

Factors Affecting Career Choices of College Students
Enrolled in Agriculture

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the Master of Science in Agriculture
and Natural Resources Degree

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Darren Fizer
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Abstract

Choosing the right career path is becoming more and more important for young students today. Students have to take into account many things when choosing a career and college major. Many factors can influence a student's decision, including parents, coaches, religious figures, or any role models in a student's life. Participation in agriculture clubs such as FFA and 4-H can also have an effect on students' career choices.

The objectives of this research study were to determine what factors affect agriculture students' choice of career path. A questionnaire was developed to examine areas of interest and attributes that may have influenced students when choosing a career path. The questionnaire was completed by 128 students in the freshman studies classes of The University of Tennessee at Martin who plan to major in Agriculture. Chi-square tests were used to examine relationships among study factors.

According to this survey, students are most influenced by family when choosing a major; 22% chose family as the most important factor influencing their choice of major. However, 21% of the students chose "a career that is personally rewarding" and 20% chose "FFA/4-H experience" as the most important factors affecting their choice. FFA played a bigger role in choosing a major than 4-H. Farming background and the size of schools did not play a role in choosing a major. However, students with a farming background were more likely to plan on working in production agriculture than students without a farm background. The students who completed the questionnaire had a positive outlook on their career. Students believe their projected careers will make a positive impact on the world. Students also believe that there are excellent career opportunities in agriculture.

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Chapter 1: Introduction

College students choose their job fields for many reasons. The factors that affect this decision include family, passion, salary, and past experiences. In addition to these factors, race and gender can also affect what field a student may choose. Some professions have greater percentages of a certain gender or race. Another thing that plays a big role in a student's decision of what field to study is the people or role models in his or her life. These role models can include a parent, teacher, or a recent employer.

When students are choosing a career, they may not have all the information about the job they are pursuing. The job may involve more math or science than students are prepared to study. Students may like one aspect of a certain job and not understand what other aspects come with that profession. For example some students may want to be veterinarians because they enjoy being around animals, but students may not realize how much school work is required to become a veterinarian. Also, students may not be open to all jobs in their area of interest.

Over time, certain job fields have peaked in numbers versus other job fields; this can form a pattern. Tools that can help students in their decision for certain career paths include career fairs, job shadowing, or internships. These tools can expose students to more career fields or areas within a certain field that a student did not know about.

Choosing a career path is a huge part of a young man or woman's life. The career path students choose will affect how they will live the rest of their life. A lot of students go through college without knowing what career path they want. Before students can pick a career path they need to experience what that career is like and what it involves.

There are many careers in agriculture from which students may choose. There are great opportunities for advancement and job placement in the agricultural field (Thiesse, 2012). Careers in the agricultural field include extension agents, crop production services, and agricultural communications.

Research Objectives

This research study was developed to examine factors that affect agriculture students when choosing a college major and career.

1) The first objective of this research project was to determine if FFA or 4-H influenced students when choosing a major. Students who join FFA or 4-H want to get more involved in agriculture. These organizations show students the many opportunities that agriculture has to offer, such as teaching students where food comes from and how it is processed, or gaining an understanding of the growing economy and how it affects agriculture. Students in 4-H or FFA are able to compete against other students in competitions such as soil judging, livestock showing, public speaking, and meat judging.

2) The second objective of this research project was to determine students' perceptions of the relationship of classes and skills needed to be successful in a career. Students often underestimate the importance of job skills and classes that are involved in career paths. For example, customer service can be underrated by some students when starting out. However, customer service is vital to every business in the nation and can contribute to the success or failure of a business.

3) Thirdly, this research project examined factors that most influence students when choosing a major or a career. There are many factors that have an influence on students today, including family, friends, and mentors. Students may also choose careers because they are personally

rewarding, there is a growing need for jobs in a certain job field, or there is potential for a great income.

4) The fourth objective of this research paper was to determine if the size of a student's school plays a role in choosing a major or career. Larger high schools have more programs and clubs to offer than others, giving students more opportunities. Smaller schools are often located in more rural areas, which may lead students to an agricultural career path or major.

5) The fifth objective of this research paper was to determine if growing up on a farm played a factor in choosing a major. Many students who grow up on a farm want to go into an agricultural career, whether they go back to farming or find a job in a different area of agriculture. Growing up on a farm may also have a negative effect on students. Students may dislike farm life and choose a different career path.

6) Finally, the last objective of this research paper was to determine whether students plan to work in the field of study in which they have majored. There is always a group of students who major in a certain degree area and end up on another career path. Students may not know exactly what career path to follow, and they may not decide on a career until they enter the workforce. For example, a student with a degree in agribusiness may find a passion for teaching after graduation.

Chapter 2: Literature Review

History

There are many events in history that changed the career field for men and women. Wages, employment rates, and the overall workforce have been affected over time. Events in history such as the Industrial Revolution and the Great Depression shifted factors in the workforce. The growth of the United States also affected the job market.

The Industrial Revolution led to an increase in the economy of the United States. The Industrial Revolution improved lifestyles by the increasing number of products being made in factories. People learned how to live better lives at home with the products that were being made (The Economist, 2013).

The Stock Market Crash of 1929 was caused by over-inflation of the stock market, which led to a steep decline (Kaymakci, 2012). The crash led to one of the country's biggest economic crises called the Great Depression. This resulted in had one of the highest unemployment rates in America's history (Fraser, 2010).

Recent Decades

Over the past decades, the careers for both women and men have changed. Today, jobs are more diverse and many jobs have shifted from one area to another. Over time, the culture and the economy have changed.

In the 1970's, many women entered the workforce. At the same time, people of different races were also merging into the job market, crossing lines that have never been crossed before (Maclean, 1999). For men during this time period, it meant that they had to compete with women for the same jobs.

In the 1980's, technology was on the rise with computers and other electronic equipment providing faster technology (Chimerine, 1996). This opened up more job opportunities for men and women who had the skill set to work with computers. Technology also changed the way employees worked in America. Computers changed how files were stored, how information was kept, and also sped up the process of work all together.

In the 1990's, the United States was coming out of recession and job growth for high paying groups grew faster than lower paying groups (Ilg and Haugen, 2000). Earnings in real estate, insurance, and services increased more than other industries. Blue collar occupations had a higher increase in employment than any other employment sector in this decade (Ilg and Haugen, 2000).

Over time the job market has seen many changes. Economic growth, improvement in technology, demographic shifts, and changes in consumer taste have all affected employment both positively and negatively. Both the number of jobs and the type of jobs that are available have been affected. As our country evolves and grows, our job fields will continue to grow and change (Su, 2004).

The economy is one of the fundamental parts of the job market (Blair, 1999). Economic growth leads to higher employment rates and increased spending. The growth of business leads to possible expansions, which create more job opportunities in the workforce. A growth in the economy of some fields can attract students to those fields.

Technology has changed the way people work in America. The growth in technology has made production faster and increased the amount of work that is done (Leicht, 2002). These changes in technology can have both a positive and negative effect in the workforce.

Popular Career and Major Fields

There are many majors and career paths available to students. The top five college majors are business administration and management, psychology, nursing, biology and education (The Princeton Review, 2013). Statistics show that agriculture is not the most popular major field; however, agricultural economics and agricultural production are among the top ten majors with the highest employment rate (98%) in the United States (Business Insider, 2013).

Careers in Agriculture

The job market for agriculture has expanded into a wide range of fields. Students who choose a field in agriculture can choose from a variety of careers including animal science, plant science, soil science, agricultural business, and agricultural engineering.

In the past, students who had an interest in agriculture went home to work on the family farm after graduating from high school or college. Some students even went on to start a small farm with the idea of expanding. There was less variety among jobs in the agricultural field in the past compared to present day agriculture (Thiesse, 2012). Farming in the past was more out of necessity than source of income. Farm families were often large to support the labor needs of the farm (Steadman, 2000).

Today, agriculture is more advanced and the job field has expanded opportunities for graduating students. Agriculture represents 1.6% of all jobs in the United States and 5.9% of jobs in rural areas of the United States (USDA, 2009). Agriculture affects U.S. employment indirectly by supporting industries such as agricultural services and agricultural processing and marketing (USDA, 2009). Students now have opportunities to work in specific concentrations instead of going back home to work on the farm (Thiesse, 2012). Students now have the option to work in many areas including teaching (for example, working as extension agents to educate

local farmers), marketing for companies such as machinery and crop production service companies, commodity trading, or working in agricultural production.

Factors Influencing Choice of Career and Major

Many factors can influence come into play when college students choice of career path. Students will typically take into account the quality of life they want when they are older. Factors such as interest in field, academic ability, familiarity, economic stability, and influential people can all play a role in the decision.

Interest in Field

Some students grow up knowing what they want to do in life. These are the students who will go the extra mile to reach their dream job. However, students often settle on a different path due to many factors they can't control. Students will research their chosen career path and explore everything about it. The salary and benefits of that job do not play a role in this decision. In a research study the factor "match with interest" rated over job characteristics, major attributes, and psychological and social benefits in importance when students choose a major (Beggs et al., 2008). Students will seek out schools that are well known for that major or trade.. Most students today are more concerned with the amount of money they can earn. However, there are a few students who pursue their dreams (Mcglynn, 2007).

Academic Ability and Aptitude

Many students choose their major based on their academic ability (Beggs et al., 2008). However, some students do not have the ability or the work habits to succeed in some majors that may require more study than other fields of studies. These students may find a better fit in a less work intensive major that requires fewer difficult classes. This affects the career paths of these students. Other students have the ability to handle majors with greater workloads and

choose the career path that will lead to a job requiring more education. Examples in this category include veterinarians, doctors, or lawyers. For jobs such as these, students need more than one degree.

On the other hand, some students have the drive to put in the work in very labor intensive fields but do not have the intelligence to perform the tasks that are needed for their chosen field (Beggs et al., 2008). These students often receive help from tutors, special education teachers, and special exceptions when taking exams and doing homework. Students are given every opportunity to excel and work in their field.

Based on grade point averages, agriculture colleges are receiving students with good high school GPA's. Studies show that the average high school GPA of agriculture students is above 3.0 (Rocca, 2013). Therefore, students who enter agricultural majors generally have the ability to excel in their selected areas of agriculture.

White Collar vs. Blue Collar

Most parents want their children to go college and get great jobs. However, not all high school students want to or have the ability to go to college. Some students want to be carpenters and construction workers. The workforce will always need the blue collar people who do manual labor jobs (Stamps, 1998). Even though technology continues to evolve and grow, there will always be a demand for trade centered who want to work straight out of high school.

