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A Question of Relevance: FFA Programs and Services as Perceived by FFA Members and Non-Members

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Abstract

The purpose of the study is to determine if there is a difference between FFA members and non-members as to their perception of FFA programs and services, and to determine if students' perceptions of FFA programs and services are influenced by gender and ethnicity, enrollment choice, prior enrollment in an agriculture class, block scheduling, grade level and extracurricular activities.

Data were collected using a questionnaire administered to 404 students enrolled in the Agriscience Applications course in 27 schools in North Carolina. It can be concluded that: A student's decision to join or not join the FFA is influenced by their perception of FFA programs and services. A student's gender, ethnicity, enrollment choice, prior enrollment in an agriculture class, block scheduling, grade level and extracurricular activities do not influence their perceptions of the FFA programs and services.

The implications are significant for the FFA and agricultural education in that students tend to join and participate in the FFA based upon the organization's ability to meet a student's need for a sense of belonging. The FFA should continue to seek ways to involve all members in positive personal growth activities that allow students to experience that sense of belonging. Based upon the responses of members, the social aspects of the organization were motivating factors in their desire to be members.

Introduction

Does the FFA provide relevant programs and services to its members? In a review of selected FFA programs, it was noted that member participation had declined in North Carolina in selected career development events, scholarship programs, Agriscience student awards, and other individual award areas (North Carolina FFA Association, 1998). Because many FFA activities require student participation at the local level before advancing to state and national levels, this decline in state level participation may be indicative of less involvement by students in FFA activities at the local level.

The National FFA Organization and similar organizations in other states should consider membership numbers to be a potential predictor of a student's perception of the relevance of the organization (Sirkin and McDermott, 1995). If this is true, then the FFA must make substantial programmatic changes in order to more effectively satisfy students' interests and needs. One potential objection that may be offered by non-members is that FFA programs and services are not worth the financial investment one has to make in order to be an FFA member. Sirkin and McDermott (1995) contend that members will desire to maintain their membership in an organization if they perceive that it is worth at least the value of membership dues.

Although some non-members might offer the argument that they cannot afford the cost of FFA dues, it is important to note that FFA membership dues on the state and national levels have not significantly increased. From 1928 to 1969, the total cost for national FFA dues increased from ten cents per member to 50 cents per member. From 1969 to 1989, national FFA dues increased from 50 cents per member to $3.00 per member. State FFA dues have increased in a similar fashion. From 1984 to 1995, state FFA member dues increased from $2.50 per member to $4.50 per member. In 1999, state and national dues were $4.50 and $5.00 respectively (North Carolina FFA Association, 1998). For these dues, an FFA member can expect to receive the official magazine of the National FFA Organization, The FFA New Horizons Magazine, an official membership card, eligibility to apply for FFA scholarships, eligibility to participate in FFA career development events, individual member awards programs and other local FFA activities and programs.

Theoretical Framework

Maslow introduced the concept of self-actualization in his book, Motivation and Personality. Maslow believed that the human individual is an integrated organism. It is impossible to separate the various components of a person's self. When an individual experiences hunger, it is their whole self that is hungry and not just selected physiological components. It is the whole person that has the desire for food, shelter and safety.

Until the basic physiological needs are met, the human is motivated to satisfy these needs. Once basic physiological needs are met, a different set of needs become evident. Maslow referred to these as the safety needs and characterized them as stability, security, and protection from harmful external conditions. If both the physiological and safety needs are met, then love and affection needs emerge. Maslow categorized these needs as the need for contact and intimacy.

The next level of need is identified by Maslow as the esteem needs. These needs are characterized by a person's desire for status, fame, dominance, and importance. These needs will lead the individual to feel self-confident, worthy and useful in their environment. Individuals deficient in this need will experience feelings of helplessness and weakness.

At the top of the hierarchy is self-actualization. Even if all of the other needs are met, the individual will develop a sense of restlessness and discontentment unless he or she is accomplishing goals true to oneself (Maslow, 1970).

The various levels of the hierarchy are ordered such that almost everyone proceeds instinctively through them in the same order. Maslow's original hierarchy has been adjusted to include two additional tiers between the esteem needs and self-actualization. Resting upon esteem needs are cognitive needs characterized by a person's search for knowledge and understanding. If these needs are met, the individual progresses to aesthetic needs that are identified as a person's desire for order and beauty. (Weiten, 1989). Maslow suggested that an individual progresses through this hierarchy in the order described. However, the order may be rearranged as a result of an individual's experiences. By suggesting this, Maslow recognized the biological and social bases of human motivation (Weiten, 1989). Maslow's Hierarchy of Needs has proven to be influential in the discussion of human motivation.

Maslow's Hierarchy is relevant to this study in that it offers a basis for understanding potential reasons why students join and participate in youth organizations, namely the FFA organization. If students are motivated by self-esteem, a sense of belonging, a desire for status, and a need to feel important, then this theory may explain why students tend to join and participate in the FFA organization.

In addition to Maslow's Theory, the Expectancy-Value Theory conceptualizes the motive behind a student's decision to participate in FFA activities. FFA programs and services are directed toward helping students achieve their goals. For achievers, FFA activities should be challenging and maintain a high level of interest without being unattainable. For students motivated by a need to avoid failure, FFA activities should be provided at multiple difficulty levels so students do not become discouraged (McClelland, 1955).

The Effectiveness of FFA Programs in Meeting Students' Needs

Weatherford (1984) reported that students perceived a higher need for safety, legitimacy and self-worth, a higher sense of identity, and a stronger need to participate in society than was perceived by their respective vocation student organization advisors.

Shinn and Vaughn (1993) found that the national FFA organization should develop new career development events based upon emerging student interests and agricultural technologies. Furthermore, recognition programs should be periodically reviewed to determine their effectiveness in motivating students and the FFA should continue its efforts to promote ethnic and gender diversity in its membership. Finally, the study found that the national FFA organization should develop strategies for encouraging participation at all levels of the organization: local, state and national.

