Journal of Agricultural Education
Volume 40, Number 4, pp. 57-66
DOI: 10.5032/jae.1999.04057

THE INFLUENCE OF SCIENCE APPLICATIONS IN AGRICULTURE COURSES ON ATTITUDES OF ILLINOIS GUIDANCE COUNSELORS AT MODEL STUDENT-TEACHING CENTERS

James E. Dyer, Assistant Professor
University of Missouri

Edward W. Osborne, Professor and Head of Agricultural Education & Communication
University of Florida

Abstract

The purpose of this study was to determine the attitudes of Illinoisguidance counselors in model student teachingsites towardagriculture, agricultural technologies, andagriculture andscienceprograms. Results indicated that counselors heldpositive perceptions in all areas, with the mostpositive attitudes reported in agricultural technologies. Agriculture and science programs were both viewed as being high in quality. Counselors believed agricultural education to be too vocational and not scientific enough. Counselors in schools with applied science in agriculture coursework rated agriculture program quality to be higher than did those in schools without these courses. Counselors expressing the most positive attitudes towards agriculture and agricultural education were female; 40 or more years of age; had knowledge of agricultural coursework; and had teaching backgrounds in science, special education, or English.

Introduction

Throughout much of its existence, agricultural education has prepared students for entry into the production phase of agriculture. Curricula were created and designed to be both practical and applicable for students who were returning to the farm, concentrating on the "how" rather than the "why" of agricultural production (National Research Council, 1988). Funded by the Smith-Hughes Act in 1917, amendments in 1963, 1968, 1972, 1976, and 1984 expanded the role of agricultural education and altered the base of individuals served.

In Illinois, agriculture program enrollments have fluctuated sharply over the past 20 years. Reaching a high in 1979, enrollment totaled 29,502 students in 397 programs. By 1991, enrollment had plummeted to 11,733 students in 325 programs--a loss of over 60% (Illinois State Board of Education [ISBE], 1993). Over the same period, the enrollment of Illinois high school age students decreased by only 25%, from 676,106 to 506,941 (ISBE, 1991), suggesting that other factors contributed to attrition of agriculture program enrollments.

While enrollment in agriculture classes was declining, enrollment in science classes increased. The percentage of high school students studying science increased from 95.2% to 99.4% from 1970 to 1990. However, overall science achievement for students tested at ages nine and thirteen showed no increase between the two periods. Achievement levels actually decreased in high school age students (Office of Educational Research and Improvement, 1993).

The National Research Council in its 1988 publication Understanding Agriculture: New Directions for Education charged that curriculum content had failed to keep pace with modem agriculture. The Council recommended that applied science courses in agriculture be available as optional elective science courses, incorporating more agriculture into the curriculum and providing for more effective teaching of science.

Research findings have supported the Council's contention that integration of science into agriculture curricula is a more effective way to teach science. Enderlin and Osborne (1991, 1992), Enderlin and Petrea (1993), Roegge and Russell (1990), and Whent and Leising (1988) all reported that students taught by integrating agricultural and scientific principles demonstrated higher achievement than did students taught by traditional approaches. However, according to Enderlin and Osborne (1992), for science-intensive courses to be effective, various school personnel and educational leaders must feel a change is needed and work closely together to promote and support the concept.

Especially important is the support of guidance counselors. Several studies (Holder, 1973; Slocombe, 1986; Thompson & Russell, 1993) report that guidance counselors play an important role in the educational and career plans of students. Likewise, numerous investigators have documented counselors' support for agricultural and/or vocational education (Matulis, 1989; Pryor, 1984; Thompson, 1989). Since those studies were conducted, however, several major developments have taken place that may have affected counselors' attitudes and directly impacted the support afforded agricultural education in secondary schools in Illinois. One such development is the introduction of two new agriscience courses, Biological Science Applications in Agriculture (BSAA) and Physical Science Applications in Agriculture (PSAA), into the curriculum of many Illinois schools. With the infusion of these courses, students may receive laboratory science credit, even though enrolled in agriculture courses. Since their introduction enrollment figures in agriculture education programs have begun to rise (ISBE, 1993).

In view of fluctuating agricultural program enrollments and the influence of guidance counselors on students' educational and career plans, it is important to know how these developments have influenced counselors' attitudes. Equally important is knowledge of the attitudes of counselors toward some of the best agriculture programs. Do counselors recognize quality agriculture programs when they exist, or do they view all agriculture programs and courses equally? Dyer and Osborne (1994) reported that counselors perceived science programs to be of higher quality than agriculture programs. Is the same true if the agriculture program is of superior quality? If not, then the logical recommendation should be that program quality should be the focus of inservice efforts. Also, if counselors are aware of superior agriculture program quality, are those counselors more likely to place students in agriculture courses?

