Factors Associated with the Choice of College Major in Utah

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Abstract

This study identified variables that differed between students planning to major in agriculture and students not planning to major in agriculture within the state of Utah. This information was identified as being critical to the future recruitment efforts of the College of Agriculture. Variables included in the study were taken from the 2002 ACT Assessment registration booklet that lists 177 questions in the Student Profile Section, Interest Inventory factors, and demographic information. The population of this study consisted of 18,177 students who completed the registration booklet, chose a specific college major, and went on to take the 2002 ACT Assessment in Utah. Analysis included a stepwise multiple regression with the choice of either agriculture (n = 465) or non-agriculture (n = 17,712) major as the outcome variable and the remaining Student Profile, Interest Inventory, and demographic factors as the predictor variables. Results yielded 19 variables which explained 3.3% of the variance in choice of college major. As a result of the relatively low amount of variance explained, results should be interpreted with caution. The variables could be used to target potential agriculture majors in Utah. The most critical areas to focus upon while recruiting included stressing the natural sciences, hands-on applications, and noting participation in community organizations such as FFA and 4-H. Recruiters should recruit potential agriculture majors regardless of gender, race and academic level.

Introduction

Recruitment and retention of agriculture students at the university level has been historically important. McCarthy (1992) stressed this and noted the role of funds within colleges of agriculture directed at recruiting. "Creative recruitment ideas must be developed, implemented and periodically evaluated in order to ensure long-term program enrollment stability" (p. 36). One such idea was advanced by Cole and Fanno (1999). They wrote that high school counselors should be made aware of the science-based nature of university agriculture programs.

Cole and Thompson (1999) found that gender was a significant factor to consider when recruiting agriculture majors. More women were entering Oregon State University while men were more likely to attend a community college and then transfer.

Other factors to consider when recruiting agriculture majors were FFA / 4-H involvement, recommendations from agriculture teachers & extension agents, and community size. Significantly more agriculture students came from rural areas. However, metropolitan areas should not be ignored when recruiting agriculture students.

Recruiting efforts to attract underrepresented groups should be sought by agricultural colleges (Talbert et al., 1997). Educational barriers and group perceptions lead many in these groups to pursue careers outside of agriculture. Factors found to be significant when differentiating between students who chose agriculture majors and students who chose non-agriculture majors were listed by Tarpley and Taylor (1992). By utilizing a stepwise multiple regression analysis of 1991 ACT Assessment information, the authors found that agriculture majors had lower grade point averages, came from smaller communities, received more athletic and organizational awards, took more Spanish and fewer English courses, and had higher Interest Inventory percentile ranks in Technical and lower Interest Inventory percentile ranks in Arts and Business Operations. Donnermeyer and Kreps (1994) also noted that diverse factors must be recognized by recruitment programs and found that community size was a significant factor when describing agriculture majors.

The ACT Assessment was also used by Fowler (1995) to determine differences between groups. Fowler utilized the ACT Assessment student profile section information to identify factors associated with student preference for college and university types. Additionally, the ACT Assessment was also used by Cobb (1997) to compare students who had a musical background to those without musical backgrounds.

As for the assessment itself, ACT scores tended to be good predictors of student graduation and GPA variables. ACT scores and high school GPAs are significant predictors of retention (Cambiano et al., 2000). Further, the self-reported information in the registration booklet tended to be reported accurately by students taking the test regardless of academic background (Laing et al., 1988; Ormsby & Maxey, 1972). Sawyer et al., (1989) compared the self-reported courses and grades from the ACT Assessment with their actual school records. The researchers concluded, "In general, the findings suggest that the accuracy of student reporting of

courses taken and the grades received at the time of registration for the ACT Assessment is sufficiently high to be useful in many contexts" (p. 298). Therefore, ACT information can be considered accurate in predicting group membership and the accuracy of the self-reported information can be used in research studies such as this one.

Materials and Methods

The purpose of this study was to identify factors which accounted for the variance between groups of Utah students, based on whether they planned to major in agriculture as taken from 2002 ACT Program Assessment registration information. The specific objectives of this study were to:

1. Describe Utah students who planned to major in an area of agriculture who took the 2002 ACT Program Assessment test according to gender, race, ACT composite score, and ACT sub scores; and

2. Determine which ACT Program Assessment student profile items, interest inventory classifications, and demographic variables accounted for a statistically significant amount of variance between students who planned to major in agriculture and students who planned to major in a program of study other than agriculture.

