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A DELPHI STUDY OF AGRICULTURE TEACHER PERCEPTIONS OF PROBLEMS IN STUDENT RETENTION

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Abstract

The objective of the study was to identify the major problems facing high school agriculture teachers in retaining students for secondary agricultural education programs as identified by agriculture teachers. To accomplish this objective the Delphi technique of obtaining group consensus was employed. The study used a series of four mailed questionnaires. The first round of the study used a questionnaire with an open-ended question. In the second questionnaire, respondents were asked to rate the items identified in round one on a five-point Likert-type scale. In the third round panel members were asked to indicate whether they agreed or disagreed with the statements from round two, and to provide comments if they could not agree with the summary findings. The fourth and final round produced concensus on ten of the statements from round three. The major problems identified by the Delphi technique in the successful retention of students in high school agricultural education programs were: scheduling difficulties, lack of guidance counselor support, the image of agriculture, increased graduation requirements, scheduling barriers created by college entrance requirements, competition from other school activities, block scheduling, the image of the local agriculture program, and the quality of the local agriculture instructor.

Introduction

The surging economy and workforce demands in the agriculture sector in the late 20th and early 21st centuries have posed some interesting challenges for agricultural educators. At the forefront of these challenges are the recruitment and retention of high quality students who are likely to enter employment in agriculture.

Whereas some enrollments in agricultural education programs are reported to have surpassed those of the pre-recession era of the late 1970s (Iowa Department of Education, 1999; Missouri Department of Elementary and Secondary Education, 1999; North Carolina State University, 1997), and other regions of the country have experienced enrollment surges, agriculture programs on a national scale continue to face only moderate growth on (National FFA Organization, 2002). Whereas thousands of new students are being recruited into agriculture programs, the number being retained is far below the level needed to maintain a consistent supply of graduates for the agriculture industry. The inability of programs to retain high quality students undermines the ability of educational institutions to supply the national economy with an adequately trained workforce in agriculture (Office of Academic Programs, 1994). According to Goecker, Whatley, and Gilmore (1999), the agricultural sector continues to report an increased demand for, and an annual shortage of, graduates from colleges of agriculture.

Research on the retention of students in agricultural education programs is limited. The current research base focuses primarily on retention at the postsecondary level.

Several researchers have identified predictors of retention, including high school core GPA and learning styles (Garton, Dyer, & King, 1999), and high school rank (Allen, 1997; Murtaugh, Burns, & Schuster, 1999). Dyer and Breja (1999) indicated that experience in agriculture, either from on-farm experience or from enrollment in secondary agriculture programs, as the most effective predictors of student retention at the postsecondary level. However, both Vernon (1996) and Ting and Robinson (1998) noted that other variables are likely to influence student retention.

While these studies have established factors predicting student retention at the postsecondary level, a void exists in the research base in identifying specific barriers to student retention at the secondary level. Furthermore, successful identification of these problems could provide agricultural educators with improved insight into practical strategies for retaining quality students in agricultural education programs and ultimately in their successful entry into the agricultural workforce.

The retention of a diverse student population that includes high quality students continues to be one of the most important and complex problems facing secondary agricultural education programs today. Students who become disillusioned at this level and drop out of high school agriculture programs may never consider enrollment into colleges of agriculture.

Purpose and Objective

The purpose of this study was to develop a consensus document that would identify those problems that serve as obstacles to the successful retention of students in secondary agricultural education programs. The objective of the study was to identify the major problems facing high school agriculture teachers in retaining 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 retaining 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 securing and refining group opinions and substituting computed consensus for an agreed-upon majority opinion.

The population for this study consisted of all high school agriculture teachers. Stufflebeam, McCormick, Binkerhoff, and Nelson (1985) noted the Delphi technique is especially effective in obtaining consensus from a purposively selected group of experts. In selecting the expert judges, state staff and teacher educators from each state were asked to nominate teachers from secondary agricultural education programs that were considered 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 randomly 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 retention 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 categorized 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 20.

The third questionnaire sought to determine consensus. Panel members were asked to indicate whether they agreed or disagreed with each of the 20 statements, and to provide comments if they could not agree with the summary findings. Consensus was reached on eight of the 20 items in this round. A fourth round was initiated in an attempt to reach consensus on the remaining items.

