

Influence of Selected Experiences on Perceived Levels of Competence of Secondary Vocational Agriculture Teachers

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Competence in one's professional work role is important in the overall learning process. Ready (1967) described competence as a motivational factor that is responsible for individual achievement. However, results of numerous studies reveal that vocational agriculture teachers are experiencing difficulties in the performance of several professional activities. Parrington (1981) reported that activities involving adult education, supervised occupational experience programs, classroom teaching, advising FPA, and program administration were the main sources of problems for teachers. Also, other studies (King & Miller, 1985; Sunderhaus & Miller, 1985, and Amberson & Bishop, 1982) identified additional problems associated with the performance of professional activities of both beginning and experienced high school vocational agriculture teachers.

Therefore, the theoretical framework for this study was synthesized around the premise that the basic procedure in program design begins with the identification of: (a) a number of tasks which are relatively distinct from each other; and, (b) those factors which impact the successful performance of those tasks (Porter, Lawer & Hackman, 1975).

When seeking to assess competencies relative to a particular position, some parameters should be placed around the role aspect of the position and the philosophy and beliefs of those who will implement such roles. Santopolo and Johnson (1970) described this as role expectation. Sarbin (1954) emphasized that a person cannot enact a role for which one lacks the necessary role expectation.

Hertling (1974) assumed that required competencies can be identified and an educational program can be conceived which will enable the participants to develop those competencies. He further contended that competency-based education programs must be developed on the basis that subsequent professional development will be enhanced, and that competency attainment must be the overall objective of such programs.

This study was based on the assumption that selected experiences of secondary vocational agriculture teachers are related to their perceived levels of competence. Results of the study can provide valuable data that may be used for the improvement of both the agricultural education preservice and inservice teacher education programs, and as a basis for further study.

Purpose and Objectives

The purpose was to determine if significant differences existed between selected experiences of secondary vocational agriculture teachers in Alabama, Florida, and Georgia and their perceived levels of competence in selected professional agricultural education activity areas. Specific objectives were:

1. To identify a demographic profile of secondary vocational agriculture education teachers in Alabama, Florida, and Georgia.

2. To determine if significant differences existed in perceived levels of competence reported by teachers in each of seven professional agricultural activity areas with respect to: (a) number of years completed in high school vocational agriculture; (b) participation in high school FFA; (c) number of certifications in teaching fields other than agriculture; (d) academic qualifications; and (e) years experience in teaching high school agriculture.

Methodology

The research method was ex post facto. The population ($N = 1120$) consisted of all high school vocational agriculture education teachers in Alabama, Florida, and Georgia, as determined by the Agriculture Teachers' Directories for the respective states. A formula, which took into account the desired levels of confidence and accuracy in the results, was utilized to determine the sample size ($N = 560$) (Krejcie & Morgan, 1970).

A two-part modified questionnaire (Rawls & Fatunsin, 1985) was adapted, pilot tested, and used to collect data pertaining to the objectives formulated. Part I contained 9 selected demographic variables, and Part II consisted of 50 professional agricultural education activities, divided into seven areas, based on factor analysis technique with varimax rotations. The factors and number of items in each factor were: (a) program planning, 13; (b) leadership skills, 8; (c) guidance and counseling, 8; (d) teaching techniques, 9; (e) occupational experience, 7; (f) adult education, 4; and, (g) school and community relations, 4. Reliability coefficients (alpha) for each factor ranged from .78 for the adult education to .94 for program planning.

The final questionnaire was compiled in booklet form and mailed to a random sample of 560 high school teachers in the three southern states. Each questionnaire, accompanied by a cover letter and a self-addressed return envelope, was mailed to teachers at their respective high schools. A postcard follow-up reminder was mailed 10 days later; a follow-up letter containing replacement questionnaires was mailed three weeks after the initial mailing. The teachers were asked to indicate on a rating scale of 1 to 5 their perceived levels of competence in each of 50 professional agriculture education activities. The scale ranged from 1 = None; 2 = Low; 3 = Medium; 4 = High; to 5 = Very High level of competence.

Three hundred forty-one questionnaires were returned with 17 having incomplete data. This left 324 usable questionnaires. After adjusting the sample size ($N = 560$) downward to 543 for unusable returns, the adjusted usable return rate was 59.6%. Lin (1976) reported that a 50% response rate is normal for questionnaire surveys and that this return is adequate for drawing inferences from the data. A nonresponse bias procedure, the early/late response approach as described by Goode and Hatt (1952), was used to determine nonresponse bias. Results indicated no significant difference between early and late respondents.

