Journal of Agricultural Education
Volume 44, Number 2, pp. 75-85
DOI: 10.5032/jae.2003.02075

PROBLEMS IN RECRUITING STUDENTS INTO AGRICULTURAL EDUCATION PROGRAMS: A DELPHI STUDY OF AGRICULTURE TEACHER PERCEPTIONS

James E. Dyer, Assistant Professor
University of Florida
Lisa M. Breja, Director of Graduate Student Services
Iowa State University

Abstract

This national study used the Delphi technique to identify problems that secondary agriculture teachers experience in recruiting students in high school agriculture programs. The study used a series of four mailed questionnaires. The first round of the study used a questionnaire with an open-ended question to facilitate the generation of a wide array of response categories. In round two respondents were asked to rate the 28 problems identified in round one on a Likert-type scale and to make changes in the items as necessary. In rounds three and four respondents were sent the results from the previous round and asked to provide a dichotomous indication of whether or not they agreed or disagreed with each of the revised items. Consensus was reached in the fourth round. The major problems identified by the Delphi technique in the successful recruitment of students into agriculture programs were: scheduling difficulties, finding time to recruit, student involvement in other activities, access to students, competition from other programs, lack of guidance counselor support, increased graduation requirements, image of agriculture, lack of interest in agriculture, and block scheduling.

Introduction

Historically, agricultural education has focused on teaching the principles of production agriculture to a relatively small population of students – usually an audience of white, male, rural students who were returning to the farm. Funded as vocational agriculture, some school systems strictly adhered to the "vocational" concept, focusing on the "how" rather than the "why" of instruction. With the advance of the scientific age, this emphasis resulted in decreased agricultural enrollments and de-emphasized the scientific nature of agriculture in favor of its vocational aspect (National Research Council [NRC], 1988). In its report entitled *Understanding Agriculture: New Directions for Education*, the NRC recommended that the "vocational" label be avoided in order to more adequately portray the scientific and technical nature of agriculture.

Ten years after the NRC's report, the profession was at least somewhat successful in removing the "vocational" stigma attached to secondary agriculture courses. Modernized and scientific curricula have been created and designed to be both practical and applicable, yet emphasize the scientific nature of agriculture (Dyer & Osborne, 1997). Several states embarked upon high school agriculture curriculum development and redesign efforts in the 1990s (Dormody, 1993; Johnson, 1995; Osborne & Dyer, 1996). Whether caused by changes in curricula or by other variables, a corresponding increase in student enrollments occurred as major changes in course offerings were made (United States Department of Education, 1996).

The current research base reveals a problem in attracting minority students. Nichols and Nelson (1993) reported that Hispanic populations tend to view agriculture negatively. Talbert and Larke (1993) further defined the problem in noting that black and Hispanic students tend to have more negative attitudes toward the traditional components of agriculture. They also reported that white students tend to

enroll because of interest in agriculture, or for career reasons.

Hoover and Scanlon (1991) reported the image of the agriculture profession and perceived future value of agricultural education as obstacles. They also reported that FFA activities were successfully used in recruitment. They reported that visiting students and the use of technology did not work effectively because of the time constraints involved. Graham (1985) reported that positive influences on deciding to enroll in a college program included the quality of academic programs, academic reputation, atmosphere/appearance of the campus, and quality of the faculty. He noted that visiting a friend or family member on campus, talking with university students or graduates and/or high school counselors, and participation in on-campus events were effective strategies. Other studies have revealed similar findings. However, since recruitment problems are often entwined, the need existed to identify those problems *en masse* that teachers face in recruiting students.

Some programs have apparently identified and solved those problems associated with recruiting and retaining students. Agricultural enrollments in several states have equaled or surpassed those of the pre-recession era of the late 1970s (Iowa Department of Education, 1997; Missouri Department of Elementary and Secondary Education, 1998; North Carolina State University, 1997). However, even with these successes, agriculture programs on a national scale continue to face enrollment stagnation (National FFA Organization, 1998).