Whereas Dyer and Osborne (1994) determined the attitudes of the general population of Illinois guidance counselors toward agriculture and agricultural programs, no study has determined the attitudes of counselors in the highest quality agriculture programs. If different from those expressed by counselors across all quality levels, knowledge of those differences could aid in the continued improvement of agriculture programs, and in the development and implementation of effective public relations programs by state staff, administrators, guidance counselors, and science and agriculture teachers. The conceptual model for this study emphasized the need to study those factors that influence guidance counselor decisions to recommend courses, a field of study, and/or a corresponding career. Fishbein and Ajzen (1975) provided the theoretical framework for this study. They determined that intentions could be predicted based upon knowledge, observation, or other information about some issue. Their work suggests that a person's intent to recommend study in a particular subject area can be predicted by analyzing his/her beliefs about that area of study. Greenwald (1989) supported this theory, reporting that individuals with positive attitudes toward subjects tend to evaluate them positively.

Purpose and Objectives

The primary purpose of this study was to determine the attitudes of guidance counselors in model student-teaching sites in Illinois toward agriculture, agricultural technologies, and agricultural and science education programs. A secondary purpose was to investigate the relationships of guidance counselor attitudes and selected demographic variables. The objectives of the study were as follows:

1. To determine the attitudes of guidance counselors in model student-teaching centers toward: (a) agriculture as a career field, (b) agricultural technologies, (c) educational programs in agriculture, (d) agriculture program quality, and (e) science program quality.

2. To determine the influence of applied science in agriculture courses on guidance counselors' attitudes toward agricultural education.

3. To determine counselors' attitudes about agriculture and agricultural education programs across the demographic lines of teaching experience, age, and gender.

Procedures

This survey research was descriptive in nature. The population of this study consisted of all guidance counselors in schools that serve as agricultural education student-teaching centers for the University of Illinois and Illinois State University (N = 32). Faculty in those institutions identified a total of 19 programs that represented the highest quality programs using quality indicators identified in a study by Russell, Osborne, Moss, Metcalf, and Wood (1991).

Since the total population was being studied, the possibility existed that in schools with several guidance counselors, the distribution of population means could be disproportionately influenced by attitudes toward only one or two agriculture programs – if those programs were in schools with multiple counselors. To prevent this situation, a purposively selected sample was used consisting of one counselor selected from each of the model centers (n = 19). In schools with more than one counselor, the participant was randomly selected. In addition, the principal and cooperating teacher at each site were selected to triangulate guidance counselors' responses.

A five-part questionnaire specific to the objectives of the study was developed by the researchers. The questionnaire was reviewed for content validity by an expert panel from the University of Illinois College of Agriculture faculty. The instrument was pilot tested utilizing 25 guidance counselors randomly selected from the general population of Illinois counselors not included in the study. A reliability estimate was determined for constructs I-IV using Cronbach's alpha (range of r = .80 - .99).

A five-point Likert-type scale (1 = Strongly Disagree . . . 5 = Strongly Agree) was used for the 50 items that comprised Parts I (Agriculture As a Career Field), II (Agricultural Technologies), and III (Educational Programs in Agriculture) of the instrument. The 16 questions comprising Part IV of the questionnaire (Agriculture and Science Program Quality) were also measured on a five-point Likert-type scale (1 = Very Low 5 = Very High) and assessed counselors' attitudes toward agriculture and science program quality. The 11 demographic questions that comprised Part V of the instrument were close-ended and partially close-ended items. Additional instruments were prepared for use in triangulating counselor responses with principals and agricultural education teachers as outlined by Borg and Gall (1989). Triangulating instruments contained all but the demographic data of the guidance counselor questionnaires.