The fourth and final questionnaire also asked the respondents to indicate whether they agreed or disagreed with the 20 statements as modified from round three. Consensus was reached on 10 of the statements in this round.

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

This study sought to identify the major problems facing high school agriculture teachers in the retention of students in high school agricultural education programs. To accomplish this objective the Delphi technique of obtaining group consensus was employed. The first round of the study used a questionnaire with the open-ended question "What are the major obstacles confronting teachers in the retention of students in agricultural education programs?" This type of question was used to facilitate the generation of a wide array of response categories. Thirty-two 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 a summary list of problems identified in round one. The response rate for the first round of the study was 70.8%.

Table 1
Delphi Study Round One: Categories of Retention Problems (n = 17)

Problem Category	*n*
Scheduling difficulties	15
Guidance counselor support	15
Image of agriculture	15
College entrance requirements	15
Competition from other programs in your school	14
Integrating low and high performance students	14
Graduation requirements - not enough time for agriculture courses	12
Students active in other programs, activities, etc.	12
Block scheduling	12
Image of the agriculture program	12
Administrative support	10
Teacher commitment to recruiting	9
Parental support	9
Teacher quality	8
Type of curriculum – too traditional	8
Early dismissal (seniors get part of day off)	7
Maintaining student interest	7
Competition from vocational-technical schools	7
Community support	7
School policies	6
Quality of agriculture course instruction	6
Quality of agriculture curriculum	6
Employment opportunities agriculture	6
Program quality	6
School dropouts (GED)	6
SAE participation	4
Focus of program on leadership	3
FFA activities	3

In round two, respondents were asked to rate the 28 problems identified in round one on a five-point Likert-type scale (1 = Strongly Disagree, 2 = Disagree, 3 = Uncertain, 4 = Agree, 5 = Strongly Agree). Respondents were also asked to make changes in the items to better clarify the problems, if necessary. Seventeen of the 24 individuals comprising the Delphi panel responded in this round for a round two response rate of 70.8%. Results of responses from round two are displayed in Table 2.

Table 2
Delphi Study Round Two: Level of Agreement with Ranked Categories of Retention Problems (n = 17)

Problem	*M*	*SD*	Level of Agreement[a]
Scheduling difficulties	4.12	.93	Agree
Guidance counselor support	3.94	1.30	Agree
Image of agriculture	3.82	.81	Agree
Competition from other educational programs in school	3.82	1.13	Agree
College entrance requirements	3.82	.88	Agree
Integrating low and high performance students	3.76	1.25	Agree
Graduation requirements – not enough time for Ag courses	3.59	1.42	Agree
Students active in other programs, activities, etc.	3.41	1.28	Uncertain
Administrative support	3.29	1.49	Uncertain
Block scheduling	3.19	1.28	Uncertain
Image of the agriculture program	3.12	1.17	Uncertain
Teacher commitment to recruiting	3.06	1.60	Uncertain
School policies	2.94	1.34	Uncertain
Parental support	2.76	1.64	Uncertain
Teacher quality	2.71	1.61	Uncertain
Community support	2.71	1.49	Uncertain
Type of curriculum – too traditional	2.71	1.49	Uncertain
Early dismissal (seniors get part of day off)	2.65	1.32	Uncertain
SAE participation	2.59	1.18	Uncertain
Quality of agriculture course instruction	2.53	1.46	Uncertain
Quality of agriculture curriculum	2.47	1.50	Disagree
Employment opportunities agriculture	2.41	1.06	Disagree
Program quality	2.41	1.46	Disagree
Maintaining student interest	2.35	1.06	Disagree
Competition from vocational-technical schools	2.31	1.14	Disagree
School dropouts (GED)	2.24	1.15	Disagree
Focus of program on leadership	1.88	1.17	Disagree
FFA activities	1.59	.94	Disagree

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

As noted in Table 2, respondents either agreed or were uncertain about 20 of the 28 items in round two. Respondents agreed that six of the items were problems, but expressed opinions categorized as "uncertain" on 14 statements. The items with which teachers most agreed upon as being problems in retaining students in agriculture programs centered around scheduling difficulties, guidance counselor support, dealing with the image of agriculture, competition from other educational programs, meeting college entrance requirements, integrating low and high performance students into agriculture courses, and coping with increased graduation requirements for students. High standard deviations were noted in several problem areas, including parental support (*SD* = 1.64), teacher quality (*SD* = 1.61), and teacher commitment to recruiting (*SD* = 1.60), indicating a high level of variance in

attitudes toward the inclusion of these items as problems to retention.

