

Student Pre-University Experiences Toward Commitment to Agriculture



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Abstract

University agricultural programs' struggle to attract students is leading to a disparity in the number of available jobs in agriculture and the number of qualified applicants to fill these positions. This study sought to garner a unique students' perspective of ways that universities and specifically agricultural programs can support and encourage them to commit to agricultural degree programs by understanding potential pre-university experiences that influence their decision to commit to agriculture long-term. We reported our findings based on 22 responses from students in two different U.S. universities who filled out the open-ended questionnaire. From the responses, we found that before entering university, students' farming-related activities and participation in school-based agriculture-related and research programs impacted their future commitment to agricultural degree programs. Moreover, scholarships, practical experience opportunities, and course-related actions at the university level also impacted students' commitment to agricultural degree programs. We recommend continued research into students' commitment to a career in agriculture. Additionally, expanding primary and secondary school agricultural education programs and K-12 students' participation in 4-H and FFA programs

may increase their exposure to agricultural experiences. Providing greater financial assistance and university support to students in agriculture programs may also positively impact students' commitment to agriculture long-term.

Keywords: student commitment, agriculture, pre-university, career selection

In recent years there has been a significant disparity between the number of available jobs in the agriculture sector and the number of students enrolled in undergraduate agricultural programs in the United States (Fernandez et al., 2020; Goecker et al., 2015). Universities, and in particular, Colleges of Agriculture, must find ways to increase student commitment to agriculture to meet the needs of the field. Undergraduate agriculture students represent an important source of qualified applicants and workers, yet the number of students in agricultural programs has declined as recently as 2020 (Data USA, n.d.). Changing demographics and a population shift to urban and suburban areas have significantly increased the number of "non-traditional" agricultural students, primarily characterized as non-rural, non-white, and without a background in agriculture or

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participation in formal agricultural-related programs like FFA and school-based agricultural education (SBAE) (Esters, 2007; Rickard et al., 2017; Smith-Hollins, 2015).

Given the long-term nature of this issue, many researchers have examined different factors that impact students' decision-making related to enrolling and continuing in agriculture degree programs. Studies (e.g., McKim et al., 2017; Riegle-Crumb et al., 2020) have highlighted the importance of student experiences in their degree programs, including positive interactions with peers, faculty, and staff impacting students' connection to their degree programs. These studies discuss challenges faced by especially non-traditional agriculture students due to potentially absent support structures. Arguably, however, the importance of university factors is secondary to getting students to pursue agriculture. The recruitment of both traditional and non-traditional students by colleges of agriculture is well studied; however, only a few studies take a qualitative approach, directly encouraging students to reflect on their own influential experiences in agriculture before enrolling in university. There is also a lack of studies that examine students' pre-university experiences that influenced their decision to pursue a degree and career in agriculture. Therefore, this study examines unique students' perspectives of how universities and specifically agricultural programs can support and encourage them to commit to agricultural degree programs by understanding potential pre-university experiences that influence their long-term decision to commit to agriculture.

Purpose and Objectives

1. Describe what factors impacted students' commitment to agriculture prior to entering university.
2. Describe how the university can support and encourage students to commit to agricultural degree programs.

Methods

The current study is a follow-up study of a more comprehensive study of students' commitment to a career in agriculture that we conducted in 2021. In the comprehensive study, we examined the influence of emotional support, academic support, relevant skill acquisition, and family influence on student's commitment to a career in agriculture. None of those factors was related to students' commitment to a career in agriculture. However, in that study, we did find that student hometown and annual family income inform student commitment to a career in agriculture. Based on the results of that study, we decided to conduct a qualitative analysis and explore other factors that may affect students' commitment to a career in agriculture.

