

Teaching and Educational Commentary**Faculty Perspectives on Engaging Undergraduates in Agricultural and Applied Economics Research**John Lai^a, Jerrod Penn^b, and Misti Sharp^a^aUniversity of Florida, ^bLouisiana State University and LSU Agricultural Center

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Abstract

Preparing the next generation of agricultural economists is critical to providing solutions to the numerous challenges faced within agriculture. Although undergraduates benefit from undergraduate research (UR), there is limited understanding of why and how faculty incorporate undergraduates in their research programs. To examine this issue, this study seeks to increase: (1) understanding of the motivations, (2) perceived support for, and (3) anticipated outcomes of agricultural economists who engage in UR. Based on an online survey distributed to U.S. faculty, results provide a perspective of the motivations of research mentors to engage in UR, prevailing advising models, and objectives, and perceived positive externalities to the field of agricultural economics. Intrinsic and extrinsic motivations may play an important role in faculty willingness to provide UR opportunities. Additionally, institutional bodies can alleviate the difficulties researchers face when engaging undergraduates, thereby increasing the overall interest of faculty and students in agricultural and applied economics to engage in research.

1 Introduction

Numerous studies have documented the benefits of undergraduate research (UR) (Ahmad and Al-Thani 2022; Buchanan and Fisher 2022). For an undergraduate student, engagement in a well-defined research project helps to develop their critical thinking skills (Ishiyama 2002; Brownell et al. 2015), thereby promoting higher-order learning outcomes (Brownell and Kloser 2015), such as creating new knowledge (Byars-Winston et al. 2015). Engaging with a faculty member in research also has added benefits; for example, it improves the undergraduate's collaboration (Ruth, Brewis, and SturtzSreetharan 2021) and communication skills (Kilgo, Ezell Sheets and Pascarella 2015), and can increase student retention (Johnson and Knox 2022).

For the faculty member, benefits include improved quality of work, personal satisfaction (interpersonal gains), and contribution to the faculty's research agenda (Zydney et al. 2002; Adedokun et al. 2010). Faculty members with research activities, including those with research roles and responsibilities as part of their formal university appointments, can be more familiar with changes in their development (Marsh 2007) and, thus, could lead to opportunities for collaborative partnerships with undergraduates. Furthermore, an environment where a greater proportion of faculty members found UR to be of higher importance was linked to increased student participation in UR (Webber, Nelson Laird, and BrckaLorenz 2013). For the university, benefits can accrue in the form of increased visibility in the scientific community from publications, abstracts, and presentations (Petrella and Jung 2008). Beyond personal growth and potential career exploration, participating in UR can augment job readiness and productivity through enhanced skills in problem-solving, analytics, attention to detail, adaptability, and time management relative to some conventional classroom offerings. These skill-enhancing activities coincide well with evolving employer preferences for more problem-solving capabilities relative to traditional grades as job performance indicators (National Association of Colleges and Employers 2022).

Beyond industry-oriented career preparation, UR can also prepare students for graduate degree programs by developing research skills and gaining a stronger understanding of the research process. For example, students mentored toward overcoming the rigors of the peer-review process and successfully publishing an article in a journal demonstrates a high degree of commitment to the research process and their discipline. Students who participate in UR also have a stronger sense of self-confidence and independence (Laursen, Seymour and Hunter 2012). Students with scholarly writing or presentations are generally more desirable and more competitive candidates for limited funded research assistantships. Moreover, many top economics programs support participation in UR (Hoyt and McGoldrick 2017).

On the other hand, educators face competing priorities for limited time and resources which can (1) obscure the value of engaging in UR, or (2) they may not consider the UR engagement as well-supported at their institution or by colleagues. In the field of agricultural economics, most research has focused on the benefits of UR to the students (Bampasidou et al. 2016; Penn and Sandberg 2018). However, little is understood about faculty motivations to increasingly engage in UR within the agricultural and applied economics discipline. While UR is a “high-impact learning activity” (HIP) that benefits undergraduates, these activities require intense effort by both faculty members and students (Bampasidou et al. 2016). There is also a “fundamental tension” between producing publication-worthy research and student development (Laursen 2015). This begs the question of (1) what motivates faculty mentor UR and (2) how to increase engagement in UR engagement. To examine this issue, this study seeks to (1) increase understanding of the motivations, (2) assess perceived support for, and (3) anticipate expected outcomes of agricultural economists who engage in UR.