Whereas some states have been successful in building enrollments, agricultural education programs in other states continue to struggle to recruit enough students (National FFA Organization, 1998). In these states, there remains the problem of recruiting and offering enough programs to adequately serve the industry of agriculture (Russell, 1993).

University teacher education programs in agriculture experience the ripple effect of the recruitment problems experienced in high school agriculture programs. As many as 38 of the 50 states are unable to graduate enough agriculture teachers from university agricultural education programs to meet the demand for new high school agriculture teachers (Camp, Egan, Garton, Dyer, Flowers, Stewart, Williams, Scofield, & Foster, 1996). Camp (1998) estimated that high school and university agriculture programs would have to more than double enrollments to satisfy the growing demand for agricultural education graduates by both industry and education. The lack of adequate high school agriculture enrollment has translated at the post-secondary level into fewer students with agricultural training entering colleges of agriculture. Dyer, Lacey, and Osborne (1996) reported that the inability of colleges to recruit and retain students with agricultural backgrounds translates into the loss of millions of dollars for universities.

Purpose and Objective

Recruitment of quality students has been, and continues to be, one of the most important and complex problems facing both secondary and university agricultural education programs today. The purpose of this study was to identify those problems that serve as obstacles to the successful recruitment of quality students into secondary agricultural education programs. The objective of the study was to identify the major problems facing high school agriculture teachers in recruiting students for secondary agricultural education programs, as identified by agriculture teachers.

Procedures

This national study used the Delphi technique to identify problems that secondary agriculture teachers face in recruiting students in high school agriculture programs. Delp, Thesen, Motiwalla and Seshadri (1977) described the Delphi technique as a group process used to solicit, collate, and direct expert responses toward reaching consensus. Helmer (1966) described the Delphi technique as a method of substituting computed consensus for an agreed-upon majority opinion.

The population for this study consisted of secondary teachers of high school agriculture. Stufflebeam, McCormick, Binkerhoff, and Nelson (1985) noted the Delphi technique is especially effective in obtaining consensus among a purposively selected group of experts. In selecting the expert panel members, state staff and teacher educators from each state were asked to nominate teachers from secondary agricultural education programs in their states that were considered to be outstanding in their ability to recruit and retain students. Teacher educators and state staff provided a total of 275 unduplicated nominees. From this list a stratified random sampling technique was used to select 24 teachers to participate in the study. The four regions of the American Association for Agricultural Education comprised the strata from which six teachers each were selected. Dalkey (1969) stated that the reliability was greater than .80 when Delphi group size was larger than 13.

The study used a series of four mailed questionnaires. Moore (1987) noted that a series of mailed questionnaires was the typical methodology of the Delphi technique. The first round of the study used a questionnaire with the open-ended question: "What are the major obstacles confronting teachers in the recruitment of students in agricultural education programs?" An open-ended question was used to facilitate the generation of a wide array of response categories. Responses were then categorized by the researchers to produce items for a second round questionnaire. Questionnaires were validated using an expert panel of university teacher educators, state agricultural education staff members, and agriculture teachers not included in the study.

In the second questionnaire, respondents were asked to rate the items identified in round one on a five-point Likert-type scale (1 = Strongly Disagree, 2 = Disagree, 3 = Uncertain, 4 = Agree, 5 = Strongly Agree). From second-round responses the list of categories was further reduced to 18.

The third questionnaire sought to determine consensus. Panel members were asked to indicate whether they agreed or disagreed with each of the 18 statements, and to provide comments if they could not agree with the summary findings. Consensus was reached on eight of the 18 items in this round, with suggested revisions in several of the other statements. As noted by McCampbell and Stewart (1992), most Delphi studies reach consensus at the third round. However, failing to achieve consensus on a majority of the items, a fourth round was initiated.

The fourth and final questionnaire also asked the respondents to indicate whether they agreed or disagreed with the remaining 10 statements as adapted from round three. Consensus was reached in this round so no further responses were required.