Some high school students join the armed forces after graduating. Such students may want to follow the path of their parents or find that military service is a way to pay for more education. The armed forces can help students who struggle with structure and motivation, something that students need when continuing on to college or trade school (Gilroy, 2007).

Some students will go to trade schools instead of attending college. Trade schools can provide training in fields such as mechanics, welding, electricity, or plumbing (Stamps, 1998). The short school year allows students to go to work more quickly after graduating from high school instead of having to stay in school for four or more years. Trade schools also allow students to work in a field of interest while going to school.

Personality

Personality is another important factor in career choice. Studies have shown that students will choose a major that they think will fit their personality type (Mihyeon, 2009). The confidence that a student has can determine how far a student will go with their education. Students who believe in themselves have more confidence and are more likely to go for what they want instead of settling for something that is comfortable.

The personality of students can also play a role in choosing a major. According to studies, students who have an investigative personality are more likely to major in science fields. Students with an artistic personality are more likely to major in arts and in interdisciplinary fields. Students who are very social people are more likely to major in the social sciences (Porter and Umbach, 2006).

Influential People

Family and friends are considered to be an influential part of students' choice of major. Parents with an agriculture background most often have an impact in where students go to college. Family role models have more of an influence on what students major in (Wildman and Torres, 2002).

There are many people in a student's life who can influence their career decisions. Most of the time, parents and friends play a large role, but coaches and teachers can also have a huge impact

on a student's life (Wildman and Torres, 2002). Teachers and coaches can help a student to do better in school, to get into college or to get on a better path. The impact that these adults have on young students can have a major influence on their career path.

Academic or athletic coaches are role models for students and also play a big part in molding future generations. Coaches help prepare young men and women for the challenges outside of high school by exposing them to challenges including situations in and out of the classroom (Blum, 1995). How students react to these lessons early in life can play a big part in what decisions students make down the road. A bad role model or coach can have a negative influence leading to bad life choices, while a good role model or coach can have a positive influence leading to good decisions.

Family Business

Students whose parents own and operate small businesses may want or feel obligated to follow in their parents' footsteps (Zody et al., 2006). Students may consider the ease of life that is available to them because a job would be available to them right out of school, they could hold a high position within the business, and there is a possibility that they might own and operate the business one day. However, children of family business owners often have more experience with how the business world operates. These students have often worked in the family business their whole life, experiencing all of what their parents went through in the day to day operation of the business. This can have a positive or negative effect on the student.

Economic Stability

Many students believe that to live a comfortable lifestyle they need to be economically stable. When these students look into a major or a career path, they seek out the higher salary jobs or they look for majors that involve the most job security (Wildman and Torres, 2002). The

financial aspects that students consider include high earning potential, benefits, and opportunities for advancement (Beggs et al., 2008). Given the current economy, and American culture, many students think they need a high paying job to make it in society these days.

Along with stability during their career, some students may even look ahead to retirement. Students want to make sure they are secure for the rest of their lives, and may look into careers that have benefits to help them in the long run (Wildman and Torres, 2002).

Gender

In the past, gender roles in the work force have been uneven and unfair (Bronstein and Farnsworth, 1998). Women usually had lower paying jobs than men (Bronstein and Farnsworth, 1998). Currently the playing field between the two are more even. However, when looking at the workforce you can still find men and women in stereotypical job fields (Greenwood, 1999). Studies have shown that young men and women have different styles when it comes to choosing a career (Mihyeon,2009). Men have a more liberal and progressive style of thinking. Women prefer a hierarchical style of thinking (Mihyeon, 2009).

Race

Along with gender differences in employment, there are also differences in race. In the past, minorities faced many barriers when trying to enter the workforce. However, the workforce is now required to have ethnic diversity among employees. The gains in diversity have been small because of career choices made by minorities, going from blue collar jobs to jobs in corporate and business settings (Gittleman and Howell, 1995). Studies have also shown that colleges have trouble bringing more ethnicities into agricultural majors. A major portion of ethnic students

major in areas other agriculture, whereas the Caucasian race still represents a major part of the student body in agricultural colleges (Rocca, 2013).

Outside Factors

There are many outside factors that can affect how a young man or woman will choose their career. The environment in which a student grows up plays a vital role in their choice of career path. If a student grows up in an environment where all young men and women go straight to work after a high school, that student will be more likely to go straight into the workforce as well (Swanson and Fouad, 1999).

Some students have more opportunities than others; some have scholarships to go to college, some have the connections to help them go further, and some come from wealthier families. These things make it easier for a student to choose any career path they might like, compared to a student who does not have these opportunities (Cross and Slater, 1997).

Factors Affecting Career Selection in Agriculture

There are a variety of factors that affect agricultural students. McGraw et al. (2012) reported that college students who major in agribusiness have been most influenced by factors that include great advancement opportunities, salary and benefits, and the work atmosphere.

The people who most affect a student's choice of major are friends, parents, teachers, and alumni (Herren et al., 2011). The people affecting a student's career choice tend to provide more insight about the career field including factors such as how big of a salary it offers, how fast a student can advance, or the benefits that come with that job field.

Family and friends with a background in agriculture oftentimes have an impact in a students' decision to major in agriculture (Wildman and Torres, 2002). There are also great opportunities for advancement and job placement in the agricultural field, including careers that are both

directly and indirectly related to agriculture (USDA, 2009). Students' interest oftentimes match the interest with the field of agriculture.

Prior experience in agriculture, other agriculture experiences, and relatives in agriculture had the biggest impact on students when choosing to major in agriculture (Wildman and Torres, 2002).

Students also indicated that agribusiness professionals and extension agents had a major impact in choosing a major (Wildman and Torres, 2002).

FFA and 4-H

Future Farmers of America (FFA) teaches high school students about topics related to agriculture through classes, hands on experience, competitions, and conventions (Battle, 2003).

4-H is a volunteer organization that teaches young men and women about agriculture (Battle, 2003). Both FFA and 4-H teach young students about leadership, team cooperation, and decision making that can help students the rest of their lives (Battle, 2003).

Students who grew up on a farm or participated in FFA or 4-H often go into a career field involving agriculture. However, a study at Michigan State University shows that only one quarter of students enrolled in agriculture or natural resources were involved in FFA or 4-H (Shurestha et al., 2011). The study also shows that less than one fifth of the survey population had farm experience (Shurestha et al., 2011). These percentages may differ from state to state, but show that a large percentage of agriculture students had urban and suburban areas.

Changes in Major Fields

Students often change majors during their college career. Research has shown that 50 to 75% of students change their major at least once during their college career (Cunningham, 2009).

Students change their majors for several reasons: hasty initial decisions without the proper knowledge, peer pressure, improper use of resources, or poor academic performance

(Cunningham, 2009). When deciding to change majors the choice of a new major is most influenced by the reputation of the major itself (Cunningham, 2009).

Tools Used for Career Choices

Students may be unsure about a career path or may be unable to choose between two career paths. There are tools for students in college and high school to help them choose a career. These tools include career tests, career counseling, job fairs, and job shadowing. Career tests usually offer a wide range of questions that will pool all of a student's interests and group them into possible job fields and majors. Career tests can show where students need development in skills or experience (Trusty et al., 2005). Students can also take advantage of many college prep courses to help them to sharpen skills that are needed to be successful in college. Some courses involve taking tests that will show activities and interests that can help students decide what path to follow.

Guidance counselors can also help students by trying to match the personalities of students to careers that would fit them best (Alfred-Davidson, 2009). Counselors also help students to enhance skills such as communication, leadership, teamwork, and information gathering. When students graduate from college, counselors can help students into the career field. Counselors help students put resumes together, practice interviewing techniques, and find job openings in related fields (Alfred-Davidson, 2009).

Recruiting

Recruiting is another factor that plays a role in a student's decision making process. Students can be recruited by different schools because of academic performance. Schools and corporations both use recruiting as a way to draw in more students or potential employees (Herren et al., 2011). Students are recruited by companies to bring in new ideas and more talent

to help companies grow. Recruiters from companies will show the benefits of working for that corporation to try and sway the student's decision. Recruiters use videos, brochures, coffee mugs, and many other things to promote their company.

One way recruiters can meet students is by going to career fairs and colleges. Recruiters will go to a career fair to promote the company to future college graduates. Career fairs are face to face meetings between jobseekers and employers (HACCC, 2013) and are a great way for students to see what companies have to offer.

EmploymentAfter Graduation

In today's workforce it is getting harder for college graduates to get jobs in their field of interest. Students get discouraged when entering the workforce if they cannot find a job related to their major. Sometimes the economy limits the number of jobs that are available for recent college students (Nabi, 2003). Students may have to wait long periods of time for a job in their chosen field, settling for jobs that are lower paying and out of their field of interest. Students who have outstanding student loans are forced into other fields to earn money to pay off loans. Nationwide, companies are offering 17% less entry level positions to graduates than in previous years (Lee, 2008). Employers are becoming more selective in their search for new employees, often requiring more experience in the work force (Lee, 2008).

Students often expect to start out with a high paying position (Devlin and Peterson, 1994). In contrast, most newly graduated students have to start from the bottom as interns and work up. There are a few positions that start at the top out of a student's field; students trained as doctors, nurses, or veterinarians, for example, have a better chance of getting high paying positions. Students lack the skills or experience needed to perform tasks for the jobs in their field (Nabi, 2003). Students may lack people skills, often meaning that a student is shy or has a hard time

communicating with the public. Students who have never worked also lack the basic job skills that are needed to perform day to day operations.

While in college, students often do not have a job. This leads to a lack of experience, and students have to take lower level positions when starting out in their careers. There are a number of students who do land a great job when graduating from college. This happens if a student has worked for a company for a long period of time during college or during summers. Students who get great jobs may also be highly qualified for the job, or the job may be in a field with high demand. Research shows that students who find internships in their career field secure jobs in their major more than students who do not (Callanan and Benzing, 2004). A declining job market takes students out of the entry-level positions.

Chapter 3: Methodology

To meet the research objectives of this study, a survey was developed to determine what influences a student's choice of major and career. The questionnaire consisted of 36 questions pertaining to the size of the school that students attended, the environment students grew up in, and the organizations in which students participated. The questionnaire also included questions to determine how important specific job skills and courses are to students. A scale of 1 to 5, with 5 being very important and 1 being not necessary, was used. The questionnaire also included questions that asked how dedicated students were for their career path and what factors played a role in choosing a major. The survey was approved by the UT Martin IRB (13-231-E05-4005). See appendix for complete questionnaire.

