Identification and Analysis of Characteristics of Associate Degree Agricultural Students

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In 1970, the Carnegie Foundation noted that the most recent structural development in higher education has been the phenomenal growth in the community college. The curriculum at a community college typically has two objectives, one which serves as a transfer curriculum that is linked to a four year university and/or a vocational curriculum that usually results in the an associate degree and/or certificate.

The enrollment growth in community colleges parallels the current employment demand of business and industry. Employment trends for the next decade show that three-quarters of the jobs in the United States will require some form of post-secondary education and the majority of those jobs will require educational preparation of that less than a baccalaureate degree (Parnell, 1990). Hansen also noted that the training received by these individuals was delivered by an educational agency beyond the high school level. This need for technical based education has supported higher enrollment rates in community colleges. Additionally, a growing number of students who already hold a four year degree are enrolling in associate programs for vocational/technical training (Koltai, 1988).

Education has responded to this industry by the development and passage of the 1984 and 1990 Carl Perkins Vocational Education acts. This legislation provided funds for the development and implementation of articulation agreements between secondary vocational programs and two year post secondary programs that cumulate in an associate degree and/or certificate.

Approximately 558 colleges/universities in the United States offer two-year degree programs at the post secondary level in some field of agriculture, food and/or the natural resource sciences (Office of Vocational and Adult Education, 1995). Agriculture is also seeking individuals with a technical education beyond the secondary level. As post-secondary institutions seek to meet the need of industry several questions arise. What criteria are being used to accept individuals into associate degree programs? What factors are useful to predict student success in an associate program?

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Three traditional criteria are used for acceptance into institutions of higher learning, they are, an above average high school grade point average; a class rank in the upper 25%; and, an above average score on the SAT or ACT (Boyer, 1987; Rosen, Brunner & Fowler 1973). These three criteria have been used with varying degrees of success for predicting an individuals ability to earn a baccalaureate degree. However, little research has focused on the specific characteristics of an associate program and the criteria that related to preparation for and success in such a program. In order to meet the demands for competent and qualified employees those institutions that offer associate degrees need to determine factors that can be used to recruit, prepare and successfully graduate students from their institutions.

Purpose and Objectives

The purpose of this study was to identify characteristics related to academic performance, of students enrolled in the Agriculture Technology program at the College of Agriculture at Virginia Tech. The specific objectives of the study were to: 1. describe the population of students in the Agriculture Technology program based on selected demographic variables, 2. compare selected demographic variables of Agriculture Technology students with baccalaureate degree seeking students in the College of Agriculture and, 3. determine if significant relationships exist between selected demographic variables of Agriculture Technology students and their Virginia Tech cumulative grade point average.

Methods and Procedures

The population for this study consisted of 223 former students of the Agriculture Technology program at Virginia Tech (Total enrolled since the program's inception in 1990). A random sample of 150 students was taken for the study (Krejcie & Morgan, 1970). There were 117 usable student records from the sample selected. Bachelor degree student comparisons came from the same time frame. Since data collection procedures for Agriculture Technology students and the baccalaureate students differed, statistical comparison was not appropriate.

The students application, letters of reference, high school transcripts, college entrance test scores, and university transcripts were used in the data collection process. The level of

academic performance was defined as the cumulative GPA attained at Virginia Tech.

High school activity scores were calculated by counting the number of years students were involved in activities listed on their application for admission. For example, a student who was a member of FFA for four years, played three years of varsity sports, and was a member of the French club for two years would receive a score of nine. The high school curriculum score was calculated by adding the total number of credits earned on the high school transcript deemed to be college preparatory by Virginia Tech admission standards.

Findings

Objective 1

The population of students in the Agricultural Technology program at Virginia Tech had both similarities and marked differences with students enrolled in the Bachelor of Science degree program. Major differences existed in gender, SAT scores, and high school rank. Agriculture Technology students consisted of 84.5% males and 15.5% females while the student body in the College of Agriculture bachelor degree program was 54% male and 46% female. The mean SAT score for Agriculture Technology students was 806 while the mean score for baccalaureate students was 1060. Finally, the BS degree seeking students in the College of Agriculture were in the top 16% of their high school graduating class while the Agriculture Technology students were, on average at the 50th percentile (Table 1).

Twenty-nine percent of the Agriculture Technology students transferred from other colleges and universities while 23% of the baccalaureate students in the college of agriculture were transfers. Ninety-three percent of the Agriculture Technology students had agriculture experience before entering the program (data not available for baccalaureate students). The graduation rate for Agriculture Technology students was 72% while baccalaureate students at Virginia Tech had a graduation rate of 67%.