Respondents disagreed that FFA activities, focus of the program on leadership, opportunity to drop out of school and obtain a graduate equivalence diploma, competition from other vocational-technical schools, maintaining student interest, quality of the agriculture program, employment opportunities in agriculture, or quality of the agriculture program curriculum were problems in retaining students in the program.

In round three respondents were sent their individual and the panel results from round two and asked to provide a dichotomous indication of whether they agreed or disagreed that each of the 28 items were indeed problematic to the retention of students. They were also asked to provide comments if they did not agree with the summary findings. Twenty-one of the 24 panel members responded in round three for an 87.5% response rate. Table 3 contains summary data for round three.

As indicated in Table 3, all respondents considered scheduling difficulties to be a problem to student retention. Likewise, guidance counselor support, student active in other activities and programs, image of agriculture, graduation requirements, and college entrance requirements were listed by over three-fourths of the respondents as problems to student retention. By contrast, less than half of the respondents agreed that community support, quality of instruction, SAE participation, type of curriculum, parental support, school policies, administrative support, early dismissal of students to work, teacher quality, or teachers' commitment to recruiting were problems in retaining students.

Table 3
Delphi Round Three: Level of Agreement with Retention Problems Identification (n = 21)

Problem	Agree (%)	Disagree (%)
Scheduling difficulties	100.0	0.0
Guidance counselor support	95.2	4.8
Students active in other programs, activities, etc.	95.2	4.8
Image of agriculture	85.7	14.3
Graduation requirements- not enough time for agriculture courses	81.0	19.0
College entrance requirements	76.2	23.8
Block scheduling	71.4	28.6
Competition from other educational programs in school	66.7	33.3
Image of the agriculture program	61.9	38.1
Integrating low and high performance students	57.1	42.9
Teacher commitment to recruiting	47.6	52.4
Teacher quality	47.6	52.4
Early dismissal (seniors get part of day off)	42.9	57.1
Administrative support	38.1	61.9
School policies	38.1	61.9
Parental support	38.1	61.9
Type of curriculum – too traditional	38.1	61.9
SAE participation	38.1	61.9
Quality of agriculture course instruction	38.1	61.9
Community support	33.3	66.7

To reflect comments from the respondents in earlier rounds, items were modified and mailed as statements in a fourth-round questionnaire. Panel members were again provided with individual and group responses and asked to provide a dichotomous indication of whether they agreed or disagreed that each of the items were indeed problematic to the retention of students.

Twenty-two of the 24 members returned questionnaires in this final round for a response rate of 91.7%. Table 4 contains the results of this round.

Table 4
Delphi Round Four: Level of Agreement with Retention Problems Identification (n = 22)

Statement	Agree (%)	Disagree (%)
Difficulties in scheduling courses to meet graduation requirements and/or college admission requirements are an obstacle to retaining students in agriculture courses.	100.0	0.0
Lack of support from guidance counselors is a problem in re-enrolling students in agriculture courses.	95.5	4.5
Increased graduation requirements do not allow enough time for students to continue enrollment in agriculture courses.	90.9	9.1
Courses needed to meet college entrance requirements do not allow enough time for students to continue enrollment in agriculture courses.	90.9	9.1
The image of agriculture is an obstacle to retaining students into agriculture courses.	90.9	9.1
Students are so active in other school activities and programs that they do not have time to re-enroll in agriculture courses.	86.4	13.6
Block scheduling prevents students from re-enrolling in agriculture courses.	81.8	18.2
The image of the local agriculture program is a problem in retaining students in agriculture courses.	81.8	18.2
The quality of the local agriculture teacher is an obstacle to keeping students in the agriculture program.	81.8	18.2
The integration of low and high performance students in the agriculture program is a problem in retaining students in agriculture courses.	50.0	50.0
The lack of teacher commitment to encouraging students to remain in the program is a problem to student retention.	40.1	59.9

Table Continues

Table 4 Continued

Delphi Round Four: Level of Agreement with Retention Problems Identification (n = 22)