This commentary reports the survey results of a sample ($n = 48$) of agricultural economists to understand the motivations, perceived support for, and anticipated outcomes of agricultural economists who engage in UR. The survey was designed based on previous literature to assess multiple facets of faculty perspectives and attitudes, including their motivations for engaging undergraduates, barriers to success, and student outcomes. Preliminary findings suggest that there are numerous reasons why faculty perceive that they should engage in UR/HIP, but substantial barriers exist beyond the control of faculty members.

2 Methods

To understand mentors' attitudes and rationale for advising UR, a survey was conducted beginning in March 2022 through Fall 2022 via Qualtrics (see Appendix 1). A review of prior literature provided initial guidance on survey design on relevant factors among faculty of UR mentoring. As such some questions were created, based on the findings from past studies, related to research advisors' motivations, including intrinsic and extrinsic motivations (Hayward Laursen, and Thiry 2017), benefits and outcomes of UR (Hayward et al. 2017), and the diversity in types of UR relationships between student and faculty (Matthews et al. 2019; Morales, Grineski and Collins 2021). The survey underwent several rounds of revision based on feedback from undergraduates, graduate students, and faculty, both with and without UR advising experience. The University of Florida Institutional Review Board (IRB) reviewed and determined that the survey and associated outreach materials were exempt (IRB202200390). Participants were recruited through listed contact personnel by institutional administrators, such as college deans, department heads/chairs, and faculty members. Contact information from publicly listed university, college, or department directories was used, and those in the academic profession were encouraged to share information about the survey questionnaire/data collection effort with other faculty to increase faculty member participation in the study.

The survey instrument asked respondents about their demographic and institutional characteristics, their experiences in working with undergraduate students (both one-on-one and in-classroom settings), methods of engaging and recruiting student researchers, and the perceived benefits

of UR both to themselves and the students. Most questions relied on five-point Likert-type responses in terms of importance (“Not at all” to “Extremely”) and frequency (“Never” to “Always”). The statistical analysis relied on basic statistical tests for patterns in the data such as Fisher’s exact test and Wilcoxon sign-rank tests.

3 Results

Of the seventy-two survey responses collected, forty-eight were usable responses (67 percent) with the remainder removed due to incomplete responses (Table 1). Our sample represents mostly faculty from agribusiness and agricultural economics departments (71 percent) largely from medium-sized (eleven to thirty faculty) or large-sized (thirty-one to fifty faculty) departments (83 percent). Nearly all respondents (96 percent) have graduate programs with just under half of the sample having more than 250 students (43 percent). Almost all our sample has engaged in UR extensively (94 percent) with 71 percent engaging three or more undergraduates in one-on-one research and almost half in course-based research. Most respondents mentor UR in the fields of agribusiness economics and agricultural policy. There is a mix of research-dominated (39 percent) and teaching-dominated (34 percent) appointments. Most respondents perceived a low level of support at all levels, but especially at the association level which only 5 percent felt supported UR. The remaining results appear in three sections: factors impacting participation in UR, anticipated benefits and outcomes of UR, and limitations and barriers to engaging in UR.

3.1 Factors Impacting Participation in UR

We conducted a series of Fisher’s exact tests to determine which factors have codependences to UR engagement for one-on-one and course-based research (Table 2). Faculty size, appointment, and undergraduate program size were evaluated and found to be independent of, or unassociated with, UR advising. One reason is potential self-selection bias; faculty who care about UR were more likely to take the survey, regardless of their undergraduate enrollment. However, there is evidence of a relationship between perceived support with UR. Department, college, and university support activities have statistically significant relationships with UR advising.

3.2 Factors Affecting Decisions to Mentor Undergraduates

We measured factors affecting the decision to mentor a particular student. Faculty are foremost interested in the student’s talent, placing priority on the student’s motivation ($\mu = 4.6$, $\sigma = 0.58$) and intellectual curiosity and critical thinking ($\mu = 4.5$, $\sigma = 0.69$; 1 = not important at all, 5 = extremely important). Conversely, other factors like GPA, speaking skills, experience with statistical software, and the student coming from an underrepresented background all averaged between 2.3 and 3.0 (Figure 1).

