “low hanging fruit” approach to expose students to Extension during their studies. Faculty can present a brief introduction of Extension or can utilize Extension faculty to provide a guest lecture to introduce basic concepts and share how they integrate their research and Extension program.

Skills needed for a career in Extension may however be built into many common and required economics courses. Policy communication and written communication skills are often common requirements for graduate-level courses. Class projects and public speaking, while not explicitly or singularly for careers in Extension, are classroom experiences that can prepare a graduate student for

Extension. Additionally, many graduate courses require students to complete a research project and paper.

To better prepare students for Extension, course requirements could be expanded to include a fact sheet or public communication piece on research findings. Programs could also simply encourage (or require) students to take an Extension education course often offered by the Agricultural Education Department or the Education College. The challenge, however, with this approach is that it may neglect to incorporate methods and tools that are distinctly used by agricultural economists.

### 3.1.3 Graduate Student Extension Certificates and Degree Programs

Degree programs focusing on Extension education are often part of the Agricultural Education and Communication Departments. These programs often include coursework focused on pedagogy, program evaluation, marketing educational programming, and the scholarship of teaching and learning with adult students. Agricultural Education programs across the United States offer graduate degrees with a focus in Extension Education like those of Iowa State University<sup>1</sup> and Ohio State University.<sup>2</sup> Some schools offer specific master's degrees in Extension education like those of Maryland,<sup>3</sup> North Carolina State University<sup>4</sup> (NC State), and Colorado State University<sup>5</sup> (CSU).

Certificates in Extension education can also be earned at various universities throughout the United States. CSU offers a certificate in Extension Education; the certificate can be earned online and requires 13 credit hours. The certificate program allows students to explore the ages and stages of learning, and gain specific skills in content delivery methods, including one-on-one meetings, the classroom, online, seminars, and conferences. NC State's certificate program requires participants to complete 15 credits, or five of the following classes: Program Planning in Agricultural and Extension Education, Adult Education in Agriculture, Leadership and Management of Volunteers in Agricultural and Extension Education, Organizational Behavior and Administrative Leadership in Agricultural and Human Science, Evaluation in Agricultural and Extension Education, International Agricultural Development, and Practicum in Agricultural and Extension Education.

Earning a certificate in Extension education is not the goal of this discussion, but what is notably missing in agricultural economics graduate programs is any formal incorporation of such classes into programs. Given the importance of teaching and communication in Extension, as well as teaching, educational courses in Extension could provide students opportunities to prepare for a career in Extension.

## 3.2 Hands-On Extension Training for Graduate Students

Students who are interested in developing the skills necessary to become Extension faculty or staff may choose to explore practical training and experiences, including internships as undergraduate or graduate students, practicums or field training, or apprenticeships through Extension associate or postdoctoral programs that are externally funded.

### 3.2.1 Internships

There is significant evidence pointing to the benefits of experiential learning in supporting improved learning outcomes for students (e.g., Burch et al. 2019). Accordingly, several land-grant universities

---

<sup>1</sup> <https://www.ageds.iastate.edu/graduate/agricultural-extension-education-specialization>

<sup>2</sup> <https://acel.osu.edu/graduate>

<sup>3</sup> <https://psla.umd.edu/master-extension-education>

<sup>4</sup> <http://catalog.ncsu.edu/graduate/agriculture-life-sciences/agricultural-extension-education/#degreestext>

<sup>5</sup> <https://www.online.colostate.edu/certificates/teaching-extension/>

across the United States have Extension internship programs, in which undergraduate or graduate students are paired with mentors in Extension to complete an engaged project.