Analysis of Data

Data were analyzed using descriptive statistics. Data collected using Likert-type scales were treated as interval data and reported as means and standard deviations. Nominal data were reported using frequencies and percentages.

Results

The objective of this study sought to identify the major problems facing high school agriculture teachers in recruiting students for secondary agricultural education programs. To accomplish this objective the Delphi technique of obtaining group consensus was used. The first round of the study used a questionnaire with an open-ended question to facilitate the generation of a wide array of response categories. The response rate for this round was 75%. Thirty-five categories of problems were identified in the first round. This number was reduced to 28 items when categories with a single response were eliminated. Table 1 contains problems identified in round one. All respondents identified guidance counselor support and scheduling difficulties as problems of recruitment.

Table 1
Delphi Study Round One: Categories of Recruitment Problems (n = 18)

Problem Category	Number of Responses
Guidance counselor support	18
Scheduling difficulties	18
Image of agriculture	17
Competition from other programs in school	16
Graduation requirements – not enough time for agriculture coursework	16
Access to potential students	14
Time to recruit	13
Students active in other programs, activities, etc.	13
Image of the agriculture program	13
School policies	12
Parental support	11
Administrative support	11
Quality of students in the program	11
Students have no interest in agriculture	10
Agriculture program quality	10
SAE participation	10
Salaries in the field of agriculture	9
Block scheduling	8
Community support	7
History of the agriculture program	6
Teacher commitment to recruiting	6
Quality of agriculture course instruction	6
Quality of agriculture curriculum	6
Poor facilities	4
Employment opportunities agriculture	4
Teacher quality	3
Type of curriculum – too traditional	3
FFA activities	3

Eighteen of the 24 individuals responded in round two for a 75% response rate. In this round respondents were asked to rate the 28 problems identified in round one on a Likert-type scale (1 = Strongly Disagree, 2 = Disagree, 3 = Uncertain, 4 = Agree, 5 = Strongly Agree), and to make changes in the items as necessary. Results of this round of responses are displayed in Table 2.

Table 2
Delphi Study Round Two: Level of Agreement with Ranked Categories of Recruitment Problems (n = 18)

Problem Category	*M*	*SD*	Level of Agreement[a]
Competition from other programs	3.94	.87	Agree
Time to recruit	3.83	1.10	Agree
Guidance counselor support	3.78	1.22	Agree
Scheduling difficulties	3.78	1.22	Agree
Students active in other programs, activities, etc.	3.61	1.04	Agree
Image of agriculture	3.61	1.09	Agree
Access to potential students	3.56	.98	Agree
Administrative support	3.50	1.15	Agree
Graduation requirements - not enough time for agriculture courses	3.28	1.32	Uncertain
Parental support	3.00	1.28	Uncertain
Quality of students in the program	2.94	1.35	Uncertain
No interest in agriculture	2.94	1.39	Uncertain
School policies	2.89	1.08	Uncertain
Image of the agriculture program	2.89	1.13	Uncertain
SAE participation	2.78	1.17	Uncertain
Teacher commitment to recruiting	2.78	1.26	Uncertain
Salaries in agriculture	2.78	.88	Uncertain
Block scheduling	2.71	1.31	Uncertain
Community support	2.47	1.07	Disagree
History of the agriculture program	2.44	1.29	Disagree

Table Continues

Table 2 Continued

Delphi Study Round Two: Level of Agreement with Ranked Categories of Recruitment Problems (n = 18)

Problem Category	*M*	*SD*	Level of Agreement[a]
Teacher quality	2.44	1.29	Disagree
Poor facilities	2.35	1.27	Disagree
Quality of the agriculture curriculum	2.33	1.37	Disagree
Employment opportunities in agriculture	2.28	1.18	Disagree
Quality of agricultural course instruction	2.28	1.36	Disagree
Type of curriculum – too traditional	2.28	1.07	Disagree
Program quality	2.17	1.38	Disagree
FFA Activities	1.56	.62	Disagree

[a]1.00 – 1.49 = Strongly Disagree, 1.50 – 2.49 = Disagree, 2.50 – 3.49 = Uncertain, 3.50 – 4.49 = Agree, 4.50 – 5.00 = Strongly Agree.