In the current study, we investigated other factors that can influence students' commitment. The study was deemed exempt by the Pennsylvania State University Institutional Review Board; however, all participants were still provided written informed consent prior to participation. The study was conducted in Pennsylvania and Hawaii. We

used a convenience sampling approach. Therefore, caution should be taken when attempting to generalize the study's findings beyond the study population. The target population for the study was undergraduates in their third year or higher at the two universities. Of the 308 eligible students contacted through the departmental listserv, 34 indicated their willingness to participate, and all 34 were sent the questionnaire. Of the 34, there were 22 complete responses (13 from The Pennsylvania State University and 9 from the University of Hawaii at Manoa), with a response rate of 64.7%. The demographic information for the participating students is shown in Table 1.

Study participants were asked two (2) questions to 1) better understand the factors and experiences prior to attending a university that impacted students' long-term commitment to agriculture and 2) identify potential ways that the university can better support and encourage students to commit to agriculture degree programs and careers other than those mentioned in the survey. We collected data via the Qualtrics platform. We sent an invitation email to our target audience and asked them to participate in a voluntary qualitative study. We followed Dillman et al. (2014) approach during the data collection procedure.

We utilized NVivo software for data analysis. In NVivo, we separated the responses for each question and used a conventional content approach to sort and analyze the data. As described in Hsieh and Shannon (2005), the conventional content analysis approach does not involve confirming a researcher's expected patterns or themes within the data. Conventional content analysis allows for the development of categories and the recognition of patterns based on the data. Conventional content analysis is simple but can be effective in summarizing thoughts, though not as effective in tying findings to existing theory or fully understanding potential variation due to the context of the study. However, based on the exploratory nature of the current study, we determined this type of analysis to be sufficient and effective in describing the perceptions and experiences of the study participants.

To conduct the content analysis for question 1, "*What experiences prior to college have led to your commitment to continuing in the field of agriculture? Please describe.*" we applied an initial query to identify common words and phrases within the data set. Some examples of commonly used keywords/phrases for question 1 included "farm," "school-based," "agriculture," and "environment." Following this, we sorted similar phrases into categories to classify participant experiences. This process resulted in three categories of experience: farm-related experience, school-based agricultural education, and research programs and internships.

The same procedure was used to analyze participant responses to question 2, "*What, if anything, do you think the university could do to encourage or support students to continue in agriculture degree programs?*" we applied a query to identify common keywords and phrases within the responses. Then, we sorted similar phrases into categories to classify participant suggestions. The analysis yielded three specific categories of suggestions: scholarships, practical experience opportunities, and course-related

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Table 1.

Descriptive Statistics of Study Demographic Variables

Item	<i>n</i>	%
Institution		
The Pennsylvania State University	13	59.1
University of Hawaii at Manoa	9	40.9
Gender		
Woman	15	68.2
Man	7	31.8
Ethnic/Racial Background		
White	14	63.6
Asian	5	22.7
Native Hawaiian/Pacific Islander	2	9.1
Biracial	1	4.5
Highest Level of Education Completed by Parent/Guardian/Parental Figure		
High school diploma	2	9.1
Some college	2	9.1
Associate's degree	1	4.5
Bachelor's degree	11	50.0
Master's degree	4	18.2
Doctoral degree, medical degree, law degree	2	9.1
Number of people currently living in the household		
1-2	3	13.6
3-4	17	77.3
7-8	2	9.1
Annual Household Income		
\$26,501 - \$39,750	2	9.1
\$39,751 - \$79,500	6	27.3
\$79,501 - \$159,000	6	27.3
Greater than \$159,000	6	27.3
Location of Hometown		
Rural Area (less than 2,500 people)	13	22.7
Small Town (2,500 – 25,000 people)	19	40.9
Large Town (25,000 – 100,000 people)	14	27.3
Midsize City (100,000 – 250,000 people)	1	4.5
Large City (more than 250,000 people)	1	4.5

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Table 1 Cont.

Descriptive Statistics of Study Demographic Variables

Item	n	%
Location of Future Career		
Rural Area (less than 2,500 people)	5	22.7
Small Town (2,500 – 25,000 people)	5	22.7
Large Town (25,000 – 100,000 people)	4	18.2
Midsize City (100,000 – 250,000 people)	3	14.3
Large City (more than 250,000 people)	4	19.0

actions. Participants also identified more advertisements, information, and outreach as general suggestions for university agriculture programs.