As one example, Oklahoma State University (OSU) students across disciplines are placed in county Extension offices for the summer and experience a wide variety of activities from farm visits to 4-H camps. In addition, students can design and implement their own Extension programs in that county. Other programs focus more on the link between county and state offices. For example, CSU started its Extension Internship Program in 2018, following a request from Extension leadership to (a) find opportunities to facilitate enhanced connections between campus and field, as well as students and Extension, (b) ensure that applied research conducted by CSU faculty better met the needs of Colorado stakeholders and that Extension conveyed research opportunities to campus, and (c) find opportunities to train graduate students to become the next generation of Extension employees. Interns, who can come from any college/discipline at CSU, glean an understanding of the complexities of working across state, county, and university constructs in addition to specific internship goals. An important dimension of the program is that it is overseen by a committee made up of campus-based faculty, Extension specialists, and Extension agents. One benefit of this approach is that students are forced to communicate across campus and the field, identifying opportunities to bridge research with Extension programming. Often the student has a preexisting relationship with a faculty member in their discipline but lacks connection to the communities that understand the complexity and importance of the issue. Working with the faculty member, graduate students also grasp how research results can be most effectively disseminated to appropriate audiences.

With the interest of CSU's Office of the Vice President for Research in the program, the entire CSU faculty received the call for faculty/staff Extension internship proposals. This direct messaging from a senior university official expanded information about the program to faculty less involved in and aware of Extension who then were able to potentially forward to graduate students. Now faculty and staff with and without official Extension appointments can help to advertise the internship opportunity to a wider breadth of students. Perhaps as a result, in 2020, only 17 percent of the interns reported that they were extremely familiar or very familiar with Extension before their internship. Many students (41 percent) reported that the internship opportunity was their first introduction to Extension.

Many graduate students have reported using information from their CSU Extension internship in master's theses and dissertations. Further, almost all past interns report in postevaluation surveys that they are likely to consider a career or recommend a career in Extension to a friend. With programs such as this, universities may have opportunities to attract a more diverse audience to careers in Extension.

### 3.2.2 Practicums and Field Experiences

In the 1980s, both Cooper (1980) and White (1982) argued that doctoral graduate students had little opportunity to acquire effective teaching skills given that many programs in the realm of agricultural economics focus on the understanding and application of the subject matter. Since this discussion, teaching practicums have become an integral part of agricultural economics graduate programs. Forty years later, the same argument can now be given about the lack of opportunities for experience and skills desired by the Extension component of land-grant universities. One way that graduate students with an interest in entering the Extension field can build their skills and knowledge is through practicums and field experiences. More common are internships and practicums in agricultural economics programs for undergraduates, while fewer universities offer formal Extension practicums for graduate students entering into Extension faculty positions from agricultural economics programs.

A practicum would be considered a graduate-level course that is designed to provide students with opportunities for practical Extension applications of their concurrently studied field of agricultural economics. The primary task during a student's practicum would be observation and documentation. A practicum in Extension can be designed for both students knowledgeable in the area as well as those who are new to the concept. A practicum developed with this audience in mind can provide students the

opportunity to learn about the elements of base Extension programming and the effective skills needed to implement a successful Extension program.

With experienced Extension specialists serving as instructors for this practicum, graduate students have opportunities to start with a broad overview of the field and as the practicum progresses through the semester, dig deeper into specific matters directly associated with Extension. Subject matter for a practicum can include but is not limited to, developing programs for stakeholders, writing for audiences not trained in economics, interdisciplinary work, working and communicating with media, and program marketing and evaluation. Implementation of such a method would require the commitment of Extension faculty in the department willing to teach and mentor enrolled graduate students. Although the ultimate goal of an Extension practicum is to provide students with a base knowledge of Extension and the opportunity to observe seasoned Extension specialists in their roles, an end goal of such a practicum would also be preparing graduate students for Extension faculty positions by honing Extension skills through field experiences.

Field experiences, or hands-on training, allow students interested in an Extension career to receive firsthand experience of working in an Extension specialist role. Similar to faculty who oversee teaching practicums where a graduate student serves as the primary lecturer, Extension faculty would assist graduate students and provide opportunities for them to present in front of stakeholder audiences. By providing field experience, such as presenting a market outlook, students can learn how to design Extension presentations, gather market data from various sources, and then how to disseminate that information to stakeholders. Extension faculty would assist students in the preparation of presentations as well as answer questions or concerns students may have about presenting to Extension audiences versus academic audiences. By providing graduate students opportunities to gain field experience, not only are departments helping prepare students for careers but also assisting those who may be on the fence about career paths to determine if this is the proper direction.