As noted in Table 2, respondents agreed or were uncertain on 18 items that were initially considered to be problems to recruitment. Ten were ranked "Disagree." Those 10 items were eliminated from further study as problems for recruitment.

Statements with the highest means centered around registration difficulties (competition from other programs, scheduling difficulties, access to potential students, graduation requirements), support (guidance counselor, administration, and parent), finding time to recruit, and the image of agriculture. Respondents disagreed that FFA activities, program quality, type or quality of curriculum, instructional quality, employment opportunities, facilities, teacher quality, program history, or community support were problems in recruiting students.

In round three, respondents were provided with both their own individual ratings and those of the group from round two. Panel members were asked to provide a dichotomous indication of whether or not they agreed or disagreed that each of the 18 items were indeed problematic to recruitment. They were also asked to provide comments if they could not agree with the summary findings. Twenty-two of the 24 panel members responded in this round for a 91.7% response rate. Table 3 contains summary data for this round.

As shown in Table 3, five of the highest ranked problems associated with student recruitment were scheduling-related. More than three-fourths of the respondents agreed that scheduling difficulties, having time to recruit, students' choices to participate in other programs, access to potential students, competition from other programs, guidance counselor support, graduation requirements, image of agriculture, and no interest in agriculture were recruitment problems. By contrast, less than one-half of the respondents agreed that participation in SAE programs, teachers' commitment to recruiting, or school policies were problems in recruiting students.

Table 3
Delphi Round Three: Level of Agreement with Recruitment Problems Identification (n = 18)

Problem	Agree (%)	Disagree (%)
Scheduling difficulties	86.4	13.6
Time to recruit	81.8	18.2
Students active in other programs, activities, etc.	81.8	18.2
Access to potential students	81.8	18.2
Competition from other programs	81.8	18.2
Guidance counselor support	77.3	22.7
Graduation requirements - not enough time for agriculture course	77.3	22.7
Image of agriculture	77.3	22.7
No interest in agriculture	72.7	27.3
Block scheduling	59.1	40.9
Administrative support	59.1	40.9
Image of the agriculture program	54.5	45.5
Salaries in agriculture	54.5	45.5
Parental support	50.0	50.0
Quality of students in the program	50.0	50.0
School policies	45.5	54.5
Teacher commitment to recruiting	45.5	54.5
SAE participation	41.9	58 .1

Items were once again modified to reflect respondent input and mailed as statements in a fourth-round questionnaire. Again, respondents were given individual and group responses and asked to rate the statements as either "agree" or "disagree." Seventeen of the 24 members returned questionnaires in this final round for a response rate of 70.8%. Table 4 contains the results of this round.

Table 4
Delphi Round Four: Level of Agreement with Recruitment Problems Identification (n = 17)

Statement	Agree (%)	Disagree (%)
Difficulties in scheduling courses to meet graduation requirements and/or college admission requirements are an obstacle to enrolling students in agriculture courses.	94.1	5.9
Teachers do not have time to recruit students.	94.1	5.9
Students are so active in other school activities and programs that they are often prevented from enrolling in agriculture courses.	94.1	5.9
Agriculture teachers are not allowed access to potential students.	94.1	5.9
Other programs in school compete for the same students as does agriculture.	94.1	5.9
Lack of support from guidance counselors is a problem in enrolling students in agriculture courses.	94.1	5.9
Increased graduation requirements do not allow enough time for students to fit agriculture courses into their schedules.	94.1	5.9
The image of agriculture is an obstacle to recruiting students into agriculture courses.	82.4	17.6
The lack of interest in agriculture by many students is an obstacle to their successful recruitment into agriculture courses.	76.5	23.5
Block scheduling prevents students from being able to enroll in agriculture courses.	70.1	29.9
Lack of support from administrators is a problem in enrolling students in agriculture courses.	58.8	41.2
The image of the local agriculture program is a problem in recruiting students into agriculture courses.	58.8	41.2