Survey Population

The survey was administered to 128 freshmen who are majoring in agriculture. The survey population consisted of the agriculture freshman studies group (GENS 101) at the University of Tennessee at Martin. Students were from 17 to 19 years old, with the exception of one student who was 30 years old. The students majored in agriculture with concentrations in Agricultural Business, Plant and Soil Science, Animal Science, Agricultural Engineering, or Pre-vet. The students completed a paper copy of the questionnaire during the first week of school, in August 2013.

Data Analysis

All of the information collected from the questionnaire was typed into a spreadsheet in Microsoft Excel (2007 version). Excel and SAS (SAS v. 9.3, SAS Institute Inc., Cary NC) were used to analyze the data. Chi-squared test and Fisher's exact test were used to see if the

relationships among factors were significant. A significance level of 0.10 was used. The average and standard deviation formulas in Excel were used to summarize the results for the importance of job skills and courses. The data were also summarized in pie charts and bar graphs to show percentages and number of students in each group.

The projected career paths for students were combined into four groups for the chi-squared tests: Agribusiness, Science and Engineering, Veterinarian (Vet) and Veterinary Technician (Vet Tech), and Other. Agribusiness consisted of bankers, agribusiness professionals, business owners, and international companies. Science and Engineering consisted of plant scientist, soil scientist, animal scientist, agricultural engineers and engineers. The Vet and Vet Tech group consisted of students whose projected career path was Vet or Vet Tech. The other group consisted of students who plan to be pharmacists, landscape designers, teachers, farmers, and physical therapists.

Chapter 4: Results and Discussion

Out of the 128 students surveyed, 60% were female and 40% were male. The top six concentrations were Agribusiness (25%), Pre-Vet (23%), Animal Science (17%), Vet Tech (10%), and Agricultural Engineering Technology and Plant and Soil Science (each with 7%; Figure 1). The other 11% of students chose other areas including Agriculture, Biology, Physical Therapy and Undecided (Figure 1). The largest number of survey respondents projected their career path to be veterinarian (Figure 2). Veterinarian was followed by agribusiness professionals and veterinary technician as career choices.

Most of the students (72%) scored 20-25 on the ACT (Figure 3). Thirty-five percent of the students participated in both FFA and 4-H, whereas 27% participated only in FFA, 13% participated only in 4-H and 25% did not participate in any agricultural organizations in high school (Figure 4).

Survey Results for each Objective

Objective 1: Did FFA or 4H influence students on choosing a major?

There was a significant (0.0001) relationship between agriculture organization (FFA or 4-H) and whether or not it influenced choice of major. More students indicated that FFA influenced them when choosing a major compared to 4-H (Figure 5). Taking the objective one step further, a chi-squared test was used to determine if expected career was related to participation in agricultural organizations. Students who want to be veterinarians and veterinarian technicians were the largest group with participation in FFA (Figure 6). However, they were also the largest group that had not participated in either FFA or 4-H. There was a significant ($P=0.075$) relationship between participation in FFA and 4-H and the type of career chosen. Of the four

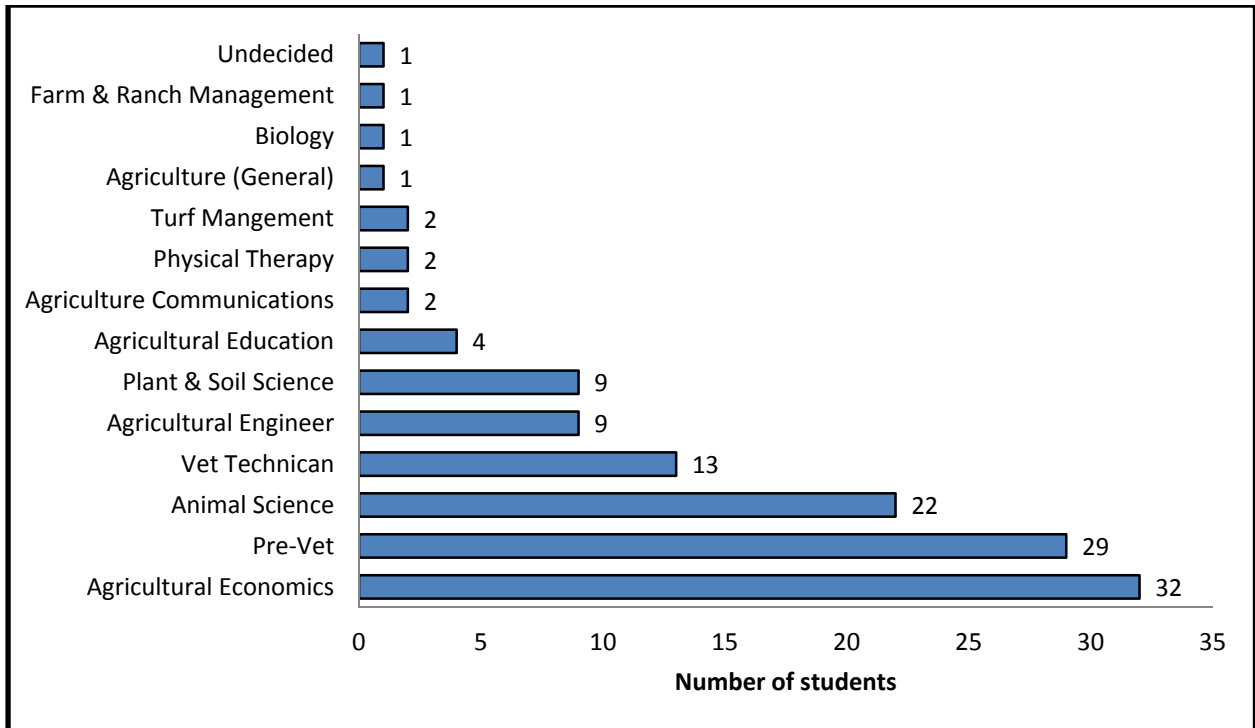


Figure 1. Number of freshman agriculture students in each major concentration at UT Martin, August 2013.

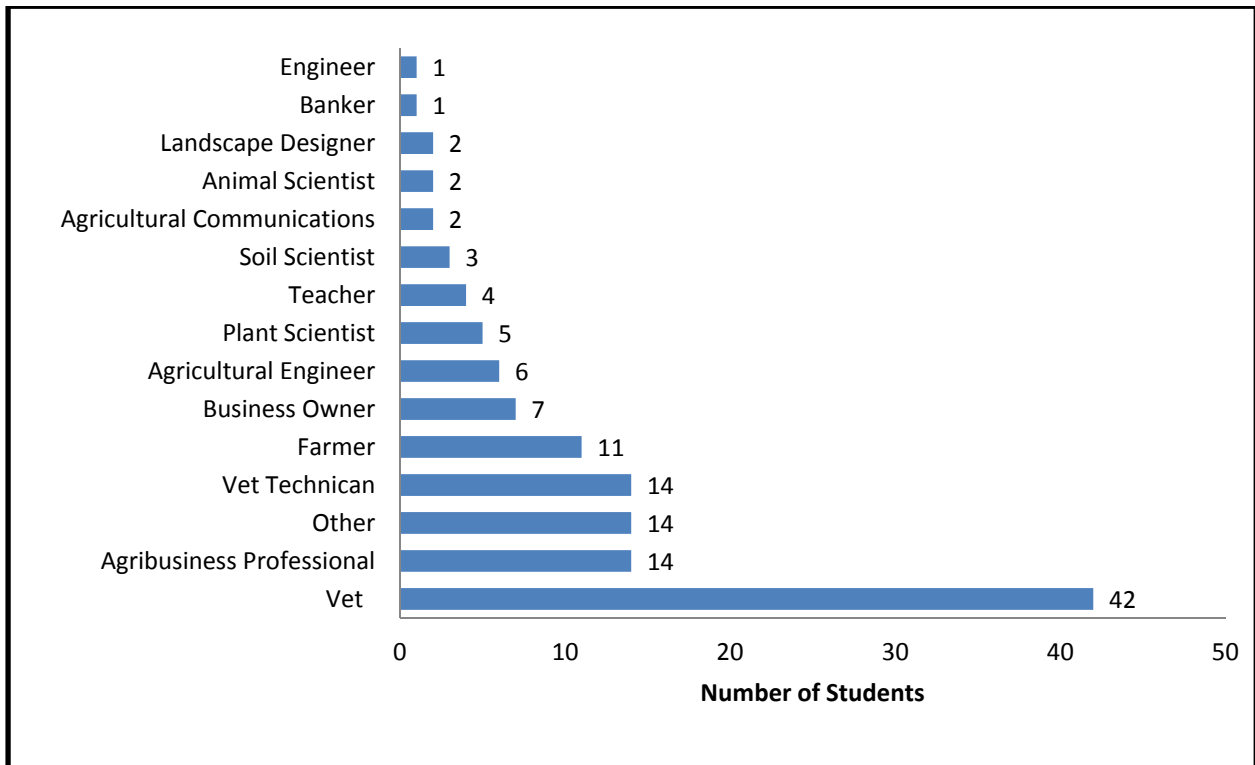


Figure 2. Number of freshman agriculture students in each predicted career path.