After identifying the categories, we calculated the frequency of each response type for both questions and reported this along with specific participant responses. For individuals whose responses placed them in more than one category (e.g., scholarships and practical experience opportunities), we counted them in the data analysis for all applicable categories. We did this to provide an accurate account of meaningful experiences and a better reflection of the suggestions and opinions of the participants.

Results

Research Objective 1

Research objective 1 was to describe what factors before entering university impacted students' commitment to agriculture. Findings identified three types of experiences: 1) farming-related activities, 2) school-based agriculture-related programs, and 3) research programs and internships. Below are the descriptions of the participant's written responses to the question, "What experiences prior to college have led to your commitment to continuing in the field of agriculture? Please describe." Common phrases and specific responses are quoted to provide further information and context.

Farming Related Activities

Forty-one percent of participants (n = 9) indicated that prior experiences related to farming and community development were key factors that contributed to their commitment to agriculture. Respondents identified farm experience as a key factor, discussing growing up and working on the family farm. Respondents also explicitly mentioned that "volunteering" and "community" work played significant roles in their commitment to agriculture, with one student saying, "I began volunteering at a taro farm and eventually working at one just because I loved the work" (P8). Other students identified local community projects, with one respondent saying, "I have always loved food, and conducted a small composting project in the housing complex where I live" (P17). Another student mentioned, "I volunteered for community service projects around my area

from home that involved helping build up farms" (P16).

School-Based Agricultural Education

Forty-one percent of participants (n = 9) indicated that participation in school-based agriculture-related programs was a key factor that contributed to their commitment to agriculture. Phrases used included "FFA" and "school." Many students identified school-based agricultural education generally as a key to their commitment to agriculture. Within school-based agricultural education, several students specifically identified participation in the Future Farmers of America (FFA) as a major factor in their commitment to agriculture, "Participation in high school FFA, highly participated for three years." (P5). Others mentioned participating in school programs and projects related to agriculture and natural resources.

Research Programs and Internships

Fourteen percent of participants (n = 3) indicated that participating in agriculture and environmental science research programs and internships before college was a key factor in their commitment to agriculture. One participant mentioned their interest in agriculturally related research developed with "a childhood immersion in nature and environmental summer camps that instilled in me respect for the earth and its inhabitants" (P20). Another participant mentioned their participation in several programs, including the "World Food Prize, PSEAS [Pennsylvania School for Excellence in the Agricultural Sciences], Kenya International Livestock Research Center Internship" (P22).

Research Objective 2

Research objective 2 was to describe how the university can support and encourage students to commit to agricultural degree programs. Findings identified three categories of potential university actions, scholarships, practical experience opportunities, and course-related actions. Additionally, participating students indicated that general information was necessary for universities to encourage and support students in agriculture, whether related to opportunities or toward advertising the field of study. Below are the participants' responses to the question, "What, if anything, do you think the university could do to encourage or support students to continue

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in agriculture degree programs?” Common phrases and specific responses are quoted to provide further information and context.

Scholarships

Over half of the participants (55%, $n = 12$) indicated that scholarships are an important action the university can take to encourage and support student commitment to agriculture. Participants mentioned that scholarships could provide *“a great incentive”* (P14) and *“would help students get excited about agriculture and the importance of the study”* (P21).

Practical Experience Opportunities

Twenty-seven percent of participants ($n = 6$) indicated that the opportunity to get practical training and experience in agriculture is an action the university can take to encourage and support student commitment to agriculture. Many of these participants specifically identified the importance of study abroad programs discussing the importance of these programs toward student engagement. One participant said,

I think more study abroad options in agriculture and food systems would be really exciting, because I know myself and my friends are always looking for practical ways to apply the knowledge we learn in the classroom. These opportunities can also get students excited to stay engaged in their classes if that knowledge will be used in the upcoming program (P19).