After the underlying areas were isolated by factor analysis, multivariate analysis of variance (MANOVA), with selective procedures for number of years in high school vocational agriculture and number of certifications in teaching fields other than agriculture, was used to test for significance. Weighted scores were used as multiple dependent variables,

and the demographic data were used as multiple independent variables. If a response had missing data on any item, the factor score was eliminated from the analysis. Six cases were lost in this procedure, lowering the total number of valid cases to 318.

A separate MANOVA was run for each independent variable., One-way analysis of variance (ANOVA) was utilized when a significant difference was observed in the MANOVA for a given independent variable. When significant differences were obtained in an ANOVA procedure, the Scheffe' post-hoc multiple comparisons test was used to identify specific sources of significant differences.

Results

Findings revealed that a majority (59.3%) of the teachers in the study had advanced degrees; 31.2% were certified to teach in fields other than agriculture; 70% had between 6 and 17 years experience in teaching high school agriculture; 78% had been enrolled in high school agriculture; 45% had completed four or more years of high school agriculture; 60.5% had participated in high school FFA activities, and more than 19.2% were over 51 years of age.

Means and standard deviations for each factor score according to selected demographic variables are presented in Table 1. Visual comparison revealed that means tended to be higher on the program planning factor according to: years of teaching experience, academic qualifications, years completed in high school vocational agriculture, participation in high school FFA, and number of certifications in teaching fields other than agriculture, as compared to the six other factors.

Table 1
Means and Standard Deviations for Selected Demographic Variables by Perceived Levels of Competence of Vocational Agriculture Teachers in Alabama, Florida, and Georgia

Selected Demographic Variable	N	CF1	CF2	CF3	CF4	CF5	CF6	CF7
		Mean SD	Mean SD	Mean SD	Mean SD	Mean SD	Mean SD	Mean SD
Years Experience								
1 - 5 years	170	37.90	17.26	28.14	29.57	22.45	11.42	13.16
		6.51	3.86	5.25	4.78	4.93	3.13	2.66
6 - 11 years	62	39.40	17.74	39.53	30.32	23.54	11.64	13.54
		5.61	3.68	4.40	4.70	4.49	2.69	2.57
12 - 16 years	47	38.91	17.74	29.48	29.42	23.04	12.00	13.06
		5.87	3.71	5.02	4.76	3.83	2.77	2.73
17 or more	30	41.51	18.26	30.94	31.46	24.76	12.94	13.97
		6.91	3.75	5.90	5.50	4.67	2.98	2.85
Total Sample	309	38.75	17.41	28.93	29.90	23.01	11.73	13.31
		6.40	3.99	5.16	4.85	4.71	3.00	2.68
Academic Qualifications								
Bachelor's	132	38.50	17.70	28.93	29.94	23.27	11.70	13.28
		6.23	3.76	5.03	4.76	4.83	3.02	2.38
Master's	124	38.70	17.13	28.66	30.10	22.80	11.48	13.14
		6.08	3.90	4.97	4.80	4.64	3.17	2.71

(table continues)

Selected Demographic Variable	N	CF1 Mean SD	CF2 Mean SD	CF3 Mean SD	CF4 Mean SD	CF5 Mean SD	CF6 Mean SD	CF7 Mean SD
Specialist & Doctorate	63	39.43	17.34	29.50	29.70	22.77	12.28	13.73
Total Sample	319	1.72	3.85	6.04	5.71	4.82	2.57	3.13
		38.76	17.41	28.93	29.96	22.99	11.73	13.31
		6.48	3.82	5.21	4.96	4.74	3.00	2.67
Number of Certificates								
One	45	39.37	17.00	29.57	30.77	23.35	12.11	13.51
		7.01	3.95	5.99	5.15	4.68	3.05	2.76
Two	40	38.95	17.32	28.67	29.95	22.67	11.20	13.00
		6.45	3.85	5.22	4.03	4.71	3.31	3.00
Three or more	15	32.40	12.67	24.26	25.53	17.60	10.20	10.60
		8.13	5.30	6.51	1.00	5.24	2.59	3.71
Total Sample	100	38.16	16.48	28.42	29.66	22.22	11.46	12.87
		7.32	4.40	6.00	5.58	5.13	3.14	3.17
Participation in High School FFA								
Yes	196	39.12	17.81	29.36	30.16	23.18	12.19	13.56
		5.86	3.29	4.81	4.54	4.26	2.60	2.57
No	126	38.15	16.74	28.19	29.69	22.73	11.00	12.90
		7.30	4.47	5.76	5.53	5.39	3.40	2.81
Entire Sample	322	38.74	17.39	28.91	29.98	23.01	11.73	13.30
		6.46	3.82	5.22	4.95	4.73	3.00	2.68
Number of Years in High School Agriculture								
0 - 1 year	67	39.65	17.74	28.92	30.61	23.25	12.26	13.91
		6.57	3.92	5.66	4.67	5.07	3.08	2.67
2 - 3 years	42	39.45	17.66	30.04	31.28	24.23	11.90	13.76
		6.36	3.51	5.58	4.03	4.60	2.45	2.80
4 - 5 years	145	38.82	17.62	29.19	29.64	22.97	12.15	13.21
		5.57	3.16	4.42	4.85	3.93	2.67	2.53
Total Sample	254	39.14	17.66	29.26	30.16	23.25	12.14	13.50
		5.97	3.42	4.97	4.70	4.37	2.75	2.63