Table Continues

Table 4 Continued

Statement	Agree (%)	Disagree (%)
Required participation in SAE programs is an obstacle in recruiting students into agriculture courses.	58.8	41.2
Lack of support from parents is a problem in enrolling students in agriculture courses.	52.9	47.1
The perceived quality of students in agriculture courses is an obstacle in recruiting other students into agriculture courses.	52.9	47.1
Policies and practices of local schools are obstacles to recruiting students into agriculture courses.	47.1	52.9
The lack of teacher commitment to recruitment is a problem to student recruitment for courses in agriculture.	47.1	52.9

As indicated in Table 4, scheduling difficulties, finding time to recruit, other school activities, access to students, competition from other programs, guidance counselor support, increased graduation requirements, image of agriculture, non-agriculture student interests, and problems associated with block scheduling were the problems with which at least two-thirds of the respondents agreed. A majority of respondents failed to agree that teacher commitment to recruitment and local school policies were a problem.

Conclusions

The major problems identified by the Delphi technique in the successful recruitment of students into agriculture programs were: scheduling difficulties, finding time to recruit, student involvement in other activities, access to students, competition from other programs, lack of guidance counselor support, increased graduation requirements, image of agriculture, lack of interest in agriculture, and block scheduling.

Implications and Recommendations

In one form or another, seven of the top 10 recruitment problems identified by the Delphi panel deal with scheduling difficulties. From having access to students to counselor support during registration to the actual placement of students in classes, those problems associated with scheduling difficulties comprise the greatest threat to successfully recruiting students into agriculture programs. Image of agriculture and lack of interest in agriculture occupy two additional spots in the top10 problems. If those things that are valued are placed ahead of all else, are agricultural educators to deduce that administrators, counselors, and students do not value agriculture programs? Have agricultural educators failed to adequately convey the scientific and technological nature of agriculture to these clients? A public relations campaign targeting these stakeholders and emphasizing the scientific and technological nature of agriculture is recommended. Agriculture teachers, teacher certification faculty, state department staff, guidance counselors, and administrators should work together to develop a plan to address these issues.

Interestingly, teachers' lack of time to recruit tied for the problem with the highest percentage of respondents in agreement. However teacher commitment to recruiting efforts was not identified as one of the primary problems. This may be interpreted

that teachers are willing to recruit, but lack the time to do so. It may also be construed that teachers do not value recruitment, and therefore do not find the time to recruit. Currently, few teacher preparation programs or teacher inservice programs focus on recruitment issues. According to Dyer and Andreasen (1997), pre-service teachers should be trained in recruitment practices just as they are trained in instructional methods. In a later study by Breja and Dyer (1999), teachers reported that they had received virtually no training in recruitment strategies and techniques. Does a relationship exist between the training received and the perceived importance of recruitment efforts? Further research is needed to answer this question.

Over one-half of the respondents listed the required participation in supervised agricultural experience (SAE) programs as being an obstacle to successful recruitment efforts. While no consensus was obtained, due to the large percentage of respondents who identified SAE as an obstacle, further research is recommended to determine the influence of SAE participation on recruitment efforts. In those programs where SAE participation is an obstacle to recruitment, new alternatives to this experiential learning component are needed.

References

Breja, L.M., & Dyer, J.E. (1999, December). *Attitudes of agriculture teachers, teacher educators, and state staff toward recruitment.* Paper presented at the Annual Meeting of the Agricultural Education Division of the American Vocational Association, Orlando, FL.

Camp, W.G. (1998, December). *Supply and demand for teachers of agricultural education in America.* Paper presented at the Annual Meeting of the Agricultural Education Division of the American Vocational Association, New Orleans, LA.