Other participants highlighted the need for more opportunities to connect with industry and potential employers in agriculture. Specifically, one student mentioned, *“I think to increase students in agricultural degree programs, it is important to exhibit those agricultural jobs are a viable option and that [there] are career paths following getting a degree”* (P14).

Course-Related Activities

Twenty-three percent of participants ($n = 5$) indicated that changes to university programs and course structures would be ways the university could encourage and support student commitment to agriculture. Students highlighted the importance of engaging and relevant coursework, with one participant saying that universities should *“provide more courses year-round (not just during certain semesters) that provide the training and dynamic courses to spark interest and dig deeper”* (P20). Others had more specific suggestions, with one saying, *“making sure that most if not all classes have a sustainability angle will be important for attracting more students who are interested in conservation”* (P19). Participants also described potential course-related opportunities. For example,

I think the university could show their support for agriculture [by] starting a campus farm that could supply some food to the dining hall... Ag classes will also be much more successful if they [students] are doing the work rather than just reading about it (P8).

Other University Actions

Aside from the three main categories, the overall need for advertisement and information about agriculture programs toward encouraging and supporting student commitment to agriculture was identified. Participants identified *“outreach”* and *“advocation”* as being important toward attracting more students. This perception is reinforced in the responses, with one participant remarking,

I have never heard of most of the agricultural degree programs at my school until I went through a list of every degree program and read about each one. Getting information about these degree programs out could really catch a lot of students eyes (P4).

Discussion

This study makes an essential contribution to the research in the field of agricultural education by incorporating student perspectives and testimony when examining the pre-university factors that impact student commitment to agriculture. In getting student testimonials, the results of this study provide a nuanced, contextualized sense of what university agricultural programs and the agricultural field should consider toward addressing existing issues with long-term student commitment.

Pre-Institutional Factors Affecting Student Commitment to a Career in Agriculture

Previous studies have examined pre-institutional factors related to agricultural degree program selection and career commitment (e.g., Alston et al., 2019; Rayfield et al., 2013; Smith-Hollins et al., 2015; Velez et al., 2018; Wildman & Torres, 2001, 2002). These studies identified exposure to agriculture through farming experience, school-based agriculture education, and familial employment in the field as important factors in student pursuit of and commitment to the field of agriculture. The findings of this study support previous studies. We found that students identified specific experiences such as working on a farm, participating in school-based agriculture education in high school, and taking on agriculture and natural resource-related internships and research projects as strongly impacting their commitment to agriculture. The factors identified by students in the open-ended responses suggest that prior exposure to agriculture before attending university affected their commitment to agriculture as a field.

In the initial companion study examining university support and commitment, we found that emotional support, academic support, and relevant skills acquisition do not significantly impact student commitment to a future career in agriculture. Prior exposure and experience in agriculture could have impacted these students' actions during their degree program (e.g., seeking academic or emotional support, exploring research opportunities, and interacting with faculty and peers). Individuals who did not have prior exposure to agriculture would potentially have a different experience within their degree program and have different needs than those with prior exposure and experience.

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Recruitment in Agriculture Degree Programs

Additionally, there is a significant body of literature examining strategies and best practices for recruiting students to agricultural degree programs and careers (e.g., Alston et al., 2019; Baker et al., 2013; McGovney-Ingram et al., 2011; Rayfield et al., 2013; Smith-Hollins et al., 2015; Stair et al., 2016; Wildman & Torres, 2001, 2002). This study adds to existing literature through additional direct suggestions from current agriculture students. The most common suggestion from participants was an increase in scholarship and funding opportunities for students in agriculture. This finding follows the literature examining agricultural and non-agricultural programs (e.g., Rayfield et al., 2013; Stair et al., 2016). The rising costs of higher education have resulted in students looking at degree programs both in the short term (cost of the degree program) and long term (job and career prospects) (Myers et al., 2004). Specifically, Wildman and Torres (2002) found that students in agriculture identified financial costs as one of the primary considerations when choosing their field of study. Another common suggestion from study participants was practical experience opportunities through internships, research studies, and study abroad programs. Participants highlighted the desire for industry connection and practical application of learned material in agricultural courses. The need for applicability and connection with the learned material is long supported in the literature, with Smith (1989) mentioning surveyed undergraduate students' desire for greater applicability within the curriculum and stronger connection of the course material with future career needs.

