
GRADUATE STUDENT SELECTION IN AGRICULTURAL EDUCATION

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Introduction

A continuing concern of agricultural education departments is admission and selection procedures for prospective graduate students. Several methods are common. The most common are examination of undergraduate grades, using testing procedures or some combination of the two above.

If rigid guidelines are used by a particular university, it relieves the pressure for the individual agricultural education department. However, GPA requirements or test scores alone might eliminate students that might be quite capable of performing graduate level work. It is not unusual within the profession to hear of students not acceptable in one university's graduate school that entered other universities and were quite successful. Rigid procedures do not take into account the "late bloomers" or those who academically mature late. They also do not take into account or measure unique intellectual abilities that might be found among agricultural education graduate students.

The College of Education of the University of Minnesota has used a battery of standardized tests to select graduate students for a number of years. These tests include the Miller Analogies, Cooperative English Test, Cooperative Mathematics and the Education Information Test. To qualify for the candidacy for the master's degree, students need to score in the 15th percentile in three out of four tests. There was no cut-off for the Ph.D. However, a prospective Ph.D. student was expected to show strength in the entire battery.

Prospective graduate students in agricultural education seldom had problems scoring well in two out of the four tests. However, there were continuing problems with scoring on the Cooperative English Test and the Education Information Test. The staff of the Department of Agricultural Education decided to examine the entire test battery to determine its efficacy for agricultural education graduate students.

Design of Study and Analysis of Data

A complete set of files including graduate test battery scores since 1950 are maintained in the Agricultural Education Department. A total of 285 complete records were found. Raw scores on each of the tests in the battery were gathered for each student as well as total number of credit hours attempted, grade points earned, cumulative grade point average and graduate degrees earned at the University of Minnesota.

The data were analyzed with multiple regression and descriptive techniques using the UMSTAT 50 and UMSTAT 60 programs of the Numerical Analysis Center of the University. Program descriptions appear in UMSTAT Computer Programs Manual available at the University of Minnesota Bookstore.

Grade point average was the dependent variable in the regression section with the raw scores of the Miller Analogies, Education Information, Cooperative English Test and the Cooperative Mathematics Test as independent variables. The analysis was performed in the following groupings with the number of students involved in parenthesis:

1. All agricultural education graduate students (285).
2. University of Minnesota B.S. graduates in Agricultural Education (211).

3. Graduates of other universities (74).
4. All Ph.D. recipients (25).
5. All M.A. or M.S. recipients (116).
6. All graduate students not completing degree programs (144).
7. Ph.D. recipients with a Minnesota B.S. degree (12).
8. Ph.D. Recipients with B.S. degrees from other institutions (13).
9. M.A. or M.S. recipients with a Minnesota B.S. degree (89).
10. M.A. or M.S. recipients with B.S. degrees from other institutions (27).
11. Students with a Minnesota B.S. degree not recipients of a graduate degree (110).
12. Students with a B.S. degree from other institutions not recipients of a graduate degree.

For the group as a whole and for each subgroup, multiple regression equations, means, medians variances, standard deviations, frequency distributions, correlation coefficients and multiple correlation coefficients were computed.

Findings

The agricultural education graduate student performed at relatively high levels of grade point with a means of 3.40 and only 6% (18) did not achieve a 3.0 average. All tests in the graduate battery correlated at the .01 level with GPA as can be seen in Table I.

TABLE I

Multiple Correlation Coefficients with Grade Point Averages as the Department Variable for 285 Agricultural Education Graduate Test Battery Scores.

Variables Included	Miller Analogies	Education Information	Coop. Math	Coop. English	R ²	R
1	X				.03	.18**
2		X			.03	.17**
3			X		.05	.22**
4				X	.06	.25**
1,2	X	X			.04	.20**
1,3	X		X		.05	.22**
1,4	X			X	.06	.25**
2,3		X	X		.06	.24**
2,4		X		X	.07	.26**
3,4			X	X	.07	.27**
1,2,3	X	X	X		.06	.24**
1,3,4	X	X		X	.07	.26**
2,3,4		X	X	X	.07	.27**
1,2,3,4	X	X	X	X	.08	.28**

** = .01 level of significance

It should be noted that even though the correlations were all significant--that the R^2 or percent of variation explained by these tests was only 8% when all 4 were included. This author was more concerned with what the investigation did not show since 92% of the variation in GPA was not explained.