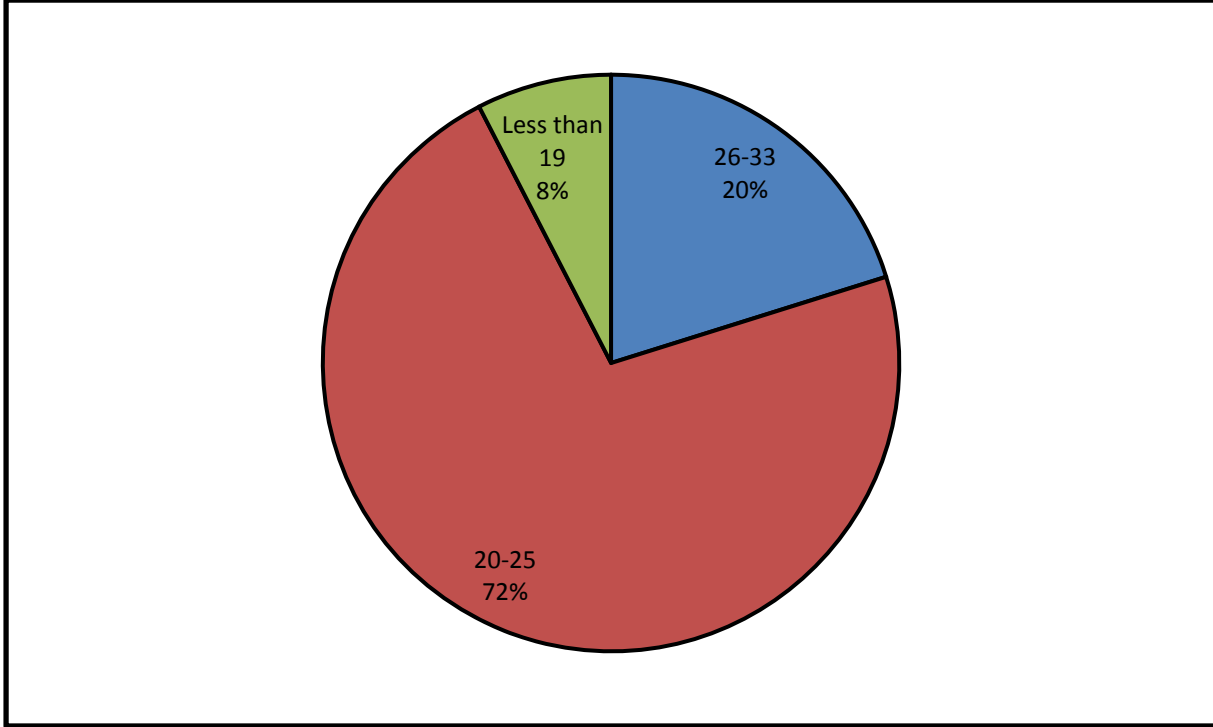


Figure 3. Percentage of freshman agriculture students at UT Martin with ACT scores in the indicated ranges.

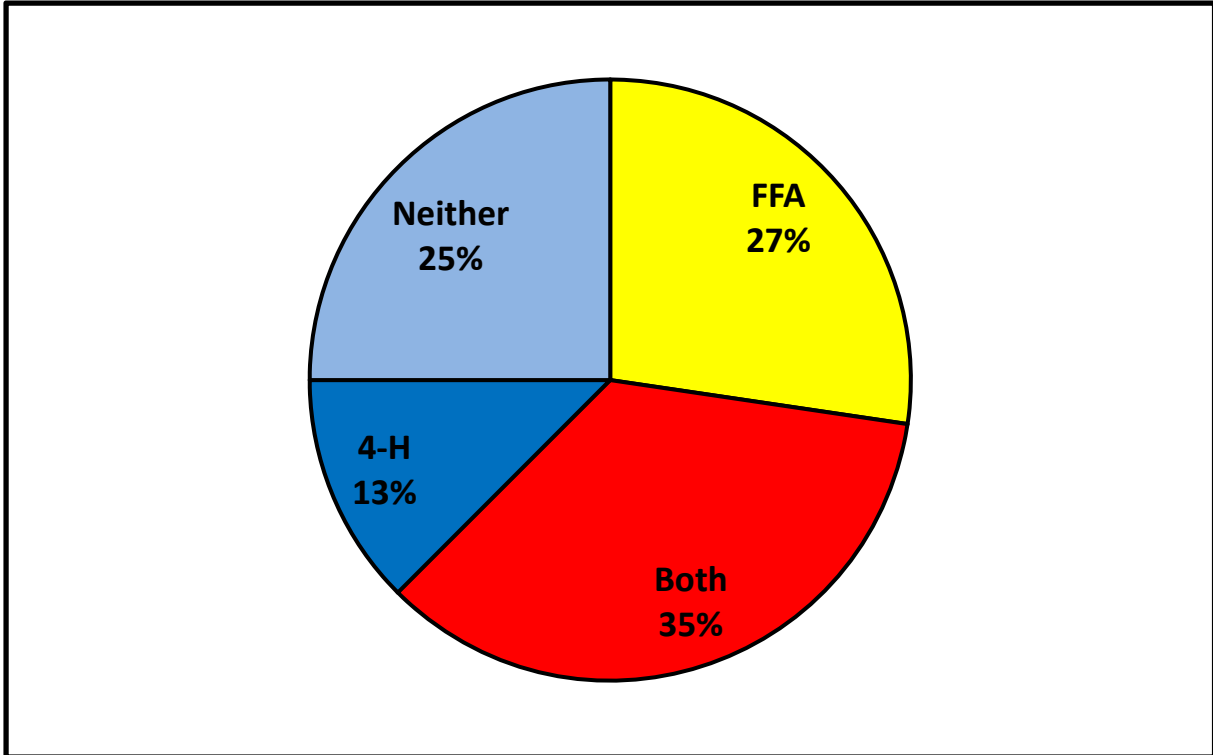


Figure 4. Percentage of freshman agriculture students at UT Martin who participated in FFA and 4-H while in high school.

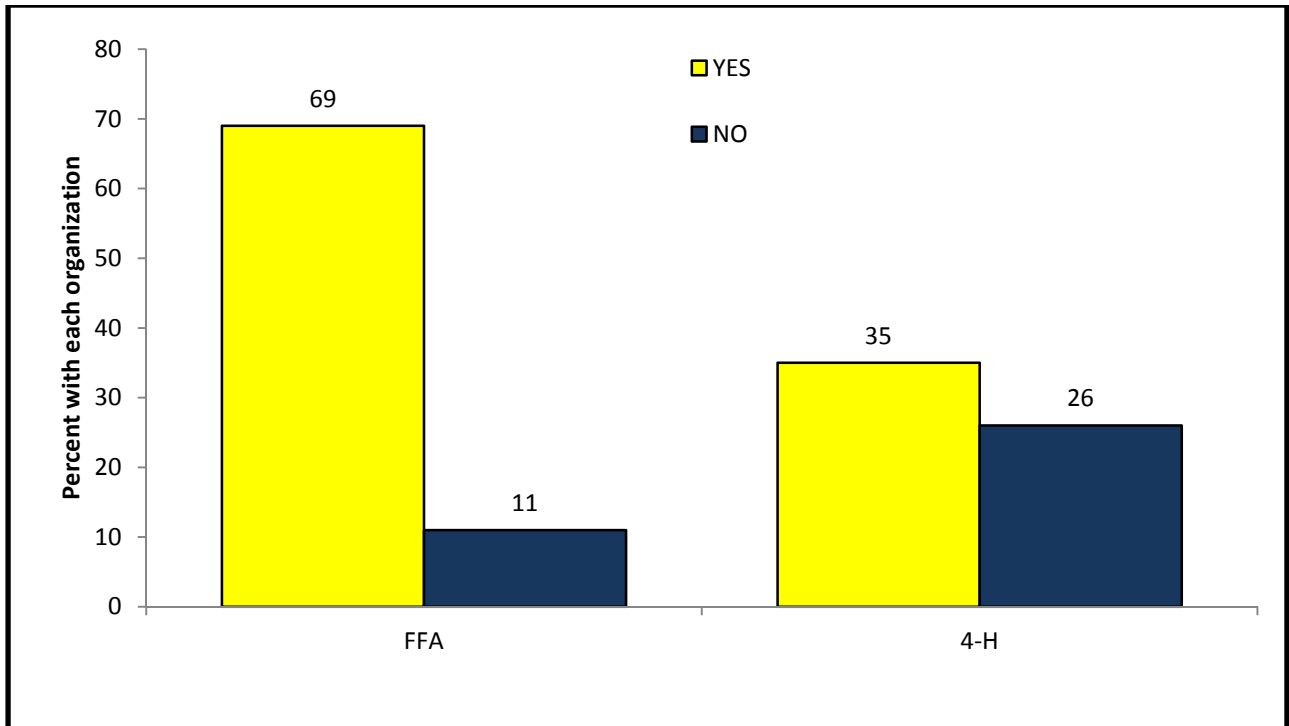


Figure 5. Percent of students who indicated that participation in FFA or 4-H influenced or did not influence their choice of major (expressed as a percent within each organization). Numbers above each bar represent counts. Chi-square p-value=0.0001.

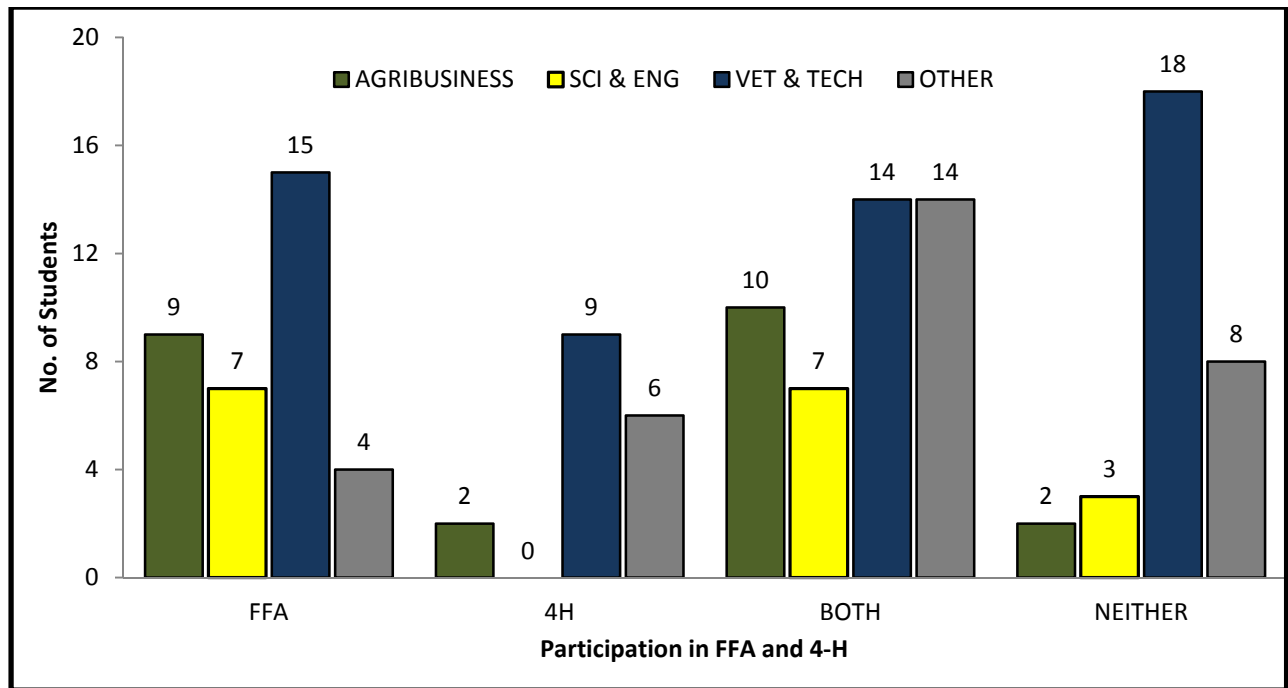


Figure 6. Number of freshman agriculture students in FFA/4-H grouped by projected career path.

groups, students who want to be vets or vet tech had the highest percentage of students who had not participated in FFA or 4-H (Figure 7). On the other hand, FFA, either alone or in combination with 4-H, appeared to be more important to students planning careers in agribusiness or science and engineering.