Wingenbach and Kahler (1997) found that a positive relationship existed between a student's perception of his or her leadership and life-skill ability and participation in FFA leadership activities. In addition, Turner and Herren (1997) concluded that agricultural education students who join the FFA had a higher need for achievement, affiliation and power than non-members did. Furthermore, African American students had a higher need for power, achievement and affiliation than Caucasians and others. Female agricultural education students had higher needs for affiliation and power than their male counterparts.

Rossetti, McCaslin, and Gliem (1996) examined the factors influencing students' decisions on whether to become FFA members. Students who were members of the FFA reported that assistance in achieving future career goals and other goals, interest in FFA activities and programs and the enjoyment derived from them, and leadership skill development were major reasons for being a member. Non-FFA members responded in the study by saying that they did not have enough time for FFA activities and having more important things to do as major reasons for not joining the FFA.

One major reform initiated in North Carolina in recent years is the implementation of block scheduling in high schools. Becton (1996) investigated the impact of block scheduling on FFA programs and activities and found that teachers believe that block scheduling has a deleterious effect on FFA member recruitment and retention. Furthermore, block scheduling was perceived to have little impact on classroom instruction or supervised agricultural experience. Communication between teachers and students not currently enrolled in agriculture classes was identified as a major problem. Wortman (1997) found that students who did not serve in official leadership positions in the local FFA chapter had no significant positive or negative perception regarding block scheduling and its impact on FFA activities. Students who served as FFA officers reported that block scheduling negatively influenced student participation in FFA activities.

Diversity Issues and FFA Membership

The traditional method of delivery for FFA programs may influence the non-traditional student's decision to participate in these programs. Sutphin, Newsom-Stewart (1995) found that males were influenced to enroll by peer pressure more than females, and were more apt to study agriculture in order to escape academic courses such as foreign language. Females were more inclined to enroll for the purpose of developing team and life skills (Sutphin, Newsom-Stewart, 1995).

Garton, Thompson and Cano (1997) found that a majority of students preferred introversion, sensing, feeling and judgment learning preferences. Conversely, teachers preferred active learning as evidenced by extroversion, intuitive, thinking and judgment learning preferences. They concluded that while teachers focus on achievement and competition, many students tend to avoid competition. Teachers who use FFA competitive events as a recruitment and retention strategy may need to proceed with caution. The structure of FFA competition is such that students may be discouraged from joining the FFA.

Research Questions

The purpose of the study is to determine the factors influencing a student's decision to join or not join the FFA. The specific research questions are:

1. Is there a difference between FFA members and non-members as to their perceptions of the effectiveness of FFA programs and services to meet an individuals needs for premier leadership, personal growth and career success?
2. Are students' perceptions of FFA programs and services influenced by gender, ethnicity and FFA membership status?
3. Are students' perceptions of FFA programs and services influenced by enrollment choice, prior enrollment in an agriculture class and FFA membership status?
4. Are students' perceptions of FFA programs and services influenced by block scheduling and FFA membership status?
5. Is there a relationship between a student's grade level and their perceptions of the value of FFA programs and services?
6. Is there a relationship between the number of clubs and formal athletic activities in which a student participates and their perceptions of FFA programs and services?

Research Procedures Used

The population for this study is first year students of agricultural education who were enrolled in the Agriscience Applications course in North Carolina schools. Four hundred and four students were selected for the study based upon the geographic region in which their school is located. Schools selected for this study all had FFA chapters and were categorized as having 33% or less FFA membership, 34-66% membership, or 67-99% membership.

Because this is descriptive research, a questionnaire was developed based upon a series of FFA program characteristics. Participants were asked to respond by indicating their agreement with a series of 18 statements regarding the image of the FFA. The response choices and their numerical values are as follows: Strongly Agree = 4, Agree = 3, Disagree = 2, Strongly Disagree = 1, and Do Not Know = 0. The midpoint of this scale was 2.5, and all mean scores above this number were interpreted be in agreement with the item. All mean scores below 2.5 were considered to be in disagreement with the item and items with a mean score of 2.5 were interpreted to represent a neutral opinion.

The scaled items were derived from the objectives of the FFA Local Program Success Model (National FFA Organization, 1997a). The Local Program Success Model was created and developed by experts in agricultural education for the purpose of improving local agricultural education programs. The researcher's graduate advisory committee, as a panel of experts in agricultural education and FFA, identified additional items to be included in the survey instrument and modified some items derived from the Local Program Success Model. The instrument was field tested and yielded a Cronbach's Alpha score of 0.88.

The data were collected and tabulated using Microsoft Excel® and transferred to the Statistical Package for Social Sciences (SPSS) 8.0 for Windows®. The first procedure involved an analysis of descriptive statistics in order to have a clear profile of the sample. Descriptive statistics were generated for gender, ethnicity, grade level, prior enrollment, enrollment choice, block schedule characteristics of the school, FFA membership status, and number of clubs in which survey respondents held membership.

The next procedure involved an analysis of the first research question. A multivariate analysis was used to examine the 18 items simultaneously and if differences were determined to exist between FFA member and non-member perceptions, one-way analyses of variance determined which items accounted for the overall differences.

Prior to any multivariate analyses, the dependent variables were compared using the Pearson Product Moment Correlation statistic to determine if a significant correlation existed between the scaled items on the survey instrument. Hotelling's Trace was the method for determining the level of significance in each multivariate analysis. The next procedure involved a multivariate analysis of variance test to determine if students' perceptions of FFA programs and services were influenced by selected demographic and school characteristics as described in research questions two through four. For those multivariate analyses that yielded significant differences in the main effects of independent variables, a one-way analysis of variance was performed to pinpoint any significant differences.

In addition, the Pearson Product Moment Correlation statistic was used to answer research question five by determining if a relationship existed between the grade level of students and the students' perception of FFA programs and services and question six by determining if a relationship existed between the number of clubs in which students were members and their perceptions of FFA programs and services.