A questionnaire packet with a cover letter was mailed to all participants, with a follow-up letter mailed approximately two weeks later. A

second follow-up letter accompanied by an additional packet was mailed approximately four weeks after the first mailing. A total of 84.2% (n = 16) of the counselors, 74% (n = 14) of the principals, and 94.7% (n = 18) of the agricultural educators returned questionnaires. Comparisons were made between early and late respondents. A t-test indicated no significant statistical difference between the two groups. The alpha level of .05 was set a priori. Descriptive statistics, including measures of central tendency and variability were used to summarize and analyze data. Categorical analysis was performed using the following scale: Strongly Disagree or Very Low (M = 1 .O- 1.49), Disagree or Low (M = 1.50-2.49), Uncertain or Average (M = 2.50-3.49), Agree or High (M = 3.50-4.49), Strongly Agree or Very High (M = **4.50-5.0).**

Results

Objective 1:

To determine the attitudes of guidance counselors in model student-teaching centers toward: (a) agriculture as a career field, (b) agricultural technologies, (c) educational programs in agriculture, (d) agriculture program quality, and (e) science program quality.

Triangulation results from questionnaires mailed to principals and agricultural education teachers confirmed the accuracy of the reported attitudes of counselors with one exception: Counselors reported that they disagree with the statement that agriculture courses are best suited for male students. However, principals and agriculture teachers perceived that counselors agree with the statement, indicating that counselor responses on this item are subject to question.

Table 1 contains summated means of counselor attitudes on each of the study's constructs. The most positive perceptions were held on the constructs of "Agriculture as a Career Field" (M = 4.41) and "Agricultural Technology" (M = 4.37). The least positive perceptions were in the constructs "Educational Programs in Agriculture" (M = 3.60) and "Agriculture Program Quality" (M = 3.88).

Table 1. Summated Means of Guidance Counselor Attitudes Toward Constructs

Category	Grand Mean[a]
Agriculture As a Career Field	**4.41**
Agricultural Technology	**4.37**
Science Program Quality	4.14
Agriculture Program Quality	**3.88**
Educational Programs in Agriculture	**3.60**

"Grand mean determined after reverse coding of negative statements.

Agriculture As a Career Field

The most agreed upon statement in the study was that agriculture is one of Illinois' most important industries (M = 4.88). Counselors also agreed most students are unaware of the impact of agriculture on their daily lives (M = 4.3 1).

Agricultural Technology

Among the statements with which counselors most agreed, four of the five highest reported means were in the construct "Agricultural Technology." Counselors agreed that: sustainable agriculture can help protect the environment (M =

4.63), agricultural technologies have a positive effect on the U.S. standard of living (M = 4.63), biotechnology in agriculture will provide safe products for society (M = 4.56), and agriculture has the capacity to develop new technologies to improve society (M = 4.50).

Educational Programs in Agriculture

Counselors agreed that: agriculture courses are beneficial for higher achieving students (M = 4.00), college-bound students should be encouraged to enroll in high school agriculture courses (M = 3.60), and more students should be encouraged to enroll in agriculture courses at both the high school (M = 3.8 1) and college levels (M = 3.75). They were uncertain about the benefits for lower achievers (M =3.44) and about every high school student taking some course work in agriculture (M = 2.69).

Counselors also agreed that high school agriculture courses should become less vocational (M =3.50) and that numerous career opportunities for employment exist in the field of agriculture (M = 4.44). Counselors were uncertain, however, as to whether salaries of university graduates in agriculture programs are competitive (M = 3.13) or as to whether most university graduates are male or female (M = 3.38).

Counselors also expressed beliefs that students can complete an agricultural program and still meet college preparatory requirements (M = 4.3 1), high school agriculture is good preparation for college study in agriculture (M = 4.25) and employment in agriculture (M = 4.13), high school agriculture courses are beneficial for higher achieving students (M = 4.00), and that stronger ties should be made between high school agriculture and science curricula (M = 4.00).

Statements with which counselors least agreed were in the construct "Educational Programs in Agriculture." Counselors strongly disagreed with the statements that only students with farm backgrounds should pursue careers in agriculture (M = 1.3 8), only students with farm backgrounds should enroll in high school agriculture courses (M = 1.38), high school agriculture courses are better suited for male students (M = 1.56), agriculture has greatly contributed to the deterioration of the environment (M = 1.87), and high school agriculture courses should be primarily offered in rural communities (M = 2.06). Counselors also disagreed that science applications in agriculture would best be taught by science teachers (M = 2.19).

Science and Agriculture Program Quality

Counselors viewed agriculture and science programs similarly (Table 2). Counselors rated science programs higher than agriculture programs in the academic ability of students who enroll, but they perceived the work value of agriculture programs as higher than that of science programs. Respondents rated both science and agriculture programs as "High" in the value of the program to students who attend college, overall program quality, quality of instruction, competency and preparation of teachers, and reputation among faculty and administration.

Objective 2:

To determine the influence of applied science in agriculture courses on guidance counselors' attitudes toward agricultural education.