Objective 2: How important are classes/job skills to a student's area of study?

Students were asked to rate the importance of various courses and job skills; a scale of 1-5 was used, with 1 being not necessary and 5 being very important. According to the average ratings, students believe that the two most important classes are biology and communications (Table 1). Classes of least importance were fine arts and history with means of 2.4 and 3.2, respectively. Students rated time management, career planning, personal finance, and group skills as the most important job skills (Table 3). Students believe that the least important job skills are foreign language skills and international experience. The standard deviations for all of the class and job skill are very low. These results show that the students had similar ranks for the importance of the job skills and classes.

As expected, introductory agriculture courses received high ratings, ranging from an overall average of 3.9 for animal science to 4.2 for agricultural engineering and agricultural economics (Table 2). Ratings for individual careers varied among career paths, as expected (Tables 2 and 3). For example, students planning careers in landscape design, plant science, or soil science rated plant and soil science courses much higher (ratings of 4.7 to 5.0) than those planning to be vet techs (ratings of 2.5 for both courses).

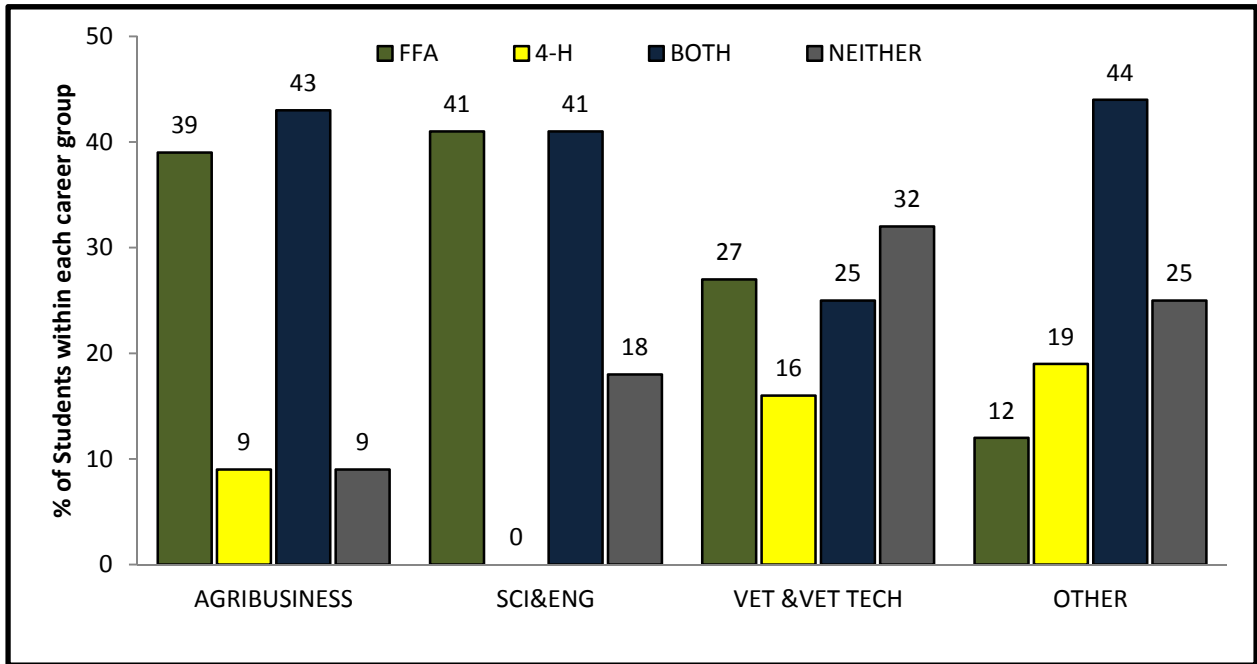


Figure 7. Percent of freshman agriculture students in FFA/4-H grouped by projected career path. Chi-square p-value=0.075.

Table 1. Means and standard deviations* for importance rankings of college classes, grouped by projected career paths of freshman agriculture students.**

Career	No. of Students	English	Communications	Math	Statistics	Economics	Finance	Accounting	Management	Fine Arts	History	Geography
Agricultural Communications	2	4.5(0.7)	5.0(0.0)	4.5(0.7)	3.5(0.7)	4.0(0.0)	4.0(0.0)	3.5(0.7)	4.5(0.7)	2.0(1.4)	3.5(0.7)	4.0(0.0)
Engineer	14	2.7(1.1)	3.6(0.8)	4.9(0.4)	3.4(1.0)	3.6(1.3)	3.6(0.5)	2.9(0.4)	3.4(0.8)	1.9(0.9)	2.7(0.8)	2.7(0.5)
Agribusiness Professional	2	3.9(0.7)	4.5(0.7)	4.4(0.7)	4.1(0.7)	4.6(0.6)	4.4(0.8)	4.3(0.9)	4.6(0.6)	2.3(0.9)	3.0(0.8)	3.8(1.0)
Animal Scientist	8	4.5(0.7)	4.5(0.7)	5.0(0.0)	4.5(0.7)	5.0(0.0)	4.5(0.7)	3.5(0.7)	5.0(0.0)	3.5(0.7)	4.0(0.0)	4.0(0.0)
Business owner/Banker	7	3.6(1.6)	4.5(0.8)	4.1(1.0)	3.8(1.0)	4.8(0.5)	4.6(0.7)	4.5(0.8)	4.8(0.5)	2.4(1.2)	3.1(0.6)	3.6(0.9)
Farmer	11	3.6(1.1)	4.1(1.0)	4.3(0.6)	3.9(1.0)	4.5(0.5)	4.5(0.7)	4.5(0.7)	4.5(0.7)	1.9(0.8)	2.9(0.5)	3.6(1.1)
Landscape Designer	2	3.0(0.0)	4.0(1.4)	4.0(1.4)	3.0(0.0)	3.5(0.7)	3.5(0.7)	3.0(0.0)	5.0(0.0)	2.5(0.7)	2.5(0.7)	3.5(0.7)
Other	14	3.7(1.0)	4.1(0.9)	4.3(0.8)	3.6(1.3)	3.5(1.6)	3.5(1.7)	3.2(1.7)	3.8(1.5)	2.1(0.9)	3.1(0.9)	3.2(1.3)
Plant Scientist	5	4.4(0.9)	5.0(0.0)	4.6(0.5)	4.6(0.5)	4.0(1.0)	4.2(0.8)	3.6(0.5)	4.4(0.9)	2.2(0.8)	2.8(1.3)	4.2(0.8)
Soil Scientist	3	3.3(0.6)	3.3(1.5)	3.7(0.6)	4.3(0.6)	4.0(1.0)	3.3(1.5)	3.3(1.5)	4.0(1.0)	2.7(0.6)	3.7(1.2)	4.0(1.0)
Teacher	4	3.8(1.0)	5.0(0.0)	3.3(0.5)	3.3(0.5)	3.3(1.3)	3.5(0.6)	3.3(0.5)	4.0(1.2)	2.5(1.0)	3.5(0.6)	3.3(1.3)
Veterinarian	42	4.0(0.7)	4.4(0.7)	4.4(0.7)	3.6(0.9)	3.8(0.9)	3.9(0.8)	3.5(1.0)	4.4(0.7)	2.3(1.0)	3.1(0.8)	2.7(1.1)
Veterinary Technician	14	3.8(0.9)	4.5(0.8)	4.2(0.7)	3.5(1.1)	3.4(1.2)	3.6(0.9)	3.3(1.3)	4.1(0.8)	2.4(1.2)	3.1(0.9)	3.1(1.2)
Overall	128	3.8(0.4)	4.3(0.5)	4.3(0.3)	3.8(0.3)	4.0(0.5)	3.9(0.4)	3.6(0.5)	4.3(0.4)	2.4(0.2)	3.2(0.3)	3.5(0.4)

*Standard Deviation in Parentheses

**5-Very Important 4-Important 3-Neutral 2-Unimportant 1-Not Necessary

Table 2. Means and standard deviations* for importance rankings of science and agriculture classes, grouped by projected career paths of freshman agricultural students**

Career	No. of Students	Biology	Chemistry	Physics	Animal Science	Agricultural Economics	Agricultural Engineering	Plant Science	Soil Science
Agricultural Communications Engineering	2	4.5(0.7)	3.5(0.7)	3.5(0.7)	4.5(0.7)	4.0(0.0)	4.0(0.0)	4.0(0.0)	4.0(0.0)
Agribusiness Professional	2	3.9(1.2)	3.4(1.2)	2.9(0.7)	3.4(0.7)	3.6(0.8)	4.7(0.5)	4.1(0.9)	4.1(0.9)
Animal Scientist	8	5.0(0.0)	5.0(0.0)	5.0(0.0)	5.0(0.0)	5.0(0.0)	4.5(0.7)	3.5(0.7)	3.5(0.7)
Business owner/Banker	7	3.8(1.0)	3.5(1.1)	3.0(0.9)	3.8(1.0)	3.4(0.9)	4.6(1.1)	3.8(1.3)	3.8(1.3)
Farmer	11	4.4(0.7)	3.7(1.1)	3.0(1.0)	3.7(1.5)	4.0(0.9)	4.8(0.4)	4.3(0.9)	4.3(0.9)
Landscape Designer	2	4.5(0.7)	3.5(0.7)	3.0(0.0)	3.0(0.0)	3.5(0.7)	4.5(0.7)	5.0(0.0)	5.0(0.0)
Other	14	4.6(0.5)	4.1(1.0)	3.4(1.3)	3.9(1.5)	3.1(1.4)	3.7(1.5)	3.4(1.7)	3.4(1.6)
Plant Scientist	5	4.8(0.4)	5.0(0.0)	3.6(0.5)	2.8(1.1)	4.6(0.5)	4.4(0.5)	5.0(0.0)	5.0(0.0)
Soil Scientist	3	3.0(2.0)	3.0(2.0)	2.0(1.0)	3.0(2.0)	3.7(0.6)	3.3(0.6)	4.7(0.6)	5.0(0.0)
Teacher	4	4.5(0.6)	3.5(1.3)	2.8(1.0)	5.0(0.0)	4.0(1.2)	4.8(0.5)	5.0(0.0)	4.8(0.5)
Veterinarian	42	4.9(0.3)	4.8(0.5)	3.7(1.0)	4.9(0.6)	3.1(0.9)	4.1(0.7)	3.2(1.1)	3.1(1.1)
Veterinary Technician	14	4.9(0.4)	4.5(0.8)	3.4(0.9)	4.6(1.1)	2.6(1.3)	3.5(1.2)	2.5(1.2)	2.5(1.2)
Overall	128	4.3(0.5)	3.9(0.5)	3.3(0.4)	3.9(0.6)	4.2(0.4)	4.2(0.4)	4.0(1.3)	4.0(1.3)