The predictive ability of the test battery was found to be quite good for Ph. D. recipients with a R of .51 (significant at the .01 level) and a R^2 of .26 while both the master's recipients and non degree recipients had R 's of .28 (significant at the .01 level) and R^2 of .08. This indicates that the test battery seems to be measuring traits and abilities that Ph. D. recipients are more likely to have or that existing selection procedures had effectively eliminated all that did not perform well on the examinations.

A problem inherent in this type of investigation is the use of GPA as a dependent variable where there is essentially a small range of grades available, i.e., 3.0 - 4.0 in most cases with any others eliminated from consideration. Another problem is the dual grading system found at the University of Minnesota--the Satisfactory-Unsatisfactory as well as the A-F grading system. This is a departmental option and in some cases a professor's option. Seminars are typically S-U but not always. Therefore, there was the problem of computing values for a Satisfactory grade. This investigation computed the grade as B as does the University for grade point averages. This places some students at a disadvantage since they may have taken courses in departments that use the S-U system of grading for most courses.

The descriptive analysis of data was quite illuminating because the agricultural education graduate students had a mean raw score in the Miller Analogies that was at the 48th percentile in the College of Education norms and a mean score in the Cooperative Mathematics Test that was at the 58th percentile in the norms. The same strength was not found in the Cooperative English Test or the Education Information Test where the mean scores fell in the 21st and the 28th percentiles respectively.

The Minnesota graduate student in agricultural education performed at expected levels in the Miller Analogies, above expected levels in the Cooperative Mathematics and below expected levels in the Cooperative English and the Education Information Tests when compared to other graduate students in the College of Education.

The results show individuals of close to average ability who perform extremely well in mathematics but perform at subnormal levels in education and English. One might assume that the inadequacies that appear might be attributed to a lack of correlation among the priorities reflected in the requirements of undergraduate programs in agricultural education as compared to some other curriculum that results in high test scores.

The survey of literature indicated another possibility; that men of rural background normally score lower on verbal tests than their

academic performance would indicate. Albert Hood reported in the Personnel and Guidance Journal of April, 1967, that youth of rural background achieved .2 of a grade point higher than the Minnesota testing equations would have predicted for all Minnesota colleges.

It is not in the province of this investigation to speculate upon the reasons that rural men do not score well on standardized tests other than to suggest that cultural biases or inadequate preparation might be profitable areas for further investigation.

Assuming that background inadequacies affect the performance in the education and English tests, questions arise to what ends are these tests used. If the test scores are used to identify minimum levels of competencies that is one thing, but if they are used to predict the ability of a student to do graduate work it raises another question. The battery under examination contains one ability test (Miller Analogies) and three achievement tests. The data in this investigation indicated that even the Miller Analogies did not perform particularly well in predicting success.

If the test battery was to measure certain minimum levels of achievement, there is a definite need to reassess undergraduate agricultural education curriculums and/or institute remedial training for prospective graduate students. This has particular relevance since the University of Minnesota is the only institution in Minnesota offering graduate courses and conferring graduate degrees in agricultural education.

The problems raised in this investigation concerning graduate student selection are found in most departments of agricultural education. The primary mission of the agricultural education departments is to train teachers. However, departments also have, in most cases, the responsibility for inservice training, professional improvement through graduate programs and the responsibility for contributions to the profession through research and writing. It is often difficult to separate the service function from the academic function of graduate degree training. Although it is possible to combine these in some cases, some departments have needed to build divisions between inservice education and graduate study.

Since this research was carried out, the University of Minnesota has modified their entrance criteria for graduate study in education. The results of this study indicate that information other than tests alone should be incorporated for graduate student selection.

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