Field experience allows graduate students to participate in the work of an Extension specialist in a limited way under supervision. This experience can be included in the practicum or after completion of the course to allow students to gain firsthand experience of working in an Extension specialist role. Integrating field experiences into a practicum or continuing through a student's graduate career can help students not only develop their research skills but also explain the same research to audiences with various backgrounds. The goal of such opportunities is to assist graduate students in producing applicable research, which is typically desired in the land-grant mission, and understandably disseminating their work to stakeholders. By utilizing field experiences that can be associated with a graduate student's current dissertation work, they can build their strengths in both research and Extension simultaneously. Another benefit of creating field experiences as part of a practicum is the ability to receive not only experience but also credit for their dissertation.

The goal of practicums and field experiences is to allow students to observe Extension and to gain valuable experience in Extension applications. Although practicums would have to stay broad in some aspects given that Extension is defined and implemented very differently across states, the basic skills will be applicable for all Extension programs and when gaining field experiences. By integrating field experiences into practicums and developing well-rounded scholars, graduate students with this experience will be more competitive in the job market and more likely to see success in their beginning Extension careers.

### **3.2.3 Apprenticeships and Externally Funded Projects**

An apprenticeship is a common requirement in many trade-based fields, consisting of full-time employment doing hands-on work under the supervision of a "master" in that craft. In the context of this paper, apprenticeships take the ideas of practicums and field experiences one step further for a more extended or in-depth experience. Although rarely referred to formally as an apprenticeship, there are a few ways in which apprenticeships are incorporated into agricultural economics programs and state

Extension systems. This section will mainly focus on Extension associates and postdoctoral Extension positions. In both cases, positions may be funded by external money or on a nonpermanent basis and would likely have a focused set of priorities. This targeted position scope helps the “apprentice” focus tightly on one program, and can help the individual gain critical skills under the tutelage of an experienced supervisor. The benefit of an apprenticeship approach to Extension education is that graduate students have the opportunity to work under the supervision of one or more state specialists while contributing toward building or continuing an Extension program, conducting evaluation, and even being involved in applying for external funding or funding agency reporting. These intensive roles can combine various aspects of the previously described areas of engagement.

Graduate students can be hired as “Extension associates” or “research associates” supporting Extension programs to gain practical experience that could be applied to a future Extension specialist position. There is a great deal of diversity of Extension associate roles across the country, ranging from graduate students working full-time while completing an advanced degree to seasoned professionals in nontenure track positions that are solely responsible for critical state programs. However, the focus here is on the potential to use Extension associate positions for training. Similarly, after a Doctoral degree is completed, a student can be hired into a temporary postdoctoral position. Like many, postdoctoral positions are designed to enhance skills for research and encourage publication, a postdoctoral role with an Extension function builds credentials and skills as well as a body of programs and products for future Extension faculty positions.

The development of Extension associate and postdoctoral positions can be challenging and often require both external funding and support from the broader college and university level.

Graduate students participating in apprenticeship positions may also have opportunities to gain skills by participating in externally funded projects. Many USDA NIFA grants have opportunities for “integrated” applications, including research and Extension components. These integrated projects represent a significant opportunity to train graduate students to serve as the next generation of research Extension faculty.

First, most integrated projects include an Advisory team, which is usually made up of relevant governmental, nongovernmental, and agricultural producer partners. Graduate students funded on these projects can be put in charge of managing the Advisory teams. In this way, students get a richer understanding of why researchers are answering particular questions, what are the data available to address them, and how stakeholders intend to use the research results.