BSAA/PSAA courses were taught in 11 of the 16 schools in the study. Counselors in schools with these courses perceived the reputation of the agriculture program to be higher than did counselors in schools where no courses were taught. High standard deviations were noted in several instances, indicating disagreement among counselors in their attitudes toward agriculture programs (Table 3).

Table 2. Comparison of Counselor Perceptions of Science and Agriculture Program Quality

Item	Science		Agriculture	
	M	Category	M	Category
Academic ability of students	4.07 (.62)	High	3.36 (.50)	Average
Value of program to students who attend college	4.47 (.64)	High	3.73 (.70)	High
Overall program quality	4.13 (.83)	High	4.20 (.77)	High
Quality of instruction	4.13 (.91)	High	4.13 (1.12)	High
Competency and preparation of teachers	4.40 (.74)	High	4.27 (.80)	High
Reputation of program among students	4.06 (1.10)	High	3.60 (.99)	High
Reputation of program among faculty and administration	4.20 (.86)	High	3.87 (1.06)	High
Work value of program	3.33 (.90)	Average	3.93 (.59)	High

Note. Very Low (M = 1.0-1.49), Low (M = 1.50-2.49), Average (M = 2.50-3.49), High (M = 3.50-4.49), Very High (M = 4.50-5.0).

Table 3. BSAA/PSAA Influence on Counselor Percentions of Agriculture Programs

Item	With BSAAIPSAA (n = 11)		Without BSAAIPSAA (n= 5)	
	M	Category	M	Category
Academic ability of students	3.45 (.52)	Average	3.00 (.00)	Average
Value of program to students who attend college	3.82 (.75)	High	3.50 (.58)	High
Overall program quality	4.45 (.69)	High	3.50 (.58)	High
Quality of instruction	4.27 (1.01)	High	3.75 (1.50)	High
Teacher competency and preparation	4.45 (.69)	High	3.75 (.96)	High
Reputation of program among students	3.91 (.94)	High	2.75 (.50)	Average
Reputation of program among faculty and administration	4.00 (1.00)	High	3.50 (1.29)	High

Note. Very Low (M = 1.0-1.49), Low (M = 1.50-2.49), Average (M = 2.50-3.49), High (M = 3.50-4.49), Very High (M = 4.50-5.0).

Objective 3:

To determine counselors' attitudes about agriculture and agricultural education programs across the demographic lines of teaching experience, age, and gender.

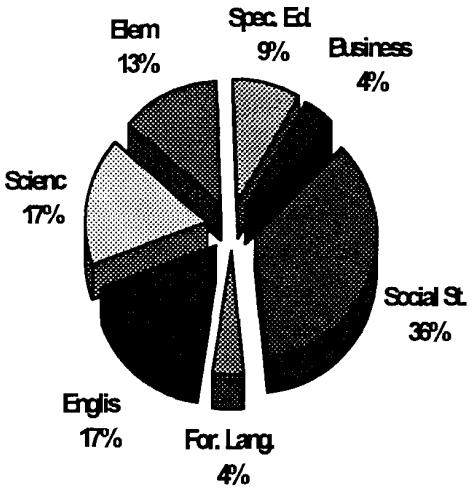

Figure 1. Areas of teaching experience.

Teaching Experience

Counselors reported a mean of 15 .25 years as guidance counselors with 9.25 years ofteaching experience. They reported most of their teaching experience to be in social studies, followed respectively by English and science (tied), elementary education, special education, and business and foreign language (Figure 1). Two counselors reported no teaching experience. No significant differences were found in statements from any of the survey areas except Agriculture as Career Field (Table 4). Counselors with teaching experience in science, special education, or English expressed attitudes more favorable toward this construct.

Age

The eight male and eight female counselors responding to the questionnaire indicated an average age of 44.56 years. Twelve of the 16 counselors surveyed reported ages of 40 years or older. While both groups expressed positive attitudes, counselors over 40 years of age were more positive in their attitudes toward agriculture than were their younger counterparts (Table 5). Counselors under 40 years of age differed categorically from those over 40 in their perception that most students are unaware of the impact of science on their daily lives.

Table 4. Analysis of Variance of Counselors' Teaching Experience Area and Attitude Toward Agriculture as a Career Field

Source	df	MS	F-ratio
Between Groups	5	2.40	8.00*
Within Groups	10	.30	
Total	15		

*$p < .05$.