Findings

The majority of study participants were males, constituting 76 % of the data sample. In all, there were 308 males and 96 females in the data sample. Females comprised 22.6 % of the members and 24.5 % of the non-members in the study. Of all participants in the study, 41.5 % indicated that they were FFA members and 58.5 % were non-members. Two hundred ninety nine Caucasian students and 102 non-Caucasian students participated in the study. To ensure the confidentiality of students responses, all ethnic groups except Caucasian were combined for data analysis.

Freshmen made up 51.7 % of the students in the survey while seniors were the fewest number of students in the sample, comprising only 5.7 % of the sample. With respect to club participation, 34% of respondents indicated that they were not members of any club or school organization and did not participate in any kind of extracurricular athletic sport. This constituted the largest number of responses in the sample. More FFA members participated in clubs and athletic activities than non-members.

Participants in the study were also asked to provide data regarding their choices in signing up for Agriscience Applications. The majority of students reported that they signed up for the class by their own free will and that this was their first agriculture class. Eighty nine percent of the students in this study report that their school is on a block schedule system.

Perceptions of FFA Members and Non-members Toward FFA Programs and Services

A multivariate analysis was performed using as the dependent variables the items on the instrument designed to measure students' opinions of FFA programs and services. The independent variable was FFA membership status. This analysis yielded a Hotelling's Trace value of 0.210 (p<.05). Therefore, a significant difference exists between FFA members and non-members with regard to their opinions of FFA programs and services.

Tables 1 and 2 show the responses of members and non-members with respect to their opinion of the effectiveness of FFA programs and services in meeting their needs for leadership, personal growth and career success. Most FFA members in the study agreed with the concept that the FFA teaches necessary leadership skills, producing a mean score of 3.18 (SD = 0.51) for this item on the instrument. FFA members agreed in their opinions as to the effectiveness of the FFA in teaching communication skills, although the mean score for this item was slightly less at 3.15 (SD = 0.60). Furthermore, the majority of FFA members agreed with the idea that traditional FFA leadership topics such and parliamentary procedure and public speaking are interesting, producing a mean score for this item of 2.73 (SD= 0.81). Non-members rated leadership topics such as parliamentary procedure and public speaking lowest among this series of items (M=2.5, SD=0.84). The most favorable response from the non-members was in the FFA organization's ability to help students learn communication skills (M=2.90, SD=0.67). Table 1 reports the responses of students to the FFA programs and services items related to leadership development, Personal Development and Career Development Programs.

The FFA members in the study rated the ability of the FFA to help people with their educational goals highly (M=3.17, SD=0.58). The FFA members reported that FFA programs offer a great opportunity for travel (M=3.16, SD=0.59). For the majority of members, FFA programs build self-confidence (M=3.13, SD=0.58) and recognize members for their achievements (M=3.00, SD=0.68). Finally, members agreed with the idea that the FFA helps students improve their grades in school (M=2.92, SD=0.77).

Non-members in the study reported a significantly lower opinion of the FFA's ability to help students with their educational goals (M=2.93, SD=0.71), and with the concept that FFA can help students improve their grades in school (M=2.62, SD=0.73). Furthermore, non-members in the study reported significantly lower opinions of the FFA organization's ability to offer important personal growth opportunities through its travel (M=2.84, SD=0.76) and award programs (M=2.66, SD=0.77).

Table 1. *Perceptions of Members and Non-Members Regarding FFA Leadership, Personal Development and Career Development Programs*

Survey Instrument Items	Members (n=168)		Non-Members (n=236)		F
	Mean	Std. Dev.	Mean	Std. Dev.	
The FFA provides help in choosing a career.	3.25	0.52	2.98	0.64	17.41*
The FFA teaches leadership skills necessary for success in life.	3.18	0.51	2.89	0.74	16.13*
The FFA helps people with their educational goals.	3.17	0.58	2.93	0.71	11.18*
The FFA offers students with a great opportunity to travel.	3.16	0.59	2.84	0.76	16.78*
FFA activities help students learn to communicate better.	3.15	0.60	2.90	0.67	11.63*
The FFA helps students be more self-confident.	3.13	0.58	2.96	0.71	5.34*
FFA activities help students made better decisions regarding school and work.	3.10	0.67	2.90	0.68	6.47*
FFA members get a lot of attention when they win awards.	3.00	0.68	2.66	0.77	16.38*
The FFA encourages students to get a job in the agriculture industry.	2.97	0.68	2.90	0.67	0.95
FFA activities help students improve their grades.	2.92	0.77	2.62	0.73	11.18*
The FFA leadership topics like parliamentary procedure and public speaking are interesting.	2.73	0.81	2.50	0.84	5.63*

*p<.05.1=Strongly Disagree, 2=Disagree, 3=Agree, 4=Strongly Agree

The FFA members in the study agreed with the idea that the FFA does indeed help students make career choices (M=3.25, SD=0.52). Furthermore, FFA members in the study reported that the FFA helps students to made better decisions whether it involves school or career choice (M=3.10, SD=0.67). Non-members in the study provided significantly lower mean scores in their opinion that the FFA helps students make better academic and career choices (M=2.90, SD=0.68).

Table 2 shows the responses of members and non-members regarding their opinions of FFA programs overall. FFA member's opinions did not rank very highly in this particular section when compared to their scores on previous items. The FFA members agreed that FFA activities were held at a convenient time and location(M=2.72, SD=0.73) and that these activities were adequately publicized (M=3.03, SD=0.73). The non-members in the study held significantly lower opinions of the idea that FFA activities are held at a convenient time and location (M=2.51, SD=0.81) and were well publicized (M=2.80, SD=0.80). Based upon the analyses performed to address the second research question, this research shows that significant differences do exist between the perceptions of FFA members and non-members as to their opinions of FFA programs and services.