3.3 Valuing UR Engagement

Faculty generally do not view UR as being valued (1 = not at all valued, 5 = very highly valued) at the discipline level (2.31), with only slightly more value being perceived from the department and college (2.75) or university (2.63). The respondents also indicated a lack of support at all these levels. Overall, 68 percent feel supported at the department and university level while 89 percent feel unsupported at the association level. It is worth noting, however, that regional and national associations do invest resources in activities, such as academic bowls, to support student engagement, pointing to a potential gap related to UR.

3.4 Benefits of Engaging in UR

When asked about the benefits of UR to the mentor, 90 percent selected personal fulfillment while approximately 48 percent mentioned an increase in research output. Mentors likely care more about the

Table 1: Descriptive Statistics of Survey Respondents (n = 48).

Variable	Frequency
<i>One-on-One Research</i>	
Less than 1	6%
1	10%
2	13%
3+	71%
<i>Course-Based Research</i>	
Less than 1	46%
1	4%
2	8%
3+	42%
<i>Faculty Size</i>	
Less than 10	15%
11–30	63%
31–50	21%
50+	2%
<i>Undergraduate Enrollment</i>	
Less than 50 Students	0%
51–150 Students	25%
151–250 Students	27%
251–350 Students	15%
350+ Students	29%
Not Sure	4%
<i>Majority Appointment</i>	
Extension	20%
Research	39%
Service/Administrative	7%
Teaching	34%
<i>Perceived Support</i>	
Department	15%
College	21%
University	19%
Association	5%

enrichment they experience in activities that support student development. Less important were professional advancement (15 percent) or networking benefits (19 percent). Statements such as “paying it forward,” “self-fulfillment,” “mentor experience,” and “advancing diversity of future researchers” all rated highly with mean scores of 3.4–3.7 (on a Likert scale of importance; Figure 2). Tangible outputs such as research or Extension publications were both relatively unimportant (2.0), though faculty do believe that a poster/presentation (2.4) and recruiting (3.3) are more important factors.

Table 2: Results of Fisher’s Exact Tests

Variable	p value
<i>Departmental Characteristics</i>	
Faculty Size x One-on-One UR	0.796
Faculty Size x Course-Based UR	0.932
Undergraduate Enrollment x UR	0.088
<i>Faculty Appointment</i>	
Extension Appointment x UR	0.726
Research Appointment x UR	1.000
Service/Admin Appointment x UR	0.684
Teaching Appointment x UR	0.215
<i>Respondent’s Perceived Support</i>	
Departmental Support x UR	0.075
College Support x UR	0.009
University Support x UR	0.036
Association Support x UR	0.681