Gender

Responses of counselors also differed by the gender (Table 6). Male respondents expressed attitudes that were generally more traditional than did female counselors. Female responses indicated they "strongly agree" that agriculture should do more to publicize its scientific contributions to society and that high school agriculture should become less vocational. Whereas male counselors disagreed that agriculture courses are better suited for males, and that only students with farm backgrounds should enroll in high school agriculture courses and/or pursue careers in agriculture, female counselors strongly disagreed with these statements. Male counselors perceived limited background/preparation in agriculture on the part of science teachers, whereas female counselors were generally uncertain. Male counselors viewed the competency and preparation ofagriculture teachers as "Very High;" female counselors viewed it as "High." Female counselors also reported the college value of the science program as "Very High"

Table 5. Comparison of Attitudes Toward Selected Statements bv Age of Counselors

Item	Age ≥40 (n = 12) M	SD	Age <40 (n = 4) M	SD
Agriculture is a scientific area of study	4.58"	,515	3.25"	.957
Agriculture is a highly technical field	4.58"	.515	3.50"	1.000
Agriculture is one of Illinois' most important industries	5.00"	.000	4.50"	.577
The image of agriculture is improving	4.33"	.651	3.25"	.500
More students should enroll in high school agriculture	4.17"	.718	2.75"	.957
Agriculture incorporates applications of scientific principles	4.50"	.522	3.75"	.500
Most students have a positive image of agriculture	3.75"	.965	2.25"	.500
Agriculture teacher competency and preparation	4.55[b]	.688	3.50[b]	.577
College value of agriculture	3.91[b]	.701	3.25[b]	.500
Quality of instruction in agriculture programs	4.45[b]	.820	3.25[b]	1.500
Reputation of agriculture program among faculty	4.18[b]	.751	3.00[b]	1.414
Reputation of agriculture program among students	3.91[b]	,944	2.75[b]	.500
Most students are unaware of the impact of science on their daily lives	3.42"	1.084	4.50"	.577

"Strongly Disagree (M = 1.0-1.49), Disagree (M = 1.50-2.49), Uncertain (M = 2.50-3.49), Agree (M = 3.50-4.49), Strongly Agree (M = 4.50-5.0). [b]Very Low (M = 1.0-1.49), Low (M = 1.50-2.49), Average (M = 2.50-3.49), High (M = 3.50-4.49), Very High (M = 4.50-5.0).

Table 6. Comparison of Counselor Attitudes Toward Selected Statements by Gender

Item	Male (n= 8) M	SD	Female (n = 8) M	SD
Agriculture should do more to publicize its scientific contributions to society	4.00"	.535	4.62"	.518
High School agriculture courses are better suited for males	1.87"	.354	1.25"	.463
Only students with farm backgrounds should enroll in high school agriculture courses	1.62"	.518	1.12"	.354
Only students with farm backgrounds should pursue careers in agriculture	1.62"	.518	1.12"	.354
High school science teachers have limited backgrounds/preparation in agriculture	4.29"	.488	3.25"	1.165
Competency and preparation of agriculture teachers	4.50[b]	.926	4.00[b]	.577
College value of science program	4.25[b]	,707	4.75[b]	,463
High school agriculture should become less vocational	3.28"	.756	3.71"	.756

[a]Strongly Disagree (M = 1.0-I .49), Disagree (M = 1.50-2.49), Uncertain (M = 2.50-3.49), Agree (M = 3.50-4.49), Strongly Agree (M = 4.50-5.0). [b]Very Low (M = 1.0-1.49), Low (M = 1.50-2.49), Average (M = 2.50-3.49), High (M = 3.50-4.49), Very High (M = 4.50-5.0).

compared to a "High" perception by male counselors.

Conclusions and Recommendations

Illinois guidance counselors in model student-teaching centers consider agriculture to be important economically, environmentally, technologically, and scientifically. The highest level of agreement was in the construct "Agriculture as a Career Field." Counselors perceive agriculture to be a highly technical field. They also perceive that agricultural education is good preparation for college study and/or employment in agriculture, that agriculture courses benefit higher achieving students, and that students can complete an agriculture program and still meet graduation and college entrance requirements. These findings indicate a possible relationship between counselor support and the academic ability of students placed in an agriculture program. However, further research is needed in this area to verify this supposition.