Table 2. *Perceptions of Members and Non-Members of Overall Programs and Services*

FFA Personal Development Items	Members (n=167)		Non-Members (n=236)		F
	Mean	Std. Dev.	Mean	Std. Dev.	
FFA activities seem to be well organized and publicized.	3.03	0.73	2.80	0.80	6.95*
FFA activities such as contests are too complicated for me.	2.96	0.82	3.14	2.67	.058
FFA activities are held at a convenient time and location for me to attend.	2.72	0.73	2.51	0.81	5.15*

*$p<.05$. 1=Strongly Disagree, 2=Disagree, 3=Agree, 4=Strongly Agree

Students' Perceptions of FFA programs and services and FFA Programs and Services as Influenced by Selected School and Demographic Factors

There were no significant differences identified in the interaction effects between FFA membership status, gender and ethnicity. The results of the analysis did once again indicate a significant difference between the mean scores of FFA members and non-members. FFA membership status and prior enrollment and enrollment choice in an agriculture class had no significant effect the opinions of students. A school's block scheduling status did not significantly influence the respondents' opinion of the FFA programs and services. Furthermore, the interaction effect of FFA membership status and block scheduling did not yield significant differences.

A Pearson Product Moment Correlation Coefficient of 0.076 (p=.13) for the correlation between FFA organizational image and the respondent's grade level was generated. Based upon these results, there is not a significant relationship between the respondents' grade level and their opinions of FFA programs and services. Another Pearson Product Moment Correlation was computed to test the significance of the relationship between the respondents' level of participation in school organizations on their opinions of FFA programs and services. A correlation coefficient of 0.09 (p=.15) for FFA programs and services was generated. There was no significant relationship found between the respondents' level of participation in school organizations and their opinions of FFA programs and services.

Conclusions

Conclusion I: A student's decision to join or not join the FFA is influenced by their perceptions of the effectiveness of FFA programs and services in their school

FFA programming makes a difference in a student's decision to join the FFA. In general, FFA members' responses to items related to the effectiveness of FFA programs and services were significantly more positive than the responses of non-members. However, it must be noted that non-members did perceive some FFA programs and services to be of value even though they chose not to become members.

Conclusion II: A student's gender and ethnicity do not influence their perceptions of FFA programs and services

Students' responses to items on the questionnaire were not significantly influenced by gender and ethnicity. The FFA has developed numerous recruiting materials in recent years that not only represent the current ethnic and gender characteristics of the membership, but also portray what FFA membership could be if it were more diverse in ethnicity and gender.

Conclusion III: Voluntary enrollment in an agriculture class and prior enrollment in an agriculture class does not influence a student's perceptions of FFA programs and services

This study did not find that student's enrollment choice or prior enrollment in an agriculture class made a significant difference in their decision to join or not join the FFA. Students who are involuntarily enrolled in an agricultural class may not necessarily be adverse to joining the FFA, just as students who voluntarily enroll in an agriculture class are not necessary motivated to join the FFA. This study did not find that prior enrollment in an agriculture class significantly influenced over a student's decision to join or not join the FFA. Even though a high number of students with prior enrollment experience were part of the study, this did not have a significant effect on the results.

Conclusion IV: Block scheduling does not influence a student's perceptions of FFA programs and services

Once considered to be an obstacle in the planning and implementation of FFA activities (Becton, 1996), block scheduling did not influence students' decision to the extent that it either encourages or discourages membership. North Carolina schools have been utilizing block scheduling for a number of years, and perhaps FFA advisors have begun to effectively recruit and retain FFA members under the system. Because a low number of students were on a traditional schedule, it would be imprudent to generalize the results of the analysis of this research question to the entire population of students that were enrolled in Agriscience Applications in the spring of 1998.

Conclusion V: Grade level does not influence a student's perceptions of FFA programs and services

This study did not find that grade level was a significant influence on the opinions of students regarding FFA programs and services.

Conclusion VI: The scope of participation in school clubs and formal athletic activities does not influence a student's perceptions of FFA programs and services

The scope of participation in school clubs and organizations might be effective in characterizing the students who might join and participate in FFA activities, but it does not singularly affect a student's opinions of the FFA organization's image and FFA programs and services.

Implications and Recommendations

The results of this study are supported in the literature by Maslow (1970) and McClelland (1955). At an age when most students are becoming eligible for FFA membership, they are also entering a period of human growth and development characterized by a need for contact, intimacy, a sense of belonging and achievement. The implications are significant for the FFA and agricultural education in that students tend to join and participate in the FFA based upon the organization's ability to meet a student's need for self-esteem. The FFA should continue to seek ways to involve all members in positive personal growth activities that allow students to experience that sense of belonging. Based upon the responses of members, the social aspects of the organization were motivating factors in their desire to be members. The FFA members in this study tended to believe that the FFA provides an equal opportunity for all students to participate in and benefit from its programs, and that many of their friends were members of the FFA. However, the students today are not necessarily interested in some of the traditions of the FFA.

Overall, FFA members believe that the FFA provides valuable assistance in helping students choose a career and also helps students achieve their educational goals. Many of the programs and services offered by the FFA are designed to encourage individuals to succeed. For students motivated by achievement, FFA activities are available that are challenging and can maintain a high level of interest without being unattainable. For those students that are motivated by a desire to avoid failure, the FFA provides programs and services with multiple difficulty levels so that students do not become discouraged. Although FFA members in the study tended to believe that the FFA has an overall positive image, they also tended to score FFA programs and services lower. As a result, the FFA might wish to commit resources to the development of new products and services that more closely parallel students' interests and needs.

Non-members generally held a lower opinion of FFA programs and services than FFA members. Perhaps the slow evolution of FFA career development events and other awards programs in North Carolina has caused the FFA to fall behind in technology, therefore driving away students who might otherwise be interested in becoming a member. The FFA organization may be able to recruit new members if they offer activities that meet and exceed the expectations of non-members. The FFA organization's educational programs could be revised to permit a closer relationship with instruction in the agricultural sciences. Learning activities could be packaged in a way that creates value beyond the cost of FFA membership dues.

The findings that emerged from this study led to certain recommendations pertaining to future research. Additional research is suggested in the area of FFA programs and services. An in-depth study into the various programs such as career development events, proficiency awards, and scholarships, would identify potential areas of weakness. Although FFA members indicated that FFA programs and services helped them reach their educational and career goals, additional research is needed to determine which programs are more effective.