Note: n = 48, UR: Undergraduate Research

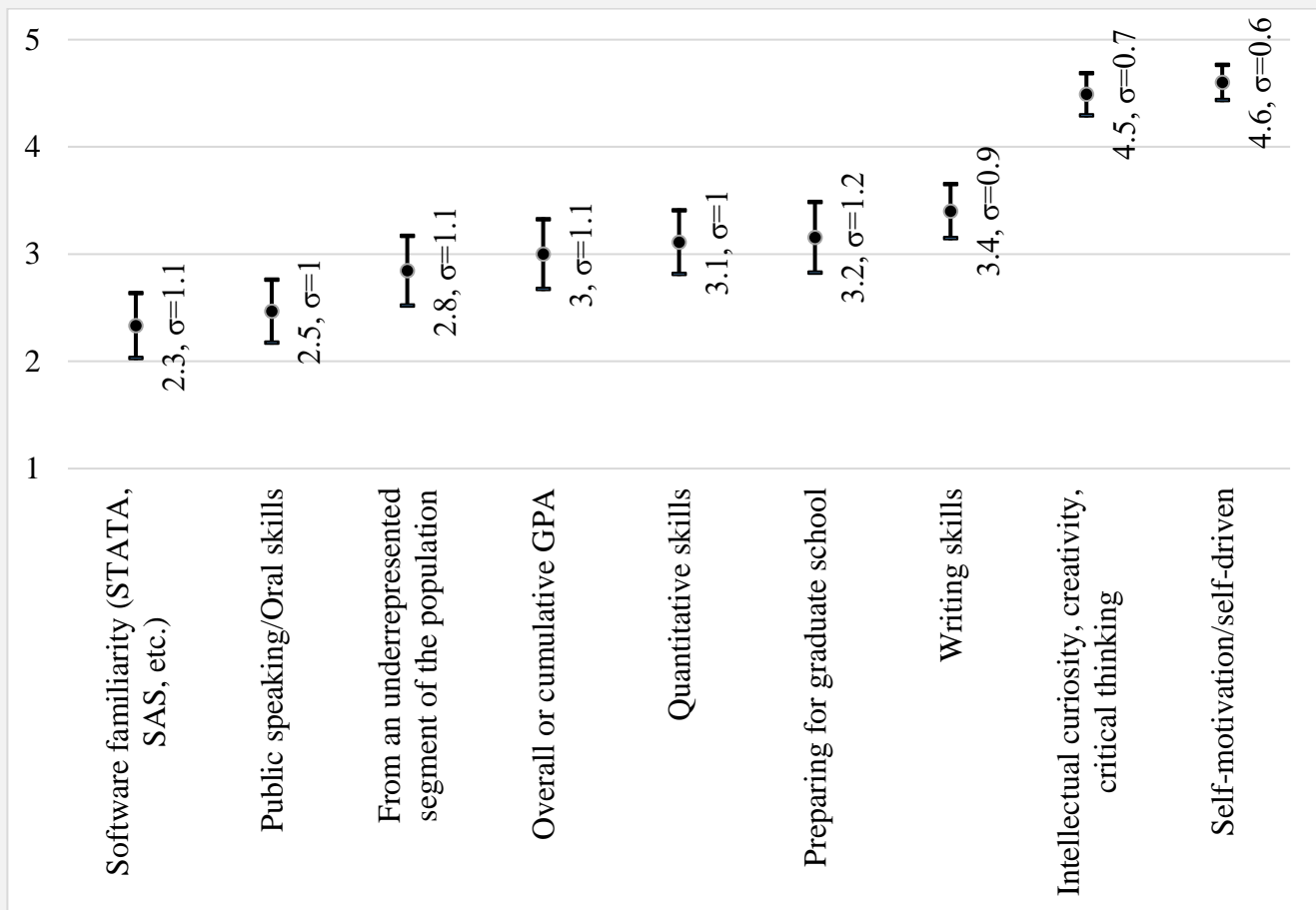


Figure 1: Average Importance Rating on Student Characteristics with 95% Confidence Intervals (1 = Not at All Important to 5 = Extremely Important)



Figure 2: Average Importance Rating on Mentor Motivations with 95% Confidence Intervals (1 = Not at All Important to 5 = Extremely Important)

In terms of frequency of UR outcomes (1 = not at all, 5 = almost always), the most common are research presentations (3.2) and graduate school (3.1). Less common are formal writeups such as research articles (2.2), Extension articles (2.2), or news articles (2.1), all about equal frequency. Beyond formal output, faculty tend to agree (1 = strongly disagree, 5 = strongly agree) that students often gain intangible skills and soft skills such as thinking and working like a researcher, graduate school preparation, confidence/comfort doing research, analytical/communication skills, and career clarification (all between 4.2 and 4.4).

Surveyed faculty frequently worked with women (71 percent), first-generation students (46 percent), and minority students (40 percent). Surprisingly, very few (23 percent) of the undergraduates engaged in UR in the past three years went on to an economics graduate program. Most commonly, students went into industry (42 percent), though many were uncertain of their students' outcomes (20 percent). This indicates that perhaps one benefit of UR is that we are engaging a different subset of students than documented by previous studies and again points to another area of inquiry in this research area. These other areas could help shed more light on the rationales behind attracting women, first-generation students, and minority students along with their attitudes toward graduate degrees.

