

**Are the More Academically Able Agriculture Teacher Candidates
Not Entering or Remaining in the Teaching Profession?**

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The quality of education provided by public schools in America has been under considerable scrutiny in recent years. In his report to the public entitled, A Nation at Risk, Gardner (1983) suggested that today's beginning teachers are not as well qualified as those who previously entered teaching. Studies by Schlecty and Vance (1981) and Weaver (1984) suggested that the academic ability and/or quality of those choosing to enter and remain in teaching was on the decline.

The quality of agricultural education in the nation's secondary schools has also been under scrutiny. The National Research Council established the Committee on Agricultural Education in Secondary Schools. The committee's final report, Understanding Agriculture: New Directions for Education (National Academy Press, 1988), made specific recommendations to reform secondary school agricultural education programs. Among the recommendations were: ". . . securing more competent teachers" (p. 34). The report further stated: ". . . quality teachers are the critical ingredient for quality programs" (p. 34).

As the concern for quality education continues, some disagreement still remains as to valid predictors or measures of teaching ability. Wilson (1985) cited studies that suggested there is a relationship between teachers' academic abilities and students' achievements. Olstad et al. (1987) suggested that: "While it [academic competency] may not be predictive of competence in teaching performance, perhaps it is a critical, minimum standard which all prospective teachers should meet. . ." (p. 100). Sweeney (1987) stated that:

While the possible negative effect on student achievement resulting from decline in quality of those entering and remaining in teaching is a major concern, the public relations problem that this creates for the teaching profession and the possible effect on the quality and quantity of those recruited into and retained in the profession is equally troublesome (p. 2).

In recent years, considerable data have been collected in an attempt to determine the quality of teachers entering and remaining in the teaching profession (e.g., Schlecty & Vance, 1981; McCoy & Mortensen, 1983; Weaver, 1984; Pigge, 1985; Wardlow, 1986). All studies have used some measure of academic ability to ascertain the quality or potential quality of the teacher education graduate. Schlecty and Vance (1981) stated that:

. . . interest in [teacher's] academic ability stemmed from the generally accepted fact that persons who score well on measures of academic ability have educational and job opportunities available to them that are usually denied to those who score poorly. Thus it seemed reasonable to expect that teachers who scored well on measures of academic ability would be more likely to opt out of teaching than their lower scoring colleagues (p. 107).

Purpose and Objectives

It is evident that an upswing in the agricultural economy, coupled with developments in agricultural science and technology, has made many new jobs in business and industry available to agricultural education graduates at very competitive salaries. Camp and Echeverria (1989) reported that the percentage of agricultural education graduates entering agricultural business occupations nationally increased from 13.8 percent in 1979-80 to 20.1 percent in 1987-88. That compared with 33.3 percent and 42.8 percent for Iowa during the same time periods.

The purpose of this study was to analyze the characteristics of the recent Agricultural Education graduates at Iowa State University completing a B.S. degree and their perceptions concerning the Teacher Education Program. The objectives for the study were to:

Compare the academic ability of those graduates from 1980-1989 who planned to teach, those not planning to teach at time of graduation, and those who were actually teaching or not teaching one and five years after graduation.

Identify factors most influential in differentiating between graduates who entered the teaching field and those who did not.

Procedures

The population for this research project consisted of graduates of the Iowa State University Teacher Preparation Program who certified in the area of vocational agriculture from Spring 1980 through Spring 1989. The total number of graduates who certified to teach in this period was 294, which was the population for the study.

The primary data for this study were obtained from a data base that was part of a comprehensive ongoing research project conducted by the Research Institute for Studies in Education (RISE) at Iowa State University. The research project followed the longitudinal survey-cohort studies design (Borg & Gall, 1983) in which a specific population was followed over a period of time. It was designed for collection of data from the total population of teacher education students and graduates at major points in their preparation and careers. Collection points for purposes of this study included: 1) time of admission to the teacher education program; 2) graduation from the teacher education program; 3) one year after graduation; and 4) five years after graduation. Data collected provided information about attitudes, teacher competencies, personal characteristics, and planned and actual career paths.

Three survey instruments developed by RISE personnel were used to collect the data. Instruments were validated and field tested before use. Cronbach's alpha reliability coefficients were computed and ranged from .63 to .94. The scores were judged to be satisfactory. Data were collected by mail, and follow-up procedures were used. Response rates were 55.1 percent at graduation, 48.0 percent one year after graduation, and 49.7 percent five years after graduation.