The population for this study included all students who took the 2002 ACT Assessment Program test in Utah (N = 18,177) and chose a college major during the registration process. The ACT Program Assessment is a measurement instrument which reports a composite score along with sub scores in English, mathematics, reading, and science reasoning. Students who registered for the assessment also provided demographic information, high school course and grade information as well as other information in a student profile section and interest inventory. This study utilized the information provided by the ACT Program Assessment.

The predictor variables were all responses to the student profile section, interest inventory percentile ranks, demographic information, and high school course and grade information supplied by test-takers as they completed the ACT Program Assessment registration booklet and examination. The ACT Program Assessment registration asked the students "Which college major (program of study) do you plan to enter?" Choices of college majors included 285 specific majors and a choice of undecided. From these choices, 13 were listed as agriculture majors in the registration booklet. The agriculture choices were comprised of Agricultural Sciences & Technologies (General); Agricultural Business; Agricultural Economics; Agricultural Mechanics; Agricultural Production/Technology; Agronomy; Animal Sciences; Farm and Ranch Management; Fish, Game, and Wildlife Management; Food Sciences/ Engineering; Forestry and Related Sciences; Horticulture/Ornamental Horticulture; and Natural Resources Management. Along with these choices of majors, five additional majors listed in the booklet were added to the category of agriculture majors Landscape Architecture, Agricultural Education, Agricultural Engineering, Veterinarian Assisting, and Veterinary Medicine.

The choices of college major were recoded into a dichotomous variable of: (a) Agriculture Majors (all 18 of the chosen agricultural fields of study), and (b) Non-Agriculture Majors (all other majors). The recoded variable of major was then used as the outcome variable. Data analysis consisted of descriptive statistics and a stepwise multiple regression using SPSS for Windows release 11.5.0. All significance tests were performed at the .01 level. An Alpha level of .01 was selected for this study because it was the typical level of significance employed by previous researchers utilizing similar ACT information in regression models with relatively large sample sizes (Heard & Ayers, 1988; Tarpley & Taylor, 1992; Sibert, 1989).

Results and Discussion

The first research objective sought to describe Utah agriculture majors. Of the 18,177 students who took the ACT Program Assessment in 2002 and chose a major, 465 (2.6%) chose one of the 18 listed agriculture majors. Of those students who chose agriculture majors, 56.6% were male and 43.4% were female. Further, 91.9% of the students who chose agriculture majors were Caucasian-American/White (non-Hispanic), 2.6% were Mexican-American/ Chicano/Latino, 3.7% were members of other racial/ethnic backgrounds, and 1.8% chose not to respond. Of those students who chose non-agriculture majors 45.7% were male and 54.3% were female. Also, 88.3% of the students who chose non-agriculture majors were Caucasian-American/White (non-Hispanic), 2.1% were Mexican-American/ Chicano/Latino, 2.8% were Asian-American/Pacific Islander, 4.0% were members of other racial/ethnic backgrounds, and 2.8% chose not to respond.

Overall, Utah students who took the ACT Assessment in 2002 had a mean composite score of 21.4 (SD = 4.6). Means and standard deviations for ACT composite and sub scores reported for students

Table 1 Means and Standard Deviations for ACT Scores by Major *

ACT Score	Agriculture Majors		Non-Agriculture Majors	
	M	SD	M	SD
ACT Composite	19.4	4.2	21.5	4.6
ACT English	18.2	5.4	20.8	5.6
ACT Math	18.9	4.1	20.9	4.9
ACT Reading	19.9	5.8	22.1	5.9
ACT Science Reasoning	20.0	4.0	21.6	4.4

* Note: None of the ACT Composite or Sub Scores explained a significant amount of variance of between potential agriculture and non-agriculture majors in the stepwise regression equation.

who chose agriculture and non-agriculture majors are displayed in Table 1.

The second research objective sought to determine which of the ACT Program Assessment student profile items, interest inventory classifications, and demographic variables accounted for a statistically significant amount of variance between students who planned to major in agriculture and students who planned to major in a program of study other than agriculture. At the .01 Alpha level, 19 factors entered the stepwise multiple regression equation. These 19 factors accounted for 3.3% of the variance in choice of college major (see Table 2).