To assist with recruitment and retention, additional research should be conducted into determining the most effective methods for planning and implementing FFA activities. These results might be particularly useful to teacher education responsible for preparing agriculture teachers for field service.

One general recommendation emerged from this study. It is recommended that the National FFA Organization create within its business structure a research and development division. The purpose of this new division would be to constantly evaluate the effectiveness of the FFA in achieving its mission and goals, and to provide research findings to state FFA associations and state agencies responsible for agricultural education programs. Regardless of the method employed by the National FFA Organization, it is essential that an ongoing evaluation process be in place and operational.

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The Self-Perceived Impact of Participation in the Texas 4-H Council by Former Council Members

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Abstract

This paper discusses the self-perceived impact of participating in the Texas 4-H Council by former council members. The impact was determined by the members' educational attainment, career choice, and community involvement. The study helped create a basic profile of Texas 4-H Council members and identified the educational strategies, career choices, and community involvement that contributed to the success of these 4-H members. This information should provide feedback to the Texas Agricultural Extension Service (TAEX) on the success of its educational programs and in turn allow TAEX officials to provide better and more effective programs.

Introduction and Theoretical Framework

Young men and women who traditionally attain the highest levels of achievement in 4-H programs are typically very successful in other aspects of life as well (Weber & McCullers, 1986). Boyd, Herring, and Briers (1992) stated that the level of 4-H participation was a significant predictor of leadership life skills development scores among 4-H youth in Texas. They observed higher leadership life skills development for 4-H members than non-members.

Membership in the Texas 4-H Council is the highest level of leadership attained at the state level in this organization. The Texas 4-H Council consists of two member delegates from each District 4-H Council and elected delegates-at-large. These members provide leadership at state events and act as a sounding board to identify needs and interests of 4-H youth, suggest and explore action programs that will meet the needs and interests of youth, and to advise in the determination of future 4-H programs. With this high level of leadership it would suggest that members of the Texas 4-H Council should have higher life skills development.

Leadership life skills development has been and continues to be a major goal of most youth programs. The 4-H youth development program of the Cooperative Extension Service is no exception (Dormody & Seevers, 1994).

As the world enters the 21st century many youth programs, including 4-H are focusing on the effectiveness of their leadership training. A general perception prevails that participation in a variety of activities or programs such as public speaking or holding office develops leadership life skills and self-understanding (Dormody & Seevers, 1994).

Rockwell’s (1981) survey of Nebraska 4-H alumni revealed that over 90% of the respondents felt that the leadership experiences they had as members were helpful in some degree in preparing them for adult leadership roles. Benefits cited most frequently included learning a specific skill and having a chance to meet people. Other helpful experiences noted included public speaking experiences, competitive opportunities, project experiences, and preparation for occupations. Also, 4-H alumni were found to be more likely to become involved in community activities than non-alumni (Miller, 1987).

Cox (1988) found that leaders tend to be more highly educated than the general population and have strong family origins both in terms of spending their childhood in traditional families with both parents and in terms of their current marital status. They also have been active in organizations and their communities as youth and have mentors, role models, and other nurturers.

The 4-H Leadership Project Leader Guide states that the purpose of the 4-H Leadership Project is to teach life skills necessary for effective leadership. The project is based on the rationale that every person needs leadership skills during his lifetime--to become a leader or have control over his own personal life, to provide leadership as parents and to provide leadership in groups. Lastly, this project is based on the rationale that every person has potential leadership abilities and that leadership skills can be learned (4-H Leadership Project Leader Guide, 1994).

A study of recent officers of Michigan state vocational organizations to determine the usefulness of state officer leadership training for later life demonstrated that personal facilitation skills such as communication, social etiquette, time and racial equity were used most frequently by former officers in all organizations (Peterson, 1984). Studies by Bass and Stogdill (1981) indicated that leadership exhibited in organizations at the high school level may persist in college and in later vocational, professional, and community life.

The 4-H organization is one of the oldest and largest experiental education programs for youth in the United States. From its beginning, the 4-H program has used a system of clubs and competitive activities to promote learning and the development of the specific skills of 4-H members (Ladewig & Thomas, 1987).

Conrad and Hedin’s 1981 study showed that youth involved in experiential education programs entered into more meaningful relationships with adults, experienced more positive attitudes and behaviors, and placed a value on community participation. In addition, the youth also reported having developed more positive attitudes toward careers with better self-concepts and self-esteem in relation to others.

While the basic purpose of the 4-H program was originally the development of boys and girls for farm life, today's 4-H program is designed to enhance the development of responsible and capable citizens, regardless of homelife or family background (Kelsey & Hearne, 1963).

Purpose and Research Questions

The purpose of this study was to determine the self-perceived impact of participation in the Texas 4-H Council by former members of the Council. The impact was determined by the members' educational attainment, career choice, and community involvement. As a means of accomplishing this purpose, answers to the following questions were sought:

1. What is the demographic profile of former Texas 4-H Council members?

2. What was the Texas 4-H Council's impact on the educational attainment of its members?

3. What was the Texas 4-H Council's impact on the career choices of its members?

4. What was the Texas 4-H Council's impact on the community involvement of its members?

5. What was the overall effect of serving on Texas 4-H Council?

Methods and Procedures

The population for the study was Texas 4-H Council members from 1979-1989. A mailed questionnaire, prepared in part by the researcher using the Total Design Method (Dillman, 1978), was used as the data collection instrument. A panel of experts in the Department of Agricultural Education and Communications at Texas Tech University, and former Texas 4-H Council members from years other than 1979-1989, were used to determine reliability and validity of the instrument.

One hundred sixty-nine people were sampled from the population of 300. Names were randomly selected from a list provided by the State 4-H Office. Individuals selected for the sample were surveyed starting December 17, 1999 and continuing through the first week of March 2000. Fifty-four percent of the people sampled responded to the survey.

Table 1. *Scope of the Study*

	Number of Surveys Mailed	Number of Surveys Available for Response	Number Responded	Percent Responded
Texas 4-H Council Members, 1979-1989	169	130[a]	92	70.8

[a]39 surveys were returned with comments such as no forwarding address on file, deceased, address unknown, etc.