3.5 Factors Limiting Engaging in UR

Previous studies demonstrate several factors may limit faculty willingness to engage in UR (Morales, Grineski, and Collins 2017; Morales et al. 2021). On a Likert scale with 1 = never and 5 = always, no limitations were selected to limit engagement most or all of the time on average. Lack of student interest (2.8), time required (2.6), and lack of recognition in the tenure and promotion process (2.5) were the most limiting factors (Figure 3). Faculty interest (1.9) and appointment (1.3) were the least restrictive. Overall, these results indicate that none of the factors identified by previous studies change willingness to participate in UR; however, most of our respondents indicated a high degree of involvement in UR, unlike those who did not participate in the survey or who do not regularly engage in UR.

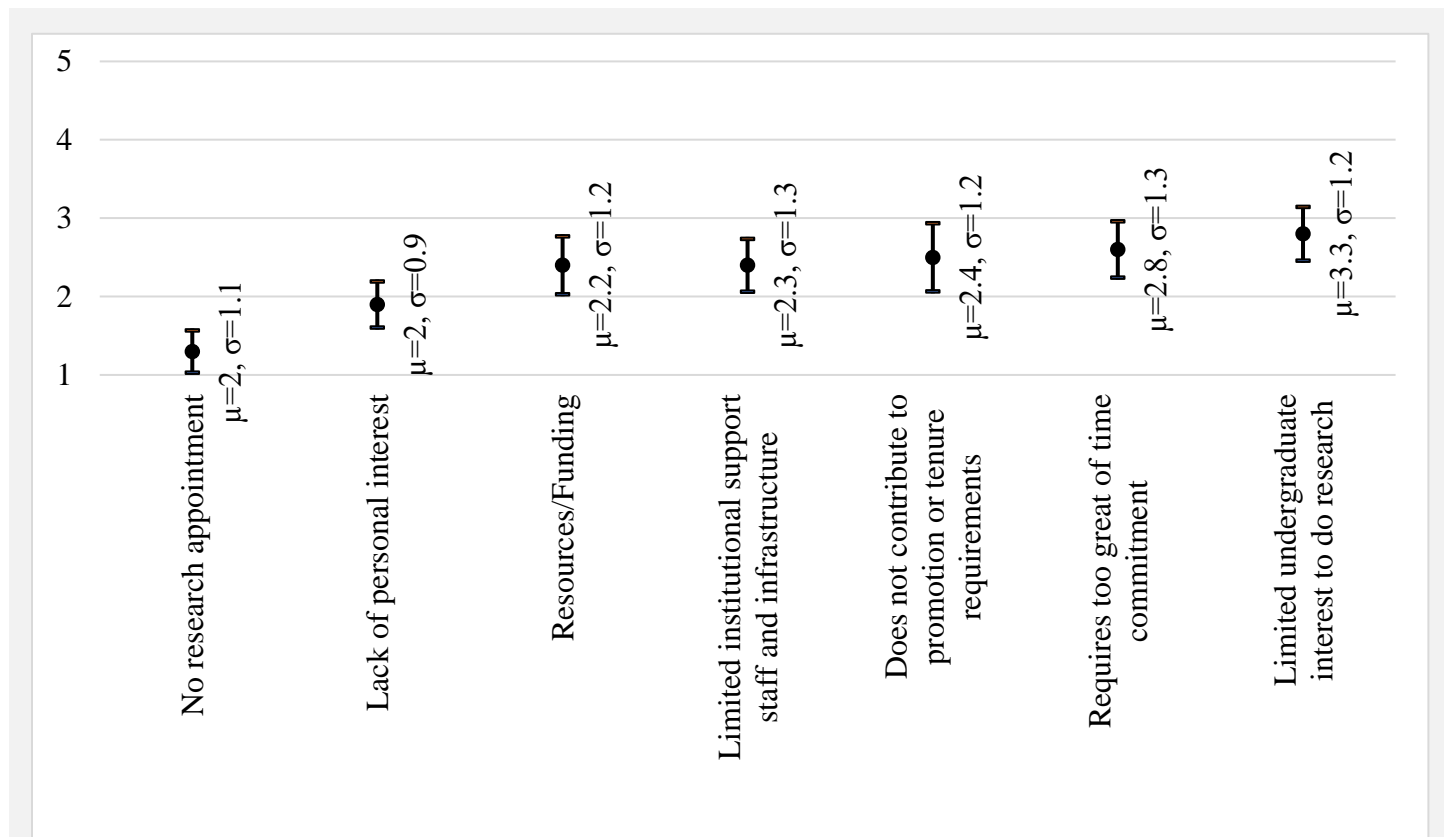


Figure 3: Perceived Rating of How Often Challenges or Disadvantages Limit Undergraduate Research (UR) Engagement with 95% Confidence Intervals (1 = Never to 5 = Always)