As an example, as part of an ongoing USDA NIFA funded project, a CSU graduate student overseeing an Advisory team on a “farm-to-school” project has built strong relationships with partners in state Departments of Agriculture, Education, and nonprofit organizations. In managing the Advisory team, the graduate student has learned to understand the importance of the research question—including why it is relevant, timely, and important to different stakeholders including policy makers. They have also been able to leverage the committee to procure novel data sets, and then understand nuances of the data that only practitioners would understand. The stakeholder engagement has also supported an enhanced understanding of context, which in turn leads to the incorporation of explanatory variables that might otherwise have been omitted. Finally, the graduate student has gained a richer understanding of how the stakeholders intend to use the results, including how the data need to be presented for incorporation into outreach materials and programs.

A benefit of student involvement in integrated projects is that outputs from integrated products include peer-reviewed research articles along with alternative mechanisms for results dissemination and programming. This can include deliverables such as incorporation into existing programs, creation of web-based materials, which can include infographics and fact sheets, and presentations to diverse stakeholders. Presenting results to different audiences forces students to be able to frame and communicate the relevance of their work in adaptable ways—great training for research Extension faculty.

### 3.3 One-on-One Relationships Through Mentoring of Graduate Students

Perhaps one of the most accessible and powerful means by which a graduate student prepares for an Extension career is to mentor under an Extension faculty member. A mentoring program can be integrated into every one of the engagement activities previously described, or it can also be as simple as a series of conversations with an Extension faculty member on what Extension is and how it serves the land-grant mission. Mentoring is, at its core, the process of advising or training another person. Mentoring is less financially demanding than some of the other engagement types described, but to be successful, mentoring requires a time commitment by both the mentor and mentee. The mentor doesn't need to be the student's graduate advisor, although a faculty member may serve both roles. However, it is important that a graduate advisor and graduate student develop rapport through active listening and frequent engagement. The goals of the mentee should be clear at the onset as well as the commitment of both.

Extension mentoring relationships often are allowed to develop organically, at the behest of the graduate student, rather than being actively nurtured by faculty or department leadership. A challenge agricultural economics departments face in the organic development of those relationships is that Extension faculty tend to have fewer contact points with graduate students since they teach fewer graduate courses than those with teaching/research splits. These mentoring relationships can be encouraged through activities like classroom engagement of Extension faculty for guest lectures, dedicated seminars that include Extension topics, and active engagement of Extension faculty in helping graduate students create Extension publication applications of relevant, applied research (all activities which are mentioned above as Extension education opportunities).

Extension faculty can enhance students' education through practical and "ride-along" experiences that create opportunities for deep conversations going down the road as well as practical experience with the stakeholders and audiences Extension serves. At the end of the day, graduate students may be recruited and retained in Extension roles through the networking and positive experiences associated with dedicated mentors.

## 4 Challenges to Graduate Student Engagement in Extension

Each of the methods described above requires time and monetary resources on the part of the university and department for implementation, to varying degrees. Administratively, Extension has faced a trend of declining audiences in the agriculture space that agricultural and natural resources economists most often engage with. This is associated with declines in the number of individuals engaged in agriculture, which is less than 1 percent of the population (Census 2010) as compared to more than a quarter of the population a century ago. Deans and department heads are securing resources and support from university and state leaders who may not have personal value for Extension or may not understand the value of training students in Extension skills.

The development of any of the engagement activities requires administrators at all levels of the university to actively understand the value of Extension and the support that it can build for their units. This can begin by emphasizing the critical importance of developing excellent Extension professionals as a fulfillment of the land-grant mission and the difficulty of hiring qualified faculty to fill Extension roles. The engagement activities listed in this article provide benefits to students and faculty and incentivize student participation by offering experiences, publications, assistantships, and in some cases, class credit for their effort. It also creates a feedback loop whereby the land-grant university system as a whole is strengthened by training students before they become faculty with joint appointments.