Recommendations for Practice

Overall, many participants in this study expressed the need for more information about agriculture related to the types of programs in colleges of agriculture, scholarship and other funding opportunities, job and career prospects, and general information about agriculture as a field and the importance of agriculture in society. Baker et al. (2013) focused on how best to provide this information to prospective students in agriculture. The authors found that students wanted easily accessible materials through multiple channels (social media, web videos, seminar classes, and campus publications). Additionally, with specific topics such as job/career prospects, participants highlighted hearing about jobs and careers in agriculture from people currently in the field. The results of this study and those described in Baker et al. (2013) suggest that attracting and encouraging students to pursue agriculture requires identifying important resources for students and the most effective mechanisms to make students aware of desired information and resources.

Study results also suggest that other agriculturally related experiences before entering university impact students' decision to commit to agriculture as a career. Students highlighted farming, community development projects, natural resource internships and research programs as meaningful experiences that led to their commitment to a career in agriculture. School-based agricultural education classes and programs provide middle

and high school students with experienced professionals to introduce and generate student interest in agriculture. Currently, agricultural education is not standard in public schools. In a 2018 national survey of high school science teachers, only one-fifth were teaching agricultural science in their lessons (Bayer & National 4-H Council, 2018).

Similarly, programs like 4-H and FFA increase student exposure to different aspects of agriculture and practical agricultural experiences, with 4-H participation starting at five (5) years old (4-H, n.d.). However, there is a noticeable lack of diversity and inclusion in both these organizations (Lerner & Lerner, 2013; National FFA Organization, 2021) and low participation among students of minority and low socioeconomic status (SES) groups due to a lack of representation within the organization. Investment and resources should be made to increase minority volunteer and staff representation at the organizational level. Additionally, providing appropriate and targeted funding and assistance for minority and low-SES families and developing accessible material should be used to generate program interest among parents and students.

Lastly, it was also apparent that finances were a vital consideration for many students when considering studying agriculture at the university. Many students indicated that scholarships were the best way for universities to encourage and support students in agriculture. This would suggest that universities should consider providing greater financial assistance and support to students in agriculture. It may also be in the industry's best interest to encourage more students to pursue agriculture at the university by providing financial assistance through scholarships and grants.

Recommendations for Research

The results of our study suggest that prior exposure to agriculture was an important factor in students' commitment to the field. Because of this, future research could examine the potential interaction between student exposure to agriculture prior to the university and the impact of university support structures on student commitment to a future career in agriculture. Examining potential interaction effects could provide further insight into the importance of exposure to agriculture prior to the university and result in programmatic changes in agricultural student recruitment.

Several studies (e.g., Martin & Kitchel, 2014; Scott & LaVergne, 2004; Talbert & Balschweid, 2004) have examined the barriers different groups of students face in participating in agricultural education programs, both school-based and community-based. Based on the current study results, there are issues in how current information about agriculture and agriculture opportunities is provided to students and their families. Participants in our study mentioned that they had not received enough information about agriculture as a field or opportunities within agriculture. Future research should explore how information about agriculture is distributed and advertised to students and families to provide valuable information for school and community agriculture programs regarding student recruitment.

Summary

This study explored the impacts of pre-university exposure and experience on agricultural students commitment to a future career in the field. The study results suggest the need for targeted programs to expose students to agricultural concepts and potential opportunities within agriculture before they enter the university. Once students decide to enroll, agricultural programs must provide financial support in the form of scholarships and grants to encourage students to commit to their degree programs. Additionally, universities should examine and consider the relevance and applicability of course material to ensure they prepare students for a future career in agriculture. Finally, there is a need for further collaboration between the university and industry to create opportunities for students to build and develop professional connections within agriculture.

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