*Standard Deviation in Parentheses

**5-Very Important,4-Important,3-Neutral,2-Unimportant,1-Not Necessary

Table 1. Means and standard deviations* for importance rankings of job skills, grouped by projected career paths of freshman agriculture students.**

Career	No of students	Career Planning	Speaking	Time Management	Computer Skills	Precision Ag	Group Skills	Human Resources	Conflict Resolution	Finance Skills	Language Skills	International
Agricultural Communications	2	4.0(0.0)	4.0(0.0)	4.0(0.0)	4.0(0.0)	4.0(0.7)	5.0(0.7)	5.0(0.7)	5.0(0.7)	5.0(0.7)	3.0(0.0)	3.0(0.0)
Agribusiness Professional	14	4.4(0.6)	4.4(0.6)	4.4(0.8)	4.4(0.8)	3.7(1.1)	4.4(0.8)	4.4(0.8)	4.4(0.9)	4.4(0.8)	2.8(1.1)	3.1(1.2)
Animal Scientist	2	5.0(0.0)	5.0(0.0)	5.0(0.0)	4.5(0.7)	4.0(0.0)	4.5(0.7)	4.0(0.0)	5.0(0.0)	5.0(0.0)	3.5(0.7)	4.0(1.4)
Business Owner/ Banker	8	4.3(0.9)	4.3(0.9)	4.0(1.1)	4.0(0.8)	3.5(1.1)	3.6(0.7)	3.3(0.7)	3.9(1.0)	4.6(0.5)	3.0(1.2)	3.0(1.3)
Engineer	7	4.1(1.1)	3.6(1.4)	4.7(0.8)	3.9(1.1)	4.1(0.9)	3.6(0.8)	3.7(0.8)	3.9(1.1)	4.1(0.9)	2.3(1.3)	2.9(1.1)
Farmer	11	3.4(0.9)	3.5(0.9)	4.2(0.9)	3.8(0.8)	4.4(0.9)	3.6(0.8)	3.1(1.2)	3.6(0.9)	4.3(0.6)	2.1(1.4)	2.4(1.4)
Landscape Designer	2	4.0(1.4)	3.5(0.7)	4.5(0.7)	3.5(0.7)	3.0(0.0)	4.0(1.4)	4.0(1.4)	3.5(0.7)	3.5(0.7)	3.5(0.7)	3.0(0.0)
Other	14	4.1(1.1)	3.6(1.2)	4.4(1.1)	3.4(1.1)	3.5(1.5)	4.3(0.8)	3.7(1.1)	4.2(1.0)	3.6(1.7)	3.6(1.5)	3.3(1.4)
Plant Scientist	5	4.4(0.9)	4.4(0.9)	4.6(0.9)	4.4(0.9)	4.2(0.8)	4.8(0.4)	3.8(0.8)	4.2(0.8)	4.2(0.8)	3.8(1.3)	4.2(1.3)
Soil Scientist	3	3.7(1.2)	4.0(1.0)	4.0(1.0)	3.0(2.0)	4.3(1.2)	4.3(1.2)	3.7(1.2)	4.0(1.0)	3.0(1.0)	2.7(0.6)	4.0(1.0)
Teacher	4	4.8(0.5)	5.0(0.0)	4.8(0.5)	4.0(0.8)	5.0(0.0)	4.8(0.5)	4.3(0.5)	4.5(0.6)	4.0(0.8)	2.8(1.7)	3.8(1.0)
Veterinarian	42	4.4(0.8)	4.3(1.0)	4.7(0.7)	4.0(0.8)	3.3(1.0)	4.3(0.9)	3.6(0.9)	4.5(0.8)	4.3(0.7)	3.3(1.0)	3.2(1.1)
Vet Tech	14	4.3(1.0)	4.0(1.0)	4.5(0.8)	4.2(1.0)	3.7(1.3)	4.4(0.7)	3.9(1.1)	4.4(0.8)	4.1(1.2)	3.4(1.2)	2.9(1.30)
Overall	128	4.2(0.9)	4.1(1.0)	4.5(0.8)	4.0(0.9)	3.7(1.1)	4.2(0.8)	3.7(1.0)	4.2(0.9)	4.2(1.0)	3.1(1.2)	3.1(1.2)

*Standard Deviation in Parentheses

**5-Very Important 4-Important 3-Neutral 2-Unimportant 1-Not Necessary

Objective 3: What was the most influential factor in choosing a major?

The factor that most influenced students' choice of major was family, with 27% of students choosing that response (Figure 8). The next most important factor in choosing a major was a career that is personally rewarding (21%). Experience with FFA and 4-H was chosen by 20% of students and 10% chose their major based on specialized career needs. The other 25% of students indicated that job opportunities, teachers, campus visits, friends, income potential or guidance counselors were the most influential when choosing a major. Similar to the results of this study, Herren et al. (2011) found that parents and guardians were the people who most influenced students when choosing to major in an agricultural field. On the other hand, Wildman and Torres (2002), found that family and friends were only moderately influential when choosing a major. A personal role model was most important in that study. FFA and 4-H experience was considered most influential by 20% of students in the current survey. Wildman and Torres (2002) also found that prior agricultural experience, including FFA and 4-H, was very important to students when choosing a major. Income potential did not rank as high among the current survey population (only 1% chose income potential) as it did in other studies (McGraw et al., 2012)

Objective 4: Did the Size of the Students School play a role in choosing a major?

There was no significant ($p=0.5752$) relationship between the sizes of the schools and choice of planned career expectations (Figure 9). Therefore, size of the school did not play a role in students' choice of a career path. Within each school size category, the Vet and Vet Tech career group was chosen by the highest percentage of students in all school size categories, except the 500-1000 category. There was no significant (0.552) relationship between the size of the schools compared to participation in FFA and 4-H (Figure 10). This shows that the size of a students' school did not affect participation in FFA and 4-H, nor did school size affect career choice.

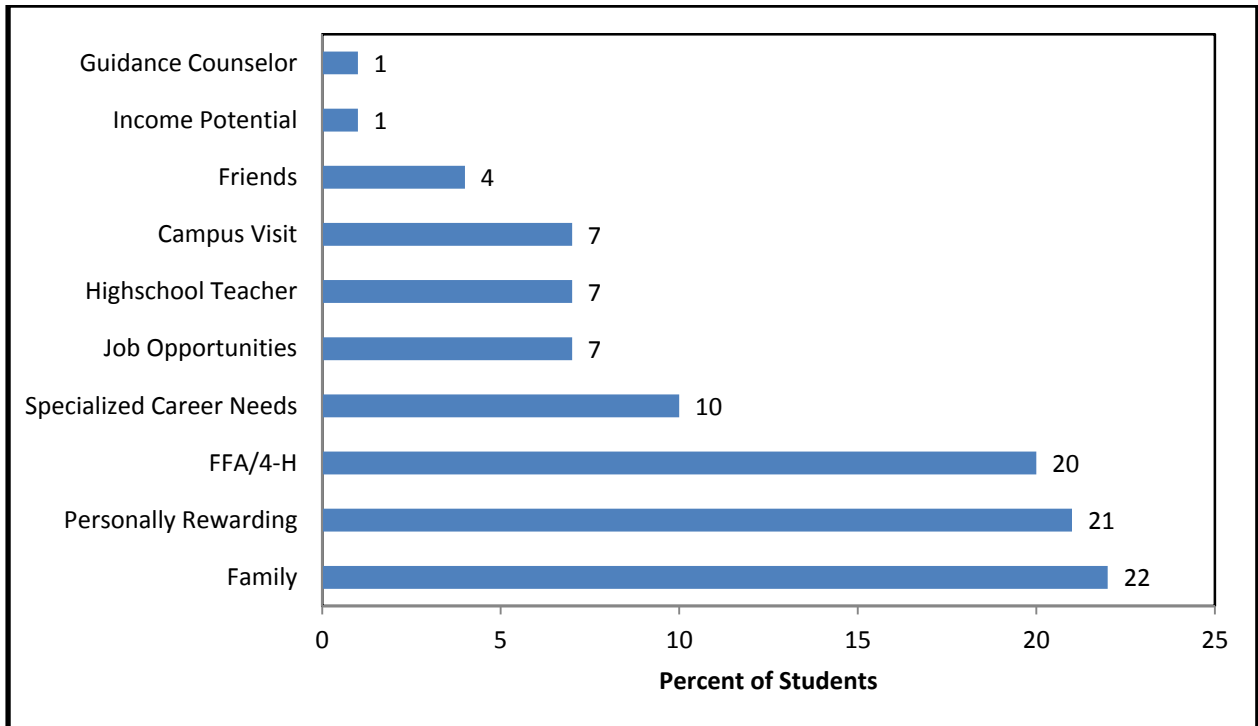


Figure 8. The most important factor that influenced a student's choice of major, as indicated by the survey respondents.