Note. CF1 = Program planning; CF2 = Leadership Skills; CF3 = Guidance and Counseling; CF4 = Teaching Techniques; CF5 = Occupational Experience; CF6 = Adult Education; CF7 = School and Community Relations

Perceived levels of competence means were lower on adult education and school and community relations for all five selected demographic variables. Mean scores for the program planning factor tended to increase with years of high school agriculture teaching experience. It is of particular note that means were higher for teachers who held one certification than for those with two, three, or more. A similar trend was observed in the mean scores for number of years completed in high school vocational agriculture.

The MANOVA across factor mean scores for number of certifications held in teaching fields other than agriculture produced a Wilks' Lambda of .790, which was significant. Subsequent ANOVA computations for each factor mean score are summarized in Table 2. As shown by the data in the table, there were significant differences on all seven factors. The Scheffe' post-hoc multiple comparisons test revealed that significant differences existed between agriculture teachers with one, two, and three or more

certifications. Comparison of mean scores indicated that teachers with one certification perceived themselves as having higher levels of competence in all seven factors than did those teachers with two and three or more certifications.

Table 2
ANOVA Summaries Across Factors for Number of Certifications Held in Teaching Fields Other Than Agriculture

Factor	MS Between	MS Within	F	F - Prob.
Program Planning	239.28	47.13	5.01	.008**
Leadership Skills	121.36	15.14	8.01	.009*
Guidance and Counseling	170.99	29.63	5.76	.003*
Teaching Techniques	133.40	27.10	4.92	.000*
Occupational Experience	202.42	20.04	10.09	.003*
Adult Education	52.38	8.92	5.81	.000*
School and Community Relations	53.16	8.19	6.48	.002*

Note. * $p < .05$.

The MANOVA for factor mean scores according to number of years completed in high school vocational agriculture produced a Wilks' Lambda of .883, which was significant. Subsequent ANOVA computations are summarized in Table 3. An F of 3.68 for the factor of guidance and counseling was significant, indicating that the source of significance on the MANOVA was in this factor. Post-hoc comparisons revealed that significant difference was as follows: teachers who had completed one year of high school vocational agriculture perceived themselves as having higher levels of competence on the guidance and counseling factor than did teachers with two, three, four or more years of high school agriculture.

Table 3
ANOVA Summaries Across Factors for Number of Years Completed in High School Vocational Agriculture

Factor	MS Between	MS Within	F	F - Prob.
Program Planning	18.47	40.51	0.45	.634
Leadership Skills	2.89	13.52	0.21	.199
Guidance and Counseling	97.44	26.41	3.68 *	.020 *
Teaching Techniques	39.64	24.44	1.62	.190
Occupational Experience	35.27	21.17	1.66	.807
Adult Education	7.85	7.99	0.98	.375
School and Community Relations	4.79	7.24	0.66	.517

Note. * $p < .05$.

The MANOVA across factor mean scores for FFA participation in high school vocational agriculture produced a Wilk's Lambda of .922, which was significant. Subsequent t-test computations for each factor mean score are summarized in Table 4. There were significant differences on four of the seven factors. The factors where statistically significant

differences were obtained were: (a) leadership skills; (b) guidance and counseling; (c) adult education; and, (d) school and community relations. Teachers who had participated in high school FFA had higher mean scores than those who did not. However, the mean scores were concentrated at the lower end of the scale, indicating that they perceived themselves as possessing low levels of competence on all seven factors. Teachers who had not participated reported slightly lower mean scores.

Table 4
T-Test Summaries Across Factors for FFA Participation in High School Vocational Agriculture

Factor'	Group 1	Group 2	t Value	t-prob
	Mean SD	Mean SD		
Program Planning	39.12 5.86	38.15 7.30	1.31	.192
Leadership Skills	17.81 3.29	16.74 4.46	2.47	.014 *
Guidance and Counseling	29.36 4.81	28.19 5.76	1.99	.048 *
Teaching Techniques	30.16 4.54	29.69 5.53	0.82	.412
Occupational Experience	23.18 4.26	22.13 5.39	0.83	.406
Adult Education	12.19 2.20	11.00 3.39	3.58	.000 *
School and Community Relations	13.56 2.57	12.90 2.81	2.16	.032 *

Note. *p < .05. ^a Group 1 = Teachers who participated in high school FFA (n = 198); Group 2 = Teachers who had not participated in high school FFA (n = 126).