Counselors in schools where applied science in agriculture courses were taught displayed more positive attitudes toward agricultural education and perceived that students and faculty also had higher perceptions. This finding contradicts that reported by Dyer and Osborne (1994) where counselors from a general state-wide sample expressed attitudes classifies as "uncertain" as to the value of agricultural education. These differences may indicate that applied science courses such as B SAA and PSAA have a positive influence on counselors. If so, these courses also have the potential to become effective public relations tools for agriculture programs. Additional research should be conducted to determine the perceptions of students, faculty, and administrators in schools where science applications in agriculture courses are taught.

Demographic variables of teaching experience, gender, and age of counselors influence counselors' attitudes and perceptions. Counselors with teaching experience in science, special education, and English expressed the most positive attitudes toward agriculture. Male counselors perceive agricultural education to be more traditional than do female counselors. Counselors aged 40 years or older reported more favorable attitudes toward agriculture than did those individuals under 40 years of age, however, no differences in attitudes toward science programs existed between the age groups. Counselors, administrators, teachers, students, and parents should be aware of those differences in making decisions pertaining to programs. Agriculture teachers should make every effort to address those differences with effective public relations programs.

References

Dyer, J. E., & Osborne, E. W. (1994). The influence of science-based agriculture courses on Illinois guidance counselor attitudes. Proceedings of the 48th Annual Central Region Research Conference in Agricultural Education, 57-68.

Enderlin, K. J., & Osborne, E. W. (1991). Achievement and retention of middle school science students in a laboratory oriented agriculture plant science unit of study. Proceedings of the Central States 45th Annual Research Conference in Agricultural Education, Springfield, IL.

Enderlin, K. J., & Osborne, E. W. (1992). Student achievement, attitudes, and thinking skill attainment in an integrated science/agriculture course. Proceedings of the Nineteenth Annual National Agricultural Education Research Meeting, 3 7-44.

Enderlin, K. J., & Petrea, R. E. (1993). Student and teacher attitude toward and performance in an integrated science/agriculture course. Proceedings of the 47th Annual Central Region Research Conference in Agricultural

Education, 195-200.

Fishbein, M. & Ajzen, 1. (1975). Beliefs, Attitudes. Intentions, and Behaviors. Reading, MA: Addison-Wesley Publishing Co.

Greenwald, A. G. (1989). Attitude structure and function. Hillsdale, NJ: Erlbaum Associates.

Holder, A. D. (1973). Attitudes of parents and students toward vocational education. (Doctoral Dissertation, Colorado State University, 1973). Dissertation Abstracts International. 33, 4265A.

Illinois State Board of Education. (1991). 1991 Annual statistical report. Springfield, IL: Author.

Illinois State Board of Education. (1993). [Agriculture program enrollment statistics]. Unpublished raw data.

Matulis, J. K. (1989). Attitudes. perceptions, and guidance practices of Illinois guidance directors concerning vocational education in secondary schools. Unpublished doctoral dissertation, University of Illinois at Urbana-Champaign.

National Research Council. (1988). Understanding agriculture: New directions for education. Washington, DC: National Academy Press.

Office of Educational Research and Improvement. (1993). The condition ofeducation. Washington, DC: U.S. Government Printing Office.

Pryor, W. D. (1984). A study of the attitudes of high school administrators, guidance counselors, and teachers in Nacogdoches County, Teas, toward vocational education. Dissertation Abstracts International. 44, 3368A. (University Microfilms No. 84-0333 1)

Roegge, C. A., & Russell, E. B. (1990). Teaching applied biology in secondary agriculture: Effects on student achievement and attitudes. Journal of Agricultural Education, 3 1 (1), 37-45.

Russell, E. B., Osborne, E. W., Moss, J. W., Metcalf, A. L., & Wood, J. A. (199 1). Establishing cooperating schools as model sites for student teaching. Urbana-Champaign: University of Illinois, Agricultural Education Program.

Slocombe, J. W. (1986). Factors associated with enrollment in agricultural curricula at land grant universities. Proceedings of the 40th Annual Research Conference in Agricultural Education, Central Region, Chicago, IL.

Thompson, J. C., Jr. (1989). Beliefs and intentions of counselors. parents, and students regarding agriculture as a career choice. Unpublished doctoral dissertation, University of Illinois at Urbana-Champaign.

Thompson, J. C., Jr., & Russell, E. B. (1993). Beliefs and intentions of counselors, parents, and students regarding agriculture as a career choice. Journal of Agricultural Education. 34(4), 55-63.

Whent, L. S., & Leising, J. (1988). A descriptive study of the basic core curriculum for agriculture students in California. Proceedings of the 66th Annual Western Region Agricultural Education Research Seminar. Fort Collins, CO.