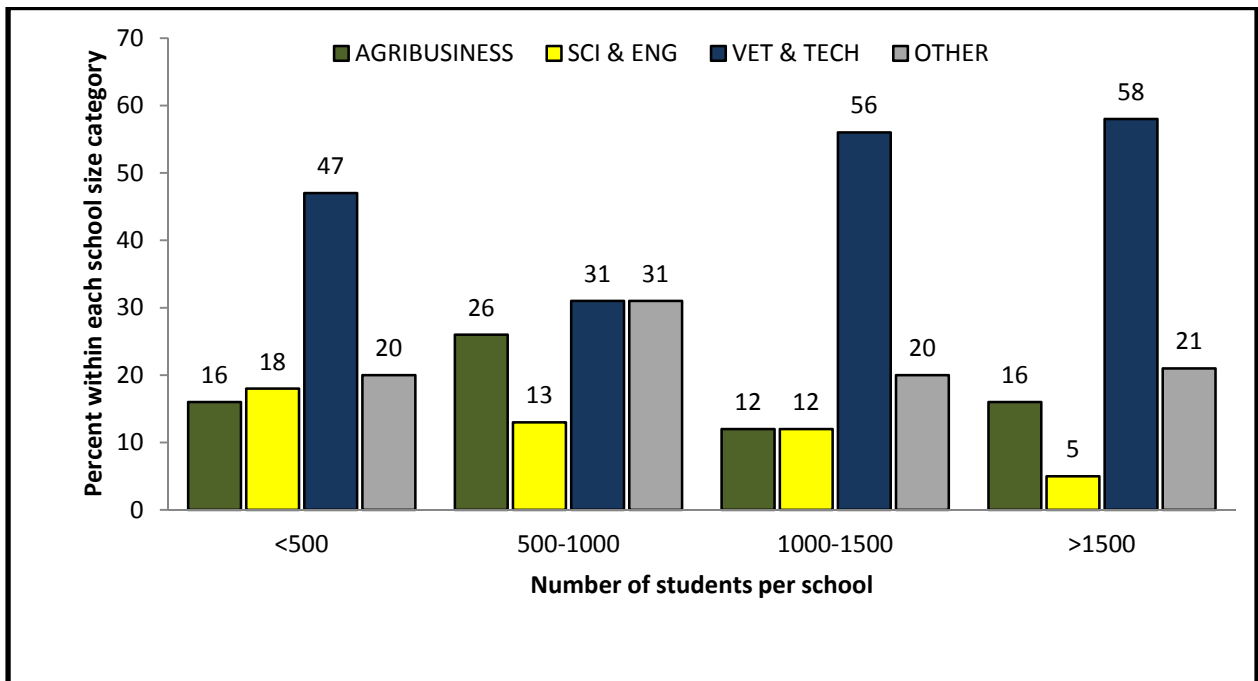


Figure 9. Career choices indicated by freshman agricultural students, expressed as a percent within each school size category. Fisher's Exact Test p-value=0.5752

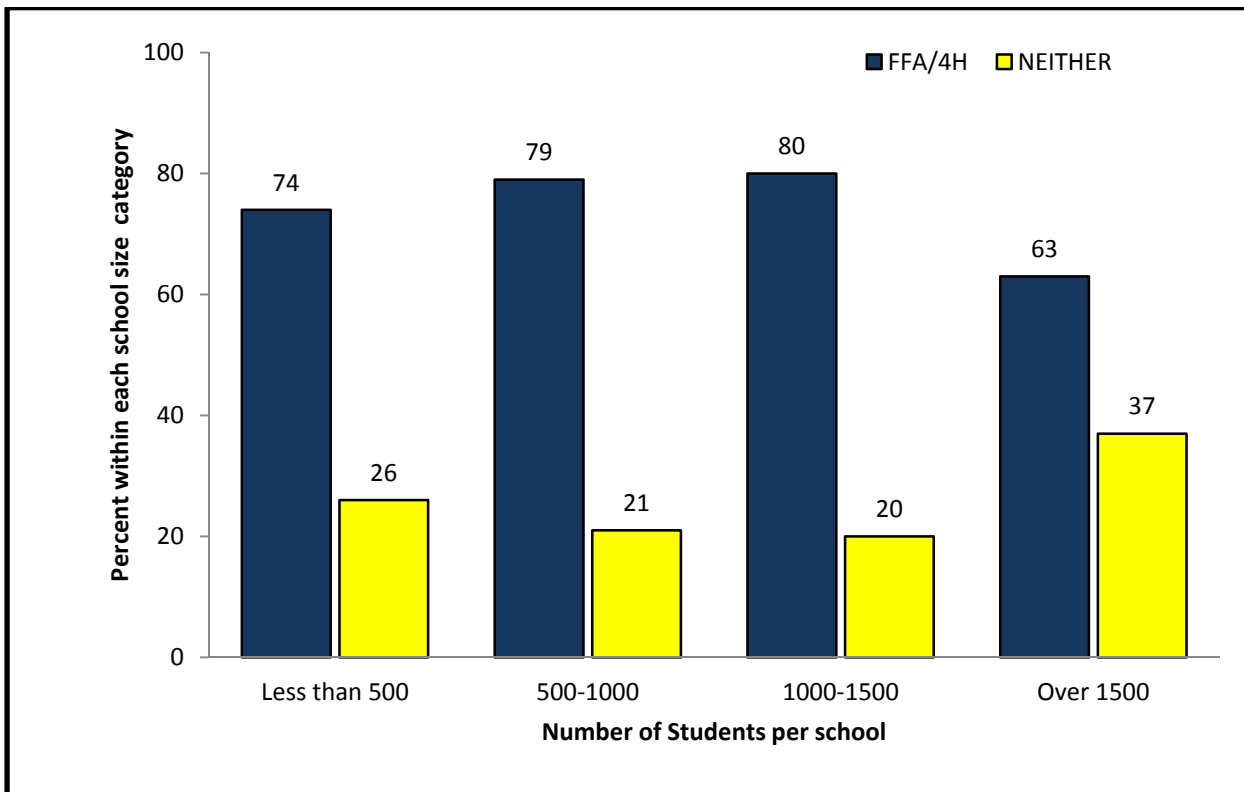


Figure 10. Participation in FFA or 4-H in high school, expressed as a percent within each school size category. Chi-square p-value= 0.552

Objective 5: Did growing up on a farm play a role in choosing a major?

There was no significant ($p=0.1247$) relationship between growing up on a farm and choice of career (Figure 11). Although more students in the vet and vet tech group did not grow up on a farm (54%), this group also had the highest percentage (36%) of students who did grow up on a farm.

On the other hand, there was a significant relationship ($P=0.02$) between growing up on a farm and planning to work in production agriculture (Figure 12). Sixty six percent of students who plan to work in production agriculture grew up on a farm, whereas only 46% of students who do not plan to work in production agriculture grew up on a farm.

Objective 6: Do students believe they will work in degree area?

Students were optimistic about job opportunities; 89% of the students surveyed believe that they will work in their area of study. When asked whether the opportunities of a career in agriculture are excellent, good, fair, limited, or not good, 88% of students believed that career opportunities in agriculture were excellent to good. Only 12% believed the opportunities were fair to limited. Students were also asked if their career would make a positive impact in the world; 83% of students believed that it would. The results of this study show that students have a positive outlook on their futures in the agricultural field.

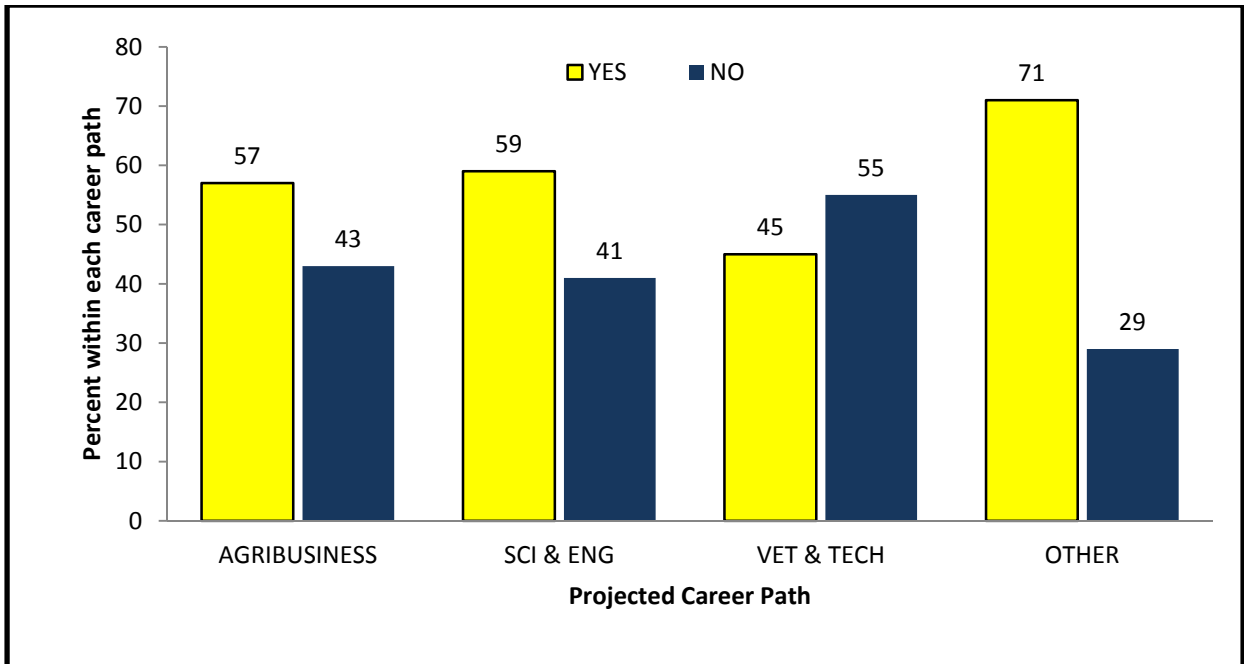


Figure 11. Percent of freshman agriculture students who grew up on a farm and who did not grow up on a farm grouped by projected career path. Chi-square P-Value=0.1247