Table 1 illustrates the scope of the study. One hundred sixty-nine addresses were obtained from the State 4-H office. Of this 169, 39 were returned with comments such as no forwarding address on file, address unknown, deceased, etc. This reduced the number of potential respondents to 130. Of the 130, 92 responded for a response rate of 70.8 percent.

Survey instrument responses were coded and transferred into a computer file for analysis. Statistical analysis of the data files was completed using SPSS for the Macintosh. Descriptive statistics were used to summarize the data pertaining to: (a) the demographics of the former Texas 4-H Council members, (b) educational attainment of the former Texas 4-H Council members, (c) the career choices of the former Texas 4-H Council members, and (d) the community involvement of the former Texas 4-H Council members.

Results

The majority of the respondents were male Caucasian/Americans. Most of them grew up on a farm or ranch or in a rural area. Over eighty percent of them were married and one-third of their spouses grew up on a farm or ranch, while another one-fourth of the spouses were at the other end of the spectrum being raised in a city of more than 50,000 people.

All of the respondents attended college with one-third attending Texas Tech University and slightly over one-third attending Texas A&M University. Most of the respondents had a
GPA of 2.5 or better with just under half having between a 3.0 and a 3.5. Slightly over one-fourth had a 3.5 or higher.

Table 2 includes data regarding the highest level of education completed by the respondents. Over half (57.1%) received a bachelor's degree. More than one-fourth (28.6%) had a master's degree and 7.7% had a doctoral degree. Less than 5 percent (4.4%) reported having an associate degree and 2.2% completed some college.

Table 2. *Highest level of education completed by respondents*

Level	Frequency	Percentage
Some college	2	2.2
Associate degree	4	4.4
bachelor's degree	52	57.1
master's degree	26	28.6
doctoral degree	7	7.7
TOTAL	91[a]	100.0

[a]N=92, one missing response

The majority (62.3%) of the respondents either agreed or strongly agreed that serving on the Texas 4-H Council influenced their decision to attend college. Over one-half (52.8%) of the respondents also agreed or strongly agreed that serving on Council affected their decision on what college to attend. All respondents agreed or strongly agreed that they were satisfied with the college they attended.

Table 3 indicates former Council member's responses to the statement, "I believe the Texas 4-H Council contributed to my college success." A large majority either agreed or strongly agreed. About 40% strongly agreed and 46.2% agreed. Only 4.4% disagreed and 1.1% strongly disagreed; 7.7% were uncertain.

Table 3. *Response to statement "I believe the Texas 4-H Council contributed to my college success*."

Amount of Agreement	Frequency	Percentage
Strongly Agree	37	40.7
Agree	42	46.2
Uncertain	7	7.7
Disagree	4	4.4
Strongly Disagree	1	1.1
TOTAL	91[a]	100.0

[a]N=92, one missing response

One of the variables included in the study was the current occupation of the respondent. Table 4 indicates that the largest percentage (28.6%) of respondents were in the education, communications, or information specialist cluster. Slightly less than one-fifth (18.7%) were a manager or financial specialist, about one-sixth (16.5%) were involved in marketing, merchandising, or sales, and 6.6% were involved in production agriculture. Only 3.3% were a scientist, engineer, or related specialist. Over one-fourth had occupations that did not fit in any of these categories.

Table 4. *Current occupation of respondent*

Occupation	Frequency	Percentage
Scientist, Engineer, or Related Specialist	3	3.3
Manager or Financial Specialist	17	18.7
Marketing, Merchandising, or Sales Representative	15	16.5
Education, Communications, or Information Specialist	26	28.6
Agricultural Production Specialist	6	6.6
Other	24	26.4
TOTAL	91[a]	100.0

[a]N=92, one missing response

Table 5 reflects the respondents' annual gross income. Less than one-tenth (8.1%) of the respondents made less than $20,000, 7% made between $20,000 and 24,999, and 8.1% made between 25,000 and 29,999. Less than one-sixth (15.1%) of the respondents reported earning between $30,000 and $34,999 and the same percentage were earning between $35,000 to $39,999. The largest percentage (16.3%) of respondents earned between $40,000 and $49,999 and the same percentage earned above $80,000. There were 3.5% earning $50,000 to $59,999, 8.1% made $60,000 to $69,000, and only 2.3% made $70,000 to $79,999.

In Table 6, respondents were asked to respond to the statement, "I believe the Texas 4-H Council has contributed to my career success." A large majority either agreed or strongly agreed with the statement. Sixty percent strongly agreed and 30% agreed. Only 2.2% disagreed and 1.1% strongly disagreed. Less than one-tenth (6.7%) were uncertain.

Table 5. *Annual gross income of respondents*

Income	Frequency	Percentage
Below $20,000	7	8.1
$20,000 to $24,999	6	7.0
$25,000 to $29,999	7	8.1
$30,000 to $34,999	13	15.1
$35,000 to $39,999	13	15.1
$40,000 to $49,999	14	16.3
$50,000 to $59,999	3	3.5
$60,000 to $69,999	7	8.1
$70,000 to $79,999	2	2.3
Above $80,000	14	16.3
TOTAL	86[a]	100.0

[a]N=92, six missing responses

Table 6. *Response to statement "I believe the Texas 4-H Council has contributed to my career success."*

Amount of Agreement	Frequency	Percentage
Strongly Agree	54	60.0
Agree	27	30.0
Uncertain	6	6.7
Disagree	2	2.2
Strongly Disagree	1	1.1
TOTAL	90[a]	100.0

[a]N=92, two missing responses

Most (63%) of the former Council members either agreed or strongly agreed that serving on the Texas 4-H Council influenced their career choice and a large majority (92.2%) either agreed or strongly agreed that they were satisfied with their career.