The average student entering the Agriculture Technology program was 20.4 years old, while the average student in the College of Agriculture (freshman - senior) was 20 years old. Students entered the Agriculture Technology program with an average high school GPA of 2.47 (on a four point scale). Bachelor degree seeking students entered the College with high school GPAs over 3.0.

Agriculture Technology students were in the top half of their high school class, while four year College of Agriculture students came from the top 16% of their high school class. The Agriculture Technology students had a mean score of 13.4 on high school activities and a mean of 9.3 on the high school curriculum. High school activities and high school curriculum data were not available for baccalaureate degree seeking students. Seventy two percent of the students who entered the Agriculture Technology completed the program in five semesters with a 2.52 GPA. College of Agriculture seniors graduated with a 2.75 GPA.

Table 1. Characteristics of Agriculture Technology Students at Virginia Polytechnic Institute and State University.

Variable	Mean	SD	%
SAT Composite	806	155	
High School GPA	2.47	.47	
High School Activities	13.4	9	
High School Curriculum	9.3	3.3	
Semesters	5	.3	
VT GPA	2.52	.88	
Age at Enrollment	20.4	4.8	
Gender			
Male			84.5
Transfer			
Yes			29
Agricultural Experience			
Yes			93
Graduation Rate			72

Objective 2

Multiple regression analysis was run with the dependent variable, Virginia Tech final GPA, and independent variables, SAT score, high school GPA, high school activities, high school curriculum, high school class rank, gender, age, transfer status and agricultural experience. In the multiple regression analysis only one variable, high school GPA was found to be significant in predicting academic performance for Agriculture Technology students. High school GPA had a t-value of 3.47 with an alpha level of less than .05. High school GPA accounted for 17% of the variance in the final GPA at Virginia Tech (r=.41)

Conclusions

1. Agriculture Technology students enter the program with less academic preparation than do students in bachelor degree seeking programs.
2. Agriculture Technology students have been involved in many high school activities.
3. Agriculture Technology students have taken fewer than 10 credits of college preparatory, high school course work.
4. Agriculture Technology students are primarily male.
5. Agriculture Technology students tend to be older than bachelor degree seeking students in the College of Agriculture.
6. High school GPA has a moderately strong, positive correlation with the GPA attained in the Agriculture Technology program at Virginia Tech.
7. Agriculture Technology students may be better prepared for social, interpersonal, and leadership activities based on their delayed college entrance.

Recommendations

1. Agriculture technology students may need more academic nurturing when they enter the program. Counseling could be very important in fostering academic success.
2. Effort needs to be exerted to diversify the student population through recruitment.
3. Students entering the program later in life than traditional college freshmen may have special needs to be addressed.
4. Although high school GPA is a good predictor of performance in the Agriculture Technology program, more research is needed in this area.

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BOOK REVIEWS

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Rodney B. Harrington. *Animal Breeding, An Introduction.* Danville, IL: Interstate Publishers, Inc., 1995. 221 pages. Paperbound $27.95.

The author has attempted to write this book so that no knowledge of mathematics or biology is assumed beyond what would be obtained in a typical high curriculum. It is simply written and reasonably brief.

Content of the Book

The book is divided into three parts. The first four chapters deal with basic principles of genetics including gene segregation, one and two pair crosses, and probability. The first chapter presents an introduction and history of animal breeding. The second and third chapters deal with several types of gene action and inheritance. Included are dominant, epistatic, and additive gene actions; along with sex-related inheritance, multiple alleles, incomplete dominance, and lethal genes. Concepts of probability are introduced in chapter four.

The second part of the book presents concepts, methods, and techniques of selection, and mating systems including inbreeding and outbreeding. Chapter five includes a presentation of natural and artificial selection. Chapter six covers heritability estimates and EPD's and how they are used to improve a single trait. Identifying genetically superior animals is the subject of chapter seven, including progeny and performance testing. The importance and uses of selection indexes is included in chapter eight. Positive and negative assortive mating, inbreeding, and outbreeding are presented in chapter nine.

Part three of the book takes up over one-half of the book. It is divided into individual chapters for each species (dairy cattle, beef cattle, swine, sheep, and horses).

Evaluation of the Book

The simplicity of the book is a plus for students in an introductory course in animal breeding. However, although it does not detract from the general thrust of the test, I doubt if students without some basic statistics would be able to understand much about the use of the animal model and BLUP.

The appendix section at the end of the book includes a glossary of genetic terms which is very helpful.

My major criticism of the book has to do not with what it contains, but with what is left out. It is my opinion that a textbook should also act as a study guide. It would be so helpful to have study questions and problems at the end of each chapter with solutions included.

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