Statement	Agree (%)	Disagree (%)
Lack of support from administrators is a problem in re-enrolling students in agriculture courses.	36.4	63.6
Local school policies prevent students from re-enrolling in agriculture courses.	36.4	63.6
Lack of support from parents is a problem in re-enrolling students in agriculture courses.	31.8	68.2
Curriculum that is too traditional is a problem in retaining students.	31.8	68.2
Required participation in SAE programs is an obstacle in retaining students in agriculture courses.	31.8	68.2
Low quality instruction discourages students from re-enrolling in agriculture courses.	31.8	68.2
Lack of community support is a problem in re-enrolling students in agriculture courses.	31.8	68.2

As indicated in Table 4, at least 80% of the respondents agreed that scheduling difficulties, lack of guidance counselor support, the image of agriculture in general, increased graduation requirements, scheduling barriers created by college entrance requirements, competition from other school activities, block scheduling, the image of the local agriculture program, and the quality of the local agriculture instructor, were problems in retaining students in high school agriculture programs. Less than one-third of the respondents agreed that lack of support from parents, a traditional curriculum, required SAE participation, low quality instruction, or lack of community support posed problems to the retention of students in high school agricultural education programs.

Conclusion

The major problems identified by the Delphi technique in the successful retention of students in high school agricultural education programs were: scheduling difficulties, lack of guidance counselor support, the image of agriculture, increased graduation requirements, scheduling barriers created by college entrance requirements, competition from other school activities, block scheduling, the image of the local agriculture program, and the quality of the local agriculture instructor.

Implications and Recommendations

Retention of students in high school agriculture programs is imperative to enrollment into college-level agricultural

majors (Dyer, Lacey, & Osborne, 1996). If students become disillusioned and drop out of high school agriculture programs, their interest may not be sparked enough for them to consider enrollment into colleges of agriculture. Those talents are likely to be lost to the agricultural industry.

As indicated by the results of the Delphi technique, five of the nine problems identified were scheduling-related problems. Difficulties in scheduling courses due to increased graduation and college entrance requirements received unanimous agreement from the respondents as being an obstacle to retaining students. The second most agreed upon response was the lack of support from guidance counselors, followed by the problems of increased graduation requirements and meeting college entrance requirements. Teachers and teacher educators need to take a proactive approach to dealing with scheduling problems.

The image of agriculture, the image of the local agriculture program, and the quality of the agriculture teacher were identified as problems in retaining students. Have agriculture programs and teachers been reluctant to divest themselves from the past? While many agricultural education programs have modified their course titles to suggest a more modern or "academic" focus to their curriculum, anecdotal evidence suggests that program structure remains focused around traditional production agriculture subject matter. This may lead counselors, administrators, and/or admission officials to view agricultural education courses as failing to contribute to the academic preparation of students pursuing a college preparatory curriculum. Again, teachers and teacher educators need to take a proactive approach to dealing with these issues.

Problems dealing with program image and teacher quality may indicate a problem with teacher preparation and inservice programs. It is interesting to note that while agricultural education as a whole has made a concerted effort to change its image since the enrollment losses in the early 1980s, the image of agriculture and that of the local agricultural education program still appears to be obtrusive some twenty years later. A generation of teachers has entered and left the profession during this time period, yet image problems still exist. If real change is to be made, it is likely that change will begin with the preparation of teachers in teacher education programs. These programs should assume an active role in preparing teachers to develop positive program and professional images. In addition, further research should be initiated to formulate practical solutions to the image problems of agricultural education programs for the new millennium.

Block scheduling was identified as a problem to retention. This was an unexpected finding since a purpose of block scheduling is to make courses more accessible to students. One of the lauded benefits of the block scheduling model is its complimentary nature, that is, the ability to allow students to meet increased graduation and university admission requirements, yet still be able to enroll in elective courses such as agricultural education (Weller & McLeskey, 2000). Why have agricultural education programs failed to flourish using this type of scheduling? Have agricultural educators failed to adapt to the changing needs and expectations of college-bound students? Additional research is needed in this area to further define the limitations of block scheduling and/or teacher attitudes toward integrating agricultural instruction into block scheduling. In addition, further study is needed to develop a curriculum-based model for agricultural education that allows courses to be scheduled around the curricular needs of students.

Interestingly, items such as parental and community support were not viewed as problems to the successful retention of students. Agriculture teachers could draw upon and target this support in helping to address those areas identified as problematic. In addition, teachers could likely gain much in terms of support and understanding by teaming with teachers of science, math, and English, social studies, etc.

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