Data were analyzed by using the Statistical Package for the Social Sciences (SPSSx). Statistical procedures included T-TEST, ONEWAY, ANOVA, CORRELATIONS, DISCRIMINANT, and CHI-SQUARE. The level of significance for all procedures was set a priori at the .05 level.

Four measures of academic ability: high school ranking (HSR), American College Test scores (ACT), grade point averages at time of admittance to Teacher Education Program (AGPA), and grade point averages at time of graduation from the Teacher Education Program (GGPA) were available for all graduates from their permanent record cards. Because of the less-than-desirable response rate, appropriate coding procedures and statistical analysis were used to first compare respondents and nonrespondents on the four measures of academic ability to help remove nonresponse bias. No significant differences were found.

Results

The first objective was to compare the academic ability of graduates from 1980-1989, who were or were not planning to teach at the time of graduation and of those actually teaching and not teaching one and five years after graduation. As shown in Table 1, there were no significant differences among the three groups when divided by years of graduation on any of the four measures of academic ability. Table 2 contains data from graduates who planned to teach and those who did not at the time of graduation. Graduates who were unavailable for employment were not included in this analysis. As shown, there were no significant differences between the groups on the four measures of academic ability.

Table 1. Comparison of graduates between 1980 and 1989 on four measures of academic ability

Measure ^a /Sample	N	Mean	SD	F	F-prob.
ACT					
Grad. - 80-83	62	23.73	3.77	1.97	.144
Grad. - 84-86	39	22.10	4.39		
Grad. - 87-89	21	23.38	4.18		
GGPA					
Grad. - 80-83	84	2.91	.36	2.42	.092
Grad. - 84-86	49	2.92	.39		
Grad. - 87-89	29	3.09	.47		
AGPA					
Grad. - 80-83	41	2.79	.49	2.03	.137
Grad. - 84-86	49	2.69	.46		
Grad. - 87-89	29	2.92	.52		
HSR					
Grad. - 80-83	68	23.57	17.91	1.73	.181
Grad. - 84-86	40	29.95	19.01		
Grad. - 87-89	23	29.43	22.24		

^aACT = American Collegiate Test Score; GGPA = Grade point average at graduation; AGPA = Grade point average at admission to teacher education; HSR = Rank in high school graduating class.

Table 2. Comparison of graduates who planned to teach and those not on measures of academic ability at graduation.

Measure/Group	N	Mean	SD	T-value	Two-tail prob.
ACT					
Plan to teach	61	23.59	3.86	1.16	.248
Plan not to teach	54	22.72	4.11		
GGPA					
Plan to teach	83	2.88	.36	-1.84	.068
Plan not to teach	71	2.99	.42		
AGPA					
Plan to teach	56	2.72	.43	-1.40	.163
Plan not to teach	55	2.81	.52		
HSR					
Plan to teach	65	29.77	20.38	1.85	.066
Plan not to teach	58	23.40	17.38		

Presented in Table 3 are data from graduates one year after graduation. Only one significant difference emerged. Graduates not teaching one year after graduation had a significantly higher GPA at time of admission to the teacher education program (AGPA) than did teachers. At one year after graduation, no significant difference was found between the two groups on ACT, GGPA, or HSR. As shown in Table 4, no significant difference was found between the two groups at five years after graduation on any of the four measures of academic ability.

Table 3. Comparison of teachers and nonteachers on measures of academic ability one year after graduation.

Measure/Group	N	Mean	SD	T-value	Two-tail prob.
ACT					
Teachers	60	23.43	3.80	.26	.780
Nonteachers	51	23.24	4.26		
GGPA					
Teachers	76	2.90	.35	-1.56	.121
Nonteachers	65	3.00	.42		
AGPA					
Teachers	76	2.66	.40	-2.02	.045*
Nonteachers	65	2.81	.48		
HSR					
Teachers	65	25.96	18.24	1.01	.313
Nonteachers	53	22.58	17.62		

*p<.05.

The second objective of the study was to identify factors most influential in differentiating between the graduates who entered the teaching field and those who did not. Presented in Table 5 is a list of 18 predictor variables used in the discriminant analysis function. Three were related to academic ability; four were composite scores in areas of the

Table 4. Comparison of teachers and nonteachers on measures of academic ability five years after graduation.