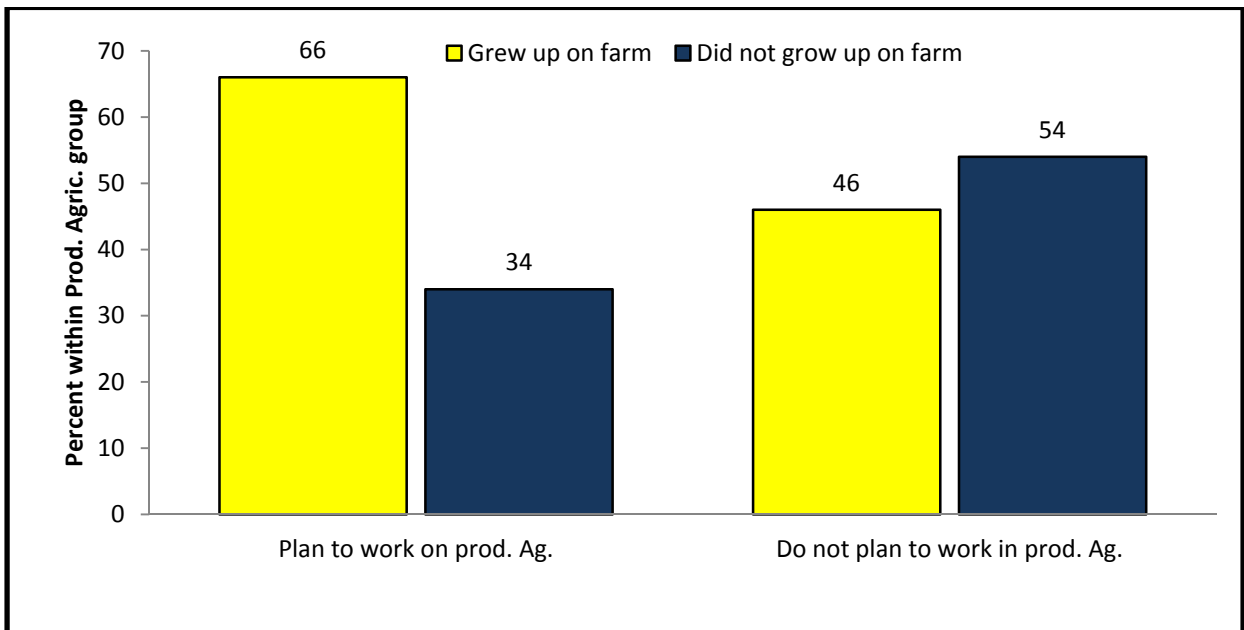


Figure 12. Percent of agriculture students who grew up on a farm or did not grow up on a farm grouped by plans to work in production agriculture. Chi-square P-Value=0.009

Chapter 5: Conclusion

When choosing a major concentration more students in this study were influenced by FFA than 4-H. In addition, there was a significant relationship between participation in agriculture organizations and expected career path.

When students were asked to rate the importance of classes and job skills to their projected careers, biology and communications received the highest overall ratings. Students ranked fine arts and history as the least important. In addition, students ranked time management as the most important job skill and foreign language and international experience as the least important job skills.

Data from the questionnaire showed that the most influential factor when choosing a major was family (27%). The next highest factor when choosing a major was a career that is personally rewarding (20%). These factors were followed by FFA and 4-H, and specialized career needs. Income potential and guidance counselors were considered least important to students when choosing a major.

When comparing the size of schools students attended and the students' choice of career path, results showed there was no significant relationship. In addition, participation in FFA and 4-H was not related to school size.

There was no relationship between students who grew up on a farm and students choice of major. However, there was a significant relationship between students who grew up on a farm and students who plan to have a career in production agriculture; more students with a farm background planned to work in production agriculture.

When asked about their future in agriculture, 89% of students believe they will work in their area of study. Eighty-eight percent believe that there are good to excellent career opportunities in

agriculture. In addition, 83% of students believe that their careers will make a positive impact on the world.

There are a lot factors that influence students when choosing their academic careers, but family was the one factor that had the biggest influence on students in this study. However, FFA and 4-H also play a big role when students pick a career path. The students who were part of the survey population have a positive outlook about their future agricultural careers and believe they can make a difference in the world.

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Appendix A IRB Letter from University of Tennessee at Martin



March 22, 2013

Dr. Joey Mehlhorn
Academic Affairs
CAMPUS MAIL

Office of Research, Grants & Contracts
100 Administration Building
Martin, Tennessee 38238
Office: 731.881.7015
Fax: 731.881.7018

RE: 13-231-E05-4005/Mehl,Joe
IRB Period: 3/22/2013 to 3/21/2014
Career Development Perceptions for Agriculture Undergraduate Students
at UT Martin

Dear Dr.Mehlhorn:

The project listed above has been reviewed and has been certified as Expedited Review by the Institutional Review Board allowing you to conduct your research based on the following: 1. presents no more than minimal risk to the participants and 2. Falls within Expedited Category M Research on individual or group characteristics or behavior (including, but not limited to, research on perception, cognition, motivation, identity, language, communication, cultural beliefs or practices, and social behavior) or research employing survey, interview, oral history, focus group, program evaluation, human factors evaluation, or quality assurance methodologies.

The responsibilities of the investigator(s) are to abide by the regulations governing research involving human participants, including those provisions specifying the means of obtaining informed consent. In all cases, the standards of respect for persons, beneficence, and justice enumerated by the Ethical Principles and Guidelines for the Protection of Human Subjects of Research (Belmont Report) apply to all research involving human participants conducted at UT Martin. Please note that you are also committed to the other Investigator Responsibilities as stated in the Faculty, Staff and Student Guide to Research involving Human Subjects which is available on our website.

All expedited approved research is subject to UTM-IRB review, at least once a year. Please visit our Website for the Change/Termination Form that you will need to complete and submit if your project remains active and UTM-IRB approval needs to be renewed for another year. Unless your research moves in a new direction or participants have experienced adverse reactions, then renewal is not a major hurdle. You as Principal Investigator, are responsible for determining whether the changes will affect the current status of the project. When you complete your research, the same Change/ Termination form should be completed indicating project termination. This will allow the UT Martin IRB Compliance Section to close your project files.

Please remember that it is the responsibility of the Principal Investigator to keep the data that is collected in a secure location for 3 years after the completion of the research project.

We wish you success in your research endeavors.

A handwritten signature in black ink that reads "Scott Parrott".

Scott Parrott, Ph.D.
UT Martin IRB Chair

pqf

Appendix B Survey Questions

Survey # _____

AG GENS 101 CAREER SURVEY (FALL 2013)

Age: _____ Sex: Male Female Classification: FR SO JR
SR

College Major: _____ ACT Score: _____

High School Information

1. What was the approximate number of students attending your high school?

___ Less than 500 ___ 501 – 1000 ___ 1001 – 1500 ___ Over 1500

2. Please check the following groups you participated in before attending college.

___ FFA ___ 4-H

If you participated in FFA, did it impact your decision to major in an agricultural field in college?

___ Yes ___ No

If you participated in 4-H, did it impact your decision to major in an agricultural field in college?

___ Yes ___ No

3. Did you grow up on a farm? ___ Yes ___ No

If yes, do you plan to return home to farm after graduation?

___ Yes ___ No

4. Did you take any AP (Advanced Placement) or college courses in high school?

___ Yes ___ No

If yes, what courses did you take? (Check all that apply)

___ English ___ Math ___ History ___ Economics ___ Chemistry

___ Biology ___ Physics ___ Other _____

8. Did you take any dual enrollment college credit courses during high school?

___ Yes ___ No

If yes, what courses did you take? (Check all that apply)

___ English ___ Math ___ History ___ Economics ___ Chemistry

___ Biology ___ Physics ___ Plant Science ___ Animal Science

___ Agribusiness ___ Agricultural Engineering ___ Horse Science

___ Other _____

9. How many math courses did you complete in high school? _____

10. Please check your most likely career plan? **(Check only 1)**

- | | | |
|--|---|--|
| <input type="checkbox"/> Veterinarian | <input type="checkbox"/> Veterinary Health Technician | <input type="checkbox"/> Animal Scientist |
| <input type="checkbox"/> Plant Scientist | <input type="checkbox"/> Ag Engineer | <input type="checkbox"/> Engineer |
| <input type="checkbox"/> Business Owner | <input type="checkbox"/> Teacher | <input type="checkbox"/> Ag Communications |
| <input type="checkbox"/> Farmer | <input type="checkbox"/> Agribusiness professional | <input type="checkbox"/> Landscape Designer |
| <input type="checkbox"/> Soil Scientist | <input type="checkbox"/> Banker | <input type="checkbox"/> International Company |
| <input type="checkbox"/> Other (_____) | | |

11. When did you decide on your college major?

- Junior High Freshman Sophomore Junior Senior

12. When did you make your college decision to attend UT Martin?

- Junior High Freshman Sophomore Junior Senior

13. How important are the following courses or skill areas to your success in your planned career choice? (Please check the following scale)

- 5 – Very Important 4 – Important 3 – Neutral 2- Unimportant 1 – Not necessary

Course/Concepts	Very Important	Important	Neutral	Unimportant	Not Necessary
English					
Math					
Fine Arts					
History					
Biology					
Chemistry					
Statistics					
Physics					
Geography					
Economics					
Finance					
Accounting					
Management					
Communications					
Animal Science					

How important are the following courses or skill areas to your success in your planned career choice? (Please check the following scale)

5 – Very Important 4 – Important 3 – Neutral 2- Unimportant 1 – Not necessary

Course/Concepts	Very Important	Important	Neutral	Unimportant	Not Necessary
Agribusiness					
Agricultural Engineering					
Plant science					
Soil Science					
Career Planning skills					
Public Speaking skills					
Time Management skills					
Computer skills					
Precision Agriculture					
Group skills					
Human resource management					
Conflict resolution skills					
Personal finance skills					
Foreign language skills					
International experience					

Career Information

1. Do you plan to return to your hometown when you complete your degree?
 Yes No Not sure
2. Are you willing to relocate to another state to work in your career?
 Yes No
3. Are you willing to relocate to another country to work in your career?
 Yes No
4. Would you be willing to become proficient in a foreign language in order to improve your career success?
 Yes No

5. How many foreign language courses would you be willing to take in order to increase your starting salary by 10%? **(check only 1 response)**

None 1 course 2 courses 3 courses 4 courses 5 courses

6. Good business skills are important to my career success. Yes No

7. World events will impact my career. Yes No

8. Global competition will impact my career. Yes No

9. Do you think you will work in the area you are getting your degree in?

Yes No

10. The career opportunities in agriculture are. (check only 1 response)

Excellent Good Fair Limited Not good

11. My career will allow me to make a positive influence in the world.

Yes No Neutral

12. Agriculture careers are important for our economy. Yes No

13. Do you plan to work in production agriculture upon graduation? Yes No

14. Do you plan to be employed during college? Yes No

15. Do you plan to participate in an internship related to your major during college?

Yes No

16. What factor MOST helped you in selecting your college major? **(Check ONLY 1)**

Family Guidance Counselor High School Teacher Campus Visit

Specialized career needs (ie. Veterinarian, banker, teacher, etc.) Personally

rewarding Income potential Job opportunities Friends

FFA/4-H experience