Respondents were asked in which civic organizations they participate. Table 7 illustrates that half (50%) of the respondents are active in professional organizations and 62% are active in church organizations. Slightly over one-fifth (20.7%) belong to the 4-H Volunteer Leaders Association, 14.1% belong to the PTA/PTO, 5.4% are active in the Lions Club, and 4.3% are members of the Junior League. Only 2.2% belong to both the Rotary Club and Women's Auxillary respectively, and 1.1% are Masons. None of the respondents participated in Kiwanis and 33.7% indicate they are active in organizations other than these.

Table 7. *Participation in civic organizations*

Organization	Percent Involved
Lions Club	5.4
Rotary Club	2.2
Women's Auxillary	2.2
Kiwanis	0.0
PTA/PTO	14.1
Masons	1.1
Junior League	4.3
Professional Organization	50.0
4-H Volunteer Leaders Association	20.7
Church Organizations	62.0
Other	33.7

Not many respondents tended to hold an elected position in a public office, but were much more likely to hold an elected position in agricultural organizations.

Over three-fourths (75.9%) of the respondents either agreed or strongly agreed that serving on Texas 4-H Council influenced their decision to join organizations. A large majority (81.4%) either agreed or strongly agreed that serving on Council had an effect on them being elected to leadership positions.

Table 8 represents former Council members' responses to the statement, "I believe the Texas 4-H Council has contributed to my level of community involvement." Over three-fourths of the respondents either agreed or strongly agreed with the statement. Over one half (51.1%) agreed and 26.7% strongly agreed. Under one-tenth (7.8%) disagreed and 4.4% strongly disagreed. Ten percent were uncertain.

Table 8. *Response to statement "I believe the Texas 4-H Council has contributed to my level of community involvement."*

Amount of Agreement	Frequency	Percentage
Strongly Agree	24	26.7
Agree	46	51.1
Uncertain	9	10.0
Disagree	7	7.8
Strongly Disagree	4	4.4
TOTAL	90[a]	100.0

[a]N=92, two missing responses

Tables 9-11 indicate the participants' responses to open-ended questions which were asked in order to allow them to explain how their educational attainment, career choices, and community involvement were affected by their experiences on the Texas 4-H Council.

Table 9. *Responses to the question "How did serving on the Texas 4-H Council affect your educational attainment?"*

Council's Effect	Frequency
Taught skills that helped me succeed (public speaking, leadership, goal setting, etc.)	22
Allowed opportunities to investigate colleges & gain contacts within the college	10
Improved self-esteem, confidence, and social skills	7
Influenced/reassured degree in agriculture	6
Exposure to contacts and experiences that encouraged higher education	6
Council friends going to college influenced choice; peer pressure	6
Provided scholarship opportunities	5
Encourage success and to be the best in everything	3
Council did not influence/Already knew I was going to college	8

Table 10. *Responses to the question "How did serving on the Texas 4-H Council affect your career choice?"*

Council's Effect	Frequency
Helped develop skills used in my career (public speaking, people skills, leadership, goal setting, organization, etc)	19
Prepared and encouraged me to work with and help others	15
Influenced a career in agriculture/family and consumer sciences	7
Influenced degree choice	6
Increased exposure to and awareness of opportunities	4
Networking opportunities/Contacts	4
Did not affect career choice/Career already determined	17

Table 11. *Responses to the question "How did serving on the Texas 4-H Council affect your community involvement?"*

Council's Effect	Frequency
Taught me the importance of community involvement (making a difference, youth involvement, leadership)	20
Taught skills that are helpful in community involvement (leadership, public speaking, people skills)	12
Encouraged me to "give back" and help others	8
Set my need to serve into action; once involved, always involved	7
Once I am settled or move to a smaller town or have children involved, I will be more involved	6
Not afraid to get involved and join organizations	6
Did not affect community involvement/Not involved	12

Conclusions

The following conclusions are based on interpretations of data presented in the study and are restricted to the population surveyed. They also are subject to the limitations outlined in Chapter I of the study. The conclusions are as follows:

1. Most of the former Texas 4-H Council members are Caucasian/White.

2. There was a low divorce rate among the Council members with only 3.3 percent having divorced compared to the national average of 9.8 percent (U.S. Census Bureau, 1998).

3. Most of the former Texas 4-H Council members attained a high level of education with all of them having attended some college.

4. The members of the Texas 4-H Council were more highly educated than the general public with 57.1 percent having earned a bachelor's degree and 28.6 percent having a master's degree. This is compared to the national average where 24.4 percent have a bachelor's degree or more (U.S. Census Bureau, 1998).

5. The majority of the Texas 4-H Council members felt that serving on Council benefited them in attaining a college education. Specifically, the members stated that it taught them skills such as public speaking, leadership, and goal setting that helped them throughout their college career.

6. Most Council members agreed that the Texas 4-H Council contributed to their career success by teaching them skills such as public speaking and people skills that they use daily in their careers.

7. Over 90 percent of the Texas 4-H Council members were satisfied with their current occupation.

8. There was a high range of salaries earned by the former Texas 4-H Council members. The largest percentages reported earning between $40,000 - $49,999 and above $80,000. This is compared to the national average of $40,478 for a person with a bachelor's degree.

9. Most Council members were actively involved in their community with the largest majority being involved in professional organizations and church.
10. The majority of the Council members believed that serving on the Texas 4-H Council positively influenced their community involvement by teaching them the importance of community involvement and teaching skills that are helpful when working with the community. Some of the skills they listed were leadership and public speaking.

11. An accurate mailing list for former Texas 4-H Council members was not available.

Recommendations

The following recommendations are made by the investigator as a result of having made this study:

1. It is recommended that the benefits of serving on Texas 4-H Council identified in this study be publicized to extension personnel so that they might use this information as a recruitment tool. It should be noted that all the respondents in this study felt that serving on Texas 4-H Council benefited them in the areas of educational attainment, career choice, and community involvement. The benefits listed most commonly were learning public speaking skills, leadership skills, goal setting, and people skills.

2. The Texas 4-H Council should look to increase the level of minority involvement and their minority recruitment efforts as evidenced by the fact that only 6.5 percent were non-Caucasian.