4 Discussion

The key messages from this survey sample are that faculty members in agricultural economics are more likely to engage in UR because of intrinsic motivations, but there is also a desire for more recognition and more resources dedicated to UR. Other disciplines have observed similar patterns of intrinsic motivation for participation and interest, including diversity (Morales et al. 2017; Hayward et al. 2017). Our enthusiastic sample is not hesitant to work with undergraduate students, though opportunities for increased engagement exist. Coupling both the many duties and responsibilities required of faculty members with the perceived low value of UR can put downward pressure on prioritizing UR engagement opportunities with students despite their intrinsic motivations. In summary, the limiting factors are limited funding resources, institutional support, and time as well as minimal undergraduate interest in research. Overall, these match similar themes from previous literature of predominant challenges to UR (Lunsford et al. 2013; Jones and Davis 2014), though differences exist. For example, Laursen et al. (2012)

show that limited resources are a relatively minor challenge to UR. Further, whereas limited time is often among the most important challenges (Adedokun et al. 2010; Thiry et al. 2012), limited student interest was equally important in agricultural economics. This may be field-specific since the vast majority of students are planning for a career in industry and may not see research as a complementary experience toward this end. If so, it may be useful to shift how research is marketed to students to convey the pertinence of skills gained.

4.1 Limitations

Several constraints may impact the generalizability and interpretation of our findings. First, the sample size and composition, though adequate for preliminary insights into a growing area of interest, do not encompass the full diversity of agricultural economists in the United States, which may limit the applicability of our results to all settings and contexts within the field. This is demonstrated by the preponderance of responding faculty who primarily work in agricultural marketing and policy, whereas the discipline has a large number of other sub-fields. We also recognize that the rapidly evolving landscape of agricultural economics and higher education may affect the relevance of our findings over time. Despite these limitations, this study contributes valuable preliminary insights and serves as a foundation for future research aimed at addressing gaps and extending our understanding of UR engagement in agricultural economics.

4.2 Recommendations and Future Research

Our field has an opportunity to increase engagement in UR in early career stages of faculty. Through institutional partnerships (such as the Economic Research Service cooperative agreements) and non-profit association trusts (such as the AAEA Trust, see: <https://www.aaea.org/trust>), students in agricultural and applied economics fields are receiving growing financial support. However, resources and support should also be directed toward advisors and foster the relationship between undergraduate mentees and faculty mentors. One starting point could simply be recognition of UR and including both the advisor's name and affiliation alongside the student. Organizational structures (such as departments, colleges, universities, and associations) can also play a significant role in abating these issues and provide pathways to obtaining the benefits of UR. For example, associations excel at fostering networking and development opportunities, and can do so for undergraduates (Agricultural and Applied Economics Association 2023). Levels of support can vary from more minimal approaches such as short courses on data collection platforms (such as Google forms or Qualtrics) or providing administrative assistance (such as gaining IRB approvals and editorial services), to more substantial interventions such as faculty time buyout or summer pay and/or paid summer research internships for students matched with faculty.

5 Conclusions

Overall, more research and a larger sample are needed to adequately generalize the thoughts of agricultural economists on engaging undergraduate students in research. In the interim, a broader discussion is needed at all levels to provide greater focus and guidance on the importance of mentor-guided research as an avenue of training and development of students. Moreover, an assessment of the perceived needs and benefits of undergraduates should be coupled with these discussions to ensure that there is a viable pool of students who want to engage in this practice going forward.

About the Authors: John Lai is an Assistant Professor at the University of Florida (Corresponding author email: johnlai@ufl.edu). Jerrod Penn is an Associate Professor at Louisiana State University and Louisiana Agricultural Center. Misti Sharp is an Instructional Associate Professor at the University of Florida.

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