Further analysis of the variables that entered the regression equation indicated that students who chose agriculture majors were more interested in advanced placement in college natural science classes, but less interested in advanced placement in social studies and mathematics classes than were those not interested in agriculture majors. The agriculture majors were also more interested in obtaining college credit by examination in natural sciences. This supports Cole and Fanno's (1999) assertion that science-based materials can be used to recruit potential agriculture students. Utah colleges that offer agriculture should develop recruitment strategies that utilize this science link. However, fewer agriculture students reported that they had received prizes or awards for scientific work or study. Also, fewer agriculture majors had taken or planned to take high school geometry classes and they received lower ACT sub scores in algebra/coordinated geometry. Agriculture majors had also taken or planned to take fewer high school computer classes.

Students who planned to major in agriculture had higher Interest Inventory percentile ranks in the areas of Technical and Science than students who did not plan to major in agriculture. This gives agriculture college recruiters further reasons to stress the "hands-on" aspects of agricultural careers. Recruitment activities should continue to illustrate this with demonstrations and pictures of agriculturists working in their chosen fields of study. The agriculture students had lower Interest Inventory percentile ranks in the areas of Arts, Business Contact, and Business Operation.

Finally, the regression analysis indicated that students planning to major in agriculture won more recognitions or awards for club or organization activities such as FFA or 4-H. These students generally came from smaller communities and were more certain of their first occupational choice in the student profile section. The agriculture majors taught in a church or synagogue, or led a religious service on a regular basis less than the non-agriculture majors. Also, more agriculture majors held a full-time, paying job during the summer. Finally, the variable of college type preference indicated a statistically significant difference between the groups. Further analysis indicated that the students who chose agriculture majors tended to prefer public 2-year community or junior colleges more while students who chose non-agriculture majors preferred private 2-year colleges more.

Summary

Results from this study indicated that students in Utah who plan to major in agriculture tend to have an interest in natural science. They are more interested in univer-

Table 2 Stepwise Multiple Regression Analysis of Factors Concerning the Choice of Major

Factor	Beta	t^x
Interested in advanced placement in natural sciences	.048	4.955***
Won recognition or an award for a club or organization activity (FFA, FHA, 4-H, Scouting, etc.)	.059	7.691***
Interested in advanced placement in social studies	-.035	-4.226***
Community size	-.037	-4.982***
Algebra Coordinated Geometry Standard SubScore	-.059	-7.113***
Certainty of first occupational choice	.040	5.434***
Interest Inventory Technical	.112	8.450***
Interest Inventory Arts	-.107	-8.824***
Interest Inventory Business Contact	-.041	-3.236***
Interest Inventory Science	.075	5.821***
Taught in a church or synagogue on a regular basis	-.030	-3.912***
Interested in advanced placement in mathematics	-.027	-3.111**
Interested in obtaining credit by examination in natural sciences	.030	3.446***
Has taken or planned to take high school computer class	-.024	-3.319***
Has taken or planned to take high school geometry class	-.024	-3.178***
Interest Inventory Business Operation	-.038	-2.792**
Won a prize or award (of any kind) for scientific work or study	-.022	-2.928**
College type preference	-.019	-2.605**
Held a full-time, paying job during the summer	.019	2.589**

^{x} $F_{(19, 18,157)} = 33.013$ Multiple $R = .183$
** Significant at the .01 level.
*** Significant at the .001 level.

sity advanced placement, have a higher science Interest Inventory score, and expect to obtain credit by examination when they reach the university. Even though more males selected an agriculture major than did females, gender was not found to be a significant indicator of choice of major. However, community size was found to be a significant indicator.

Utah students who planned to major in agriculture had higher Interest Inventory scores in technical areas and lower interest inventory scores in arts and business. Students planning to major in agriculture tended to have paying summer jobs. They were also more confident in their choice of occupation. Further, Utah agriculture students tended to prefer public colleges over private colleges. Additionally, it is perhaps not surprising to find that potential agriculture majors have received more organizational awards from groups like FFA and 4-H. Also, students who chose agriculture majors tended to teach or lead religious services less than other students.

Also of importance in this study were the factors that were not found to significantly differentiate agriculture from non-agriculture majors. None of the demographic variables described in research objective one were found to be significant in the regression model. It should be noted that the ACT English sub score was the first variable chosen by the stepwise regression equation when explaining the differences. However, the variable dropped out of the equation after the tenth step. No other variables were dropped from the equation. After factoring in the other variables, ACT scores did not explain differences between potential agriculture and non-agriculture majors.

This study found significant results when utilizing ACT Assessment information. However, accounting for only 3.3% of the variation between the groups leaves much more research to be completed. One reason for the relatively low amount of variance explained is that factors previously associated with the choice of major by agriculture students are simply not measured by the ACT Assessment registration information.

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