Camp, W.G., Egan, G., Garton, B., Dyer, J., Flowers, J., Stewart, M., Williams, S., Scofield, G., & Foster, B. (1996, December). *Teacher Recruitment.* Workshop conducted at the American Association for Agricultural Education Meeting, Cincinnati, OH.

Dalkey, N.C. (1969). *The Delphi method: An experimental study of group opinion.* Santa Monica, CA: The Rand Corporation.

Delp, P., Thesen, A., Motiwalla, J., & Seshadri, N. (1977). *Delphi: System tools for project planning.* Columbus, OH: National Center for Research in Vocational Education, Ohio State University.

Dormody, T.J. (1993). Science credentialing and science credit in secondary agricultural education. *Journal of Agricultural Education, 34*(2), 63-70.

Dyer, J.E., & Andreasen, R.J. (1997). Recruitment: An experience in attitude adjustment. *The Agricultural Education Magazine, 69*(5), 6-7, 27.

Dyer, J.E., Lacey, R., & Osborne, E.W. (1996). Attitudes of University of Illinois College of Agriculture freshmen toward agriculture. *Journal of Agricultural Education, 37*(3), 43-51.

Dyer, J.E., & Osborne, E.W. (1997). A comparison of attitudes of students, parents, and counselors toward agriculture and agricultural education. *Proceedings of the 24th National Agricultural Education Research Meeting, Las Vegas, NV, 24,* 93-102.

Graham, S. (1985, March). *Factors related to educational participation among adults*. Paper presented at the Annual Meeting of the Association for the Study of Higher Education, Chicago, IL.

Helmer, O. (1966). *Social technology.* New York, NY: Basic Books.

Hoover, T.S., & Scanlon, D.C. (1991). Enrollment issues in agricultural education programs and FFA membership. *Journal of Agricultural Education, 32,* 2-10.

Iowa Department of Education. (1997). (Iowa Agricultural Education Information). Unpublished raw data.

Johnson, D.M. (1995). Arkansas agriculture teachers' opinions concerning science credit for agriculture. *Proceedings of the 22nd Annual National Agricultural Education Research Meeting, Denver, CO, 22,* 129-140.

McCampbell, W.H. & Stewart, B.R. (1992). Career ladder programs for vocational education: Desirable characteristics. *Journal of Vocational Education Research, 17*(1), 53-68.

Missouri Department of Elementary and Secondary Education. (1998). [Agriculture program enrollment statistics]. Unpublished raw data.

Moore, C.M. (1987). *Group techniques for idea building.* Newbury Park, CA: Sage Publications.

National FFA Organization. (1998, January). *National FFA Organization 1996-97 selected statistics.* Indianapolis, IN: Author.

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

Nichols, T., & Nelson, C. (1993). Hispanics in agriculture: Barriers to educational recruitment. *Proceedings of the 20th Annual National Agricultural Education Research Meeting, Nashville, TN, 20,* 15-21.

North Carolina State University. (1997). *Agricultural education in North Carolina: A status report.* Raleigh, NC: Agricultural and Extension Education.

Osborne, E.W., & Dyer, J.E. (1996). Attitudes of Illinois agriscience students and their parents toward agriculture and agricultural education programs. *Proceedings of the 23rd National Agricultural Education Research Meeting, Cincinnati, OH, 23,* 252-262.

Russell, E.B. (1993). Attracting youth to agriculture: How colleges of agriculture can expand their role. *Journal of Extension, 31*(Winter), 13-14.

Stufflebeam, D.L., McCormick, C.H., Binkerhoff, R.O., & Nelson, C.O. (1985). *Conducting educational needs assessments.* Boston, MA: Kluwer Nijhoff Publishing.

Talbert, B.A., & Larke, A., Jr. (1993). Factors influencing minority and non-minority students to enroll in an introductory agriscience course in Texas. *Proceedings of the 20th Annual National Agricultural Education Research Meeting, Nashville, TN, 20,* 23-30.

United States Department of Education. (1996). *Digest of Education Statistics.* Washington, DC: National Center for Education Statistics.