New faculty holding joint Extension and research/teaching appointments, but with no training in Extension prior to taking a position, may struggle to establish successful programs in their state. The faculty member with limited to no Extension training must (1) learn through trial and error creating a highly stressful situation and potentially spending less time on teaching and research or (2) face pressure

to spend time and money on activities that are more favorably viewed by senior faculty on tenure and promotion committees—research and publications. Teaching faculty face similar challenges as they develop new classes, yet fewer resources are available to support Extension skills development, than teaching skills development, in new faculty. This can leave those faculty with joint appointments with incentives to expend greater time, effort, and resources training students in research or teaching without incorporating Extension elements. Investing in Extension workforce development benefits the university as a whole when those students become the next generation of faculty.

Incentivizing faculty time and effort in graduate student engagement can be both tangible and intangible. Tangibly, providing fellowships and scholarships for graduate students eases the burden on faculty and highlights the value of Extension training for incoming graduate students. Seeking additional funds within the university systems is difficult under tightening higher education budgets. External funding agencies are encouraging more integrated projects that combine research with Extension or teaching. However, funding Extension graduate student activities through competitive grants does not always solve the problem of improving visibility in the university and among the graduate students.

Intangibly, Extension faculty engagement with graduate students should be held in similar regard as research. Mentoring graduate student research is viewed positively in tenure and promotion reviews, as well as the publication of journal articles with students. Mentoring graduate students in Extension programming and the publication of Extension materials should be similarly rewarded in that process. These activities should be clearly spelled out in Evidences of Scholarly Activity, and other documents that are intended to describe valuable outputs for promotion and tenure reviews. Colleges could also provide awards for excellence in Extension, like those provided by professional associations.

## 5 Conclusion

The number of Extension positions across the United States may not be steadily increasing, but the audiences demanding Extension programs are growing and evolving daily. Extension still has a vital role in departments today, sharing research information with diverse audiences and bringing research application ideas and timely problems back to the department. The next generation of Extension specialists will reflect the changing population as departments recruit graduate students with diverse backgrounds. Yet, challenges exist to graduate student training in Extension. Namely, funding and administration support for those activities. This paper provides options to engage and recruit students from both traditional agriculture and nontraditional backgrounds to address the demand for Extension faculty. Departments can utilize a variety of tools to train interested students to become successful Extension professionals. There is no singular way to implement formal Extension education into a graduate program, but by bringing the long awaited conversation of needed Extension education in agricultural economics programs to the table, programs may be able to develop and define programs best suited for their departments.

**About the Authors:** Tori L. Marshall is Area Farm Management Specialist at the University of Tennessee. Amy D. Hagerman is an Assistant Extension Professor at Oklahoma State University (Corresponding author: [amy.hagerman@okstate.edu](mailto:amy.hagerman@okstate.edu)). Hannah E. Shear is an Assistant Professor at Oklahoma State University. Kenneth H. Burdine is an Associate Extension Professor at the University of Kentucky. Becca B.R. Jablonski is an Associate Professor at Colorado State University.

## References

American Farm Bureau. 2021. "Fast facts about agriculture and food." Available online at: <https://www.fb.org/newsroom/fast-facts>.

Burch, G.F., R. Giambatista, J.H. Batchelor, J.J. Burch, J.D. Hoover, and N.A. Heller. 2019. "A Meta-Analysis of the Relationship Between Experiential Learning and Learning Outcomes." *Decision Sciences: Journal of Innovative Education* 17(3): 239-273.

United States Department of Agriculture Economic Research Service (USDA ERS). 2020. "Rural America ends first-ever period of population loss." Available online at: <https://www.ers.usda.gov/data-products/chart-gallery/gallery/chart-detail/?chartId=58278>.

Cooper, C. 1980. "New Faculty Orientation to Teaching." *North American Colleges and Teachers of Agriculture Journal* 24(2):24-25.

Taylor, M., and W. Zhang. 2019. "Training the Next Generation of Extension Economists." *Choices* 34(2):1-7.

White, F.C. 1982. "Teaching Practicum in Agricultural Economics." *North American Colleges and Teachers of Agriculture Journal* 26(2):4-7.