Measure/Group	N	Mean	SD	T-value	Two-tail prob.
ACT					
Teachers	23	24.22	3.91	1.08	.287
Nonteachers	51	23.06	4.46		
GGPA					
Teachers	31	2.94	.31	.07	.942
Nonteachers	64	2.94	.44		
AGPA					
Teachers	31	2.71	.34	.51	.508
Nonteachers	64	2.77	.50		
NSR					
Teachers	27	21.81	17.35	-.46	.65
Nonteachers	54	23.74	18.20		

adequacy of graduates' professional teacher preparation; six were factors of importance to them in accepting their current job; four were related to the opportunities their current job provided; and the final factor was graduates' response to "would you prepare to be a teacher again." DISCRIMINANT calculated a discriminant function that best distinguished

Table 5. Factors most influential in differentiating between teachers and nonteachers one year after graduation.

Factor	Discriminant correlation coefficient (r)
Extent current job provides prestige, money, benefits, and advancement	.4500
Importance of salary offered	.3052
Importance of reputation of organization	.3027
Test and evaluate students	.2508
Plan and deliver instruction	.2210
GGPA	
Interpersonal relationships	.2038
Importance of location of job	-.1812
Importance - liked people in interview	.1476
HSR	
Extent current job provides opportunities for challenge and to exercise leadership	.1245
Extent current job provides opportunities to help and serve others and work with people vs. things	-.1097
Importance of size of organization	.0949
Assess and deal with learning problems	.0900
Extent current job provides opportunities to be creative and use abilities and aptitudes	-.0741
ACT	
Would you prepare to be a teacher again	-.0544
Importance of type of position	.0529

between the criterion variables (teachers and nonteachers) by using the combined effect of the mean scores of all predictor variables. The difference in the mean scores of the function for each group was tested by using Wilks' Lambda, and a significant difference was found (Wilks' Lambda = .5465; significance = .0004).

Also presented in Table 5 are the correlation coefficients (in rank order) that describe the relationship between each predictor variable and the discriminating function. Koenker (1971) suggested the following rule of thumb for the degree of relationship between variables: .80 to 1.00, highly related; .60 to .79, moderate to marked relationship; .40 to .59, fair degree of relationship; .20 to .39, slight; and .00 to .19, only a negligible or no relationship. As shown, graduates' rating of the extent to which the current job provided prestige, money, benefits, and chances for advancement; importance of salary offered; and importance of reputation of the organization were the predictor variables having the highest degree of relationship. They were most influential in the discriminate function that differentiated between those who were teaching and those not teaching one year after graduation. The variables related to academic ability and adequacy of teacher preparation had only a slight relationship.

The DISCRIMINANT procedure also was used to classify each graduate included in the original discriminant analysis, on the basis of the individual's discriminant score. This classification was then compared with graduate's actual classification. As shown in Table 6, the discriminant function equation was able to accurately classify 81.40 percent of the individuals.

Table 6. Discriminant analysis classification results for one year after graduation.

Actual group	No. of individuals	Predicted group Membership ^a	
		Teachers	Nonteachers
Teachers	52	43 82.7%	9 17.3%
Nonteachers	34	7 20.6%	27 79.4%

^aPercentage of grouped individuals correctly classified = 81.40%.

Conclusions

Based on the results and findings of this study, the following conclusions were drawn. There are no appreciable differences in the academic abilities of Iowa State University agricultural education graduates. The study found no significant declines in the academic ability of the students who graduated between 1980 and 1989, when grouped by years of graduation. With graduates teaching after one year, only one significant difference emerged. The group mean GPA at the time they were admitted to the teacher education program (AGPA) was significantly higher for the group not teaching after one year. No significant differences in GGPA, HSR, or ACT were shown between those teaching and those not teaching after one year. The study found no significant differences in AGPA, GGPA, HSR, or ACT between teachers and nonteachers five years after graduation. According to these findings, those graduates who chose to teach agriculture are just as academically able as their fellow graduates who seek other types of employment.

These findings concur with similar studies in agricultural education by McCoy and Mortensen (1983) and Wardlow (1986). This research is in conflict with the findings of Schlecty and Vance (1981, 1982), who assert that potential teachers and practicing teachers who score the highest on measures of academic ability are drawn away from the teaching profession. The Schlecty and Vance (1981, 1982) studies were based on samples of teachers in several different subject areas of teacher certification.

Although cause and effect are not implied, individual differences on measures of academic ability or adequacy of preparation in professional teacher education do not significantly contribute to the discriminate function equations that differentiate between graduates who are teaching and those not teaching one year after graduation. Graduates who chose not to teach seemed to be drawn to other occupations, seeking greater extrinsic rewards, personal goals, advancement opportunities, and higher salaries.

Some previous studies that included several areas of education concluded that there is a decline in the academic ability of those choosing to enter or remain in teaching. Contrary to these studies, it appears that in the case of agricultural education in Iowa, high academic ability graduates are just as likely to enter and remain in teaching.

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