Conclusions, Recommendations and Implications

Multivariate analyses revealed inverse relationships between perceived levels of competence when teachers in this study were grouped by: (a) number of certifications in teaching fields other than agriculture; and, (b) the number of years completed in high school vocational agriculture. As number of certifications and number of years in high school agriculture increased, perceived levels of competence tended to decrease. A similar trend was observed on the leadership skills area for teachers who had participated in high school FFA activities. This suggests that teachers perceived themselves as possessing lower levels of competence as their experiences in these areas increased.

An explanation for these observations may be that teachers with a broader knowledge base and experience were perhaps able to make a more realistic and objective assessment of their levels of competence than teachers with a narrow knowledge base. Or, it may be that they were less competent. Results of this study revealed a complex interplay between certain selected demographic experiences and perceived levels of competence as indicators of the teachers' ability to effectively perform professional

work roles. Results also reflected significant differences in the relationship between the selected demographic experiences of high school vocational agriculture teachers in professional agricultural education activities in each of seven factors regarding their perceived levels of competence. These findings could be used for further research to determine if concomitant gains in the performance of such professional activities could be explained by demographic experience. It is, therefore, suggested that these findings be viewed as tentative and subject to further investigation.

The teachers perceived themselves as having low levels of competence in the areas of adult education, supervised occupational experience, and school and community relations. These findings could be used to hypothesize and test further relationships within the organizational framework presently being used for preparing vocational agriculture teachers involved in the study. It is, therefore, recommended that an examination be made of the present emphasis being placed on preparing prospective teachers at state and private universities in these program areas to determine what mitigating factors are evident to account for the apparent loss of perception of competence with additional acquisition of experience.

The findings should also be useful to teacher educators and supervisors who are committed to program improvement at the different levels of agricultural teacher preparation programs. A collaborative effort may be needed to design and implement a research study to provide some agreement between perceptions of practitioners, state department officials, and teacher educators as to the relevance of including some program areas such as adult education, and school and community relations into the high school vocational agriculture program.

Finally, because this research was exploratory in nature and design, and only limited to practitioners in three states, it is recommended that regional as well as national studies be conducted to determine how professional agricultural education competencies are most effectively acquired and measured. The need for this type of research is based on the premise that if competency levels can be agreed upon by practitioners as well as educators, this will ensure a better delivery of quality vocational agriculture education programs.

References

- Amberson, M.L., & Bishop, D. (1982). Instructional objectives for preparing teaching (Ed.), teacher education in agriculture. Danville, IL: The Interstate Printers & Publishers, Inc.
- Farrington, W.S. (1981). Problems of beginning vocational agriculture teachers in the southern region: a project of the southern research conference in agricultural education. University of Florida, Gainesville. (ERIC Document Reproduction Service No. ED 203 205).
- Goode, W.J., & Hatt, P.K. (1952). Methods in Social Research. New York: McGraw-Hill Book Company.
- Hertling, J.E. (1974). Competency-based education: Is it applicable to adult education programs. Adult Education, 23, 50-52.

- King, D.W., & Miller, W.W. (1985). The relative level of difficulty associated with responsibilities of vocational agriculture teachers in Georgia. Journal of the American Association of Teacher Educators in Agriculture, **26** (4), 74-78.
- Krejcie, R.V., & Morgan, D. (1970). Determining sample size for research activity. Educational and Psychological Measurement.
- Lin, N. (1976). Foundations of social research. New York: McGraw-Hill Book Company.
- Porter, L.W., Lawer, E.E., & Hackman, J.R. (1975). Behavior in Organizations. New York: McGraw-Hill Book Company.
- Rawls, W.J., & Fatunsin, L.O. (1985). Importance and utilization of professional education competency areas needed by vocational educators. Journal of Vocational Educational Education Research, **10** (1), 59-62.
- Ready, R.K. (1967). Administrative Job Issues and Dilemma. New York: McGraw-Hill Book Company.
- Santopolo, F.A., & Johnson, R.J. (1970), Sociological concepts relevant to training extension workers for community resource development. Journal of Community Development, **1** (2), 104-112.
- Sarbin, T.R. (1954). Role theory. In G. Lindzey (ed.), Handbook of Social Psychology. Reading, MA: Wesley Publishing Co.
- SPSS-X user's guide. (2nded.). (1986). New York: McGraw-Hill Book Company.
- Sunderhaus, T.L., & Miller, W.W. (1985). Assessment of the organizational & instructional difficulties associated with job tasks of Indiana vocational agriculture instructors. Journal of the American Association of Teacher Educators in Agriculture, **26** (4), 65-70.