3. Most of the former Texas 4-H Council members were either from a farm or ranch or a rural area; therefore, the need exists to increase the awareness of 4-H and the Texas 4-H Council opportunities in urban areas.

4. The Texas 4-H Council should do more to instill the importance of community involvement throughout life, rather than just during the 4-H years.

5. Some of the same opportunities that are available to Texas 4-H Council members should be made available at the District and County levels. These opportunities would include: networking, visits to and contacts within universities, more public speaking opportunities, and exposure to new fields.

6. The State 4-H office and the 4-H Foundation should keep an updated database to help in maintaining alumni relations and to assist in future research.

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Students' Perceptions of Unethical Practices in FFA Competitions

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Abstract

The purpose of this study was to determine perceptions of agricultural education students concerning unethical practices in FFA competitive events and award programs. The following objectives were formulated to accomplish this purpose: Identify selected demographic characteristics of FFA members in the population; Identify unethical practices taking place in competitive events and award programs of the FFA; Determine FFA members' awareness of unethical practices taking place in competitive events and award programs of the FFA; Determine FFA members' perceptions of how common these unethical practices take place in competitive events and award programs of the FFA; and, Determine if there are any relationships between FFA member characteristics and the members' awareness of unethical practices. Data were collected from 399 students enrolled in secondary agricultural education courses. The data collection instrument was a researcher-designed survey composed of two parts. The first part was a list of unethical practices related to FFA competitive events. Respondents indicated their awareness of each practice and how widespread they perceived the practice to be. The second part of the instrument was designed to gather data about the students, including their involvement in FFA activities.

The results indicated that students who participated in the FFA competitions were aware of a variety of unethical practices that take place in those events. Among the most common were physical abuse of show animals, someone other than the speaker writing a prepared speech and judging team teammates sharing class results. While recognizing that perceptions, particularly perceptions of children, can be inaccurate, the researches conclude that the results of this study indicate the need for an ethics education among FFA members. Efforts should be made to help competitors understand the values associated with character and fair play.

Introduction

In his book, *All I Really Need to Know I Learned in Kindergarten: Uncommon Thoughts on Common Things,* Robert Fulghum (1989) listed some simple truths that he believed were important to live a meaningful life. Near the top of that list was "Play fair" (p. 6). But, how much do kids learn about fair play in school today?

The November 22, 1999, issue of *U.S. News and World Report* focused upon cheating in our nation's schools. In the Editors' Advisory (November 22, 1999), the editors of that publication asserted that the majority of American students cheat, whether they are in middle school or professional school. In a random poll of 1000 adults that included 200 college students, 72% of the respondents said high school students cheat often. Sixty-four percent of the respondents said that college students cheat, 31% said parents of children cheat, and 25% said teachers cheat.

In a *Newsweek* (May 8, 2000) story, a 17 year-old student said, "'lying and cheating are standard behavior'" (p. 2). That thought was supported in a survey conducted by Who's Who Among American High School Students (Kleiner & Lord, Nov 22, 1999). In that study, 80% of "high-achieving" high school students said they had cheated at least once and over half said that cheating was not necessarily wrong. Kleiner and Lord (Nov. 22, 1999) also quoted a college student saying, "'I know it's [cheating] wrong, but I don't feel bad about it either, partly because I know everyone else is doing it'" (p. 2).

Cheating in schools is not limited to academic work, though. Virtually every year a number of athletic programs at universities are investigated and penalized for violations of the rules for recruiting student-athletes. Most recently Brown University, an Ivy League institution, was found to have violated rules in the recruitment of athletes for four of its athletic teams (CNNSI, 2000).

The use of anabolic steroids by high school athletes is also a growing concern. According to the National Institute on Drug Abuse (May 18, 2000), the illegal use of anabolic steroids by high schools students has increased since 1991. The Institute says that high school students take the drug to gain a competitive edge over their opponents or even to improve their physical appearance.

So, have cheating and lying become a part of the "American way?" In a 1987 article in *U.S. News and World Report* (McLoughlin, Sheler & Witkin, February 23), John Gardner of Common Cause was quoted as saying, "'Duplicity and deception, in public and private life, are very substantially greater than they have been in the past'" (p. 54).

With all of this dishonesty and lack of fair play in our schools, thankfully, there are some bastions of hope. In many schools, groups of students have crafted honesty statements and honor codes. Since its inception, the National FFA Organization has promoted fair play.

The fourth paragraph of the FFA Creed (National FFA Organization, 1999) states that members believe in “playing square with those whose happiness depends upon me” (p. 10). The FFA Code of Ethics (National FFA Manual) states that FFA members pledge to “Be courteous, honest and fair with others” (National FFA Organization, 1999, p. 12).

Recent research shows that the FFA and the overall program of agricultural education in secondary schools holds great opportunity for teaching students about fair play and other values. In their investigation of the teaching of values in agricultural education, Lockaby and Vaughn (1999) concluded that teachers believe that values should be taught to students in agricultural education. While their respondents indicated that values could be taught through the classroom, laboratory and SAE program, they said that the FFA was the most ideal component of the program to teach students about values. The teachers said the most important values to be taught were honesty, courtesy, responsibility and cooperation.

However, all does not appear to be honest and fair in regard to educational programs for agricultural youth. Kieth (1997) found that parents of youth participating in livestock shows believe that dishonest and unethical practices are a problem in livestock showing. One of his respondents claimed to have seen people cheat to win and another indicated he believed some competitors would do anything to win. In a 1999 study Kieth and Vaughn found that parents identified unethical practices as one of the most common problems with 4H competitive evens.

Apparently, those concerns have merit. Murphy, Norwood and Dubes (1995) found that 25% of participants in the Houston Livestock Show and Rodeo admitted to knowingly using illegal drugs on their show animals. Further, more than 37% of the respondents said they had falsified information on registration certificates. Last spring, a freshman FFA member in Texas voiced concerns about one of her competitors. She claimed that an FFA member from a neighboring chapter told her he had never seen his show pig until the night before the show (Lynch, April 11, 2000).

Are these unethical behaviors limited to livestock shows or do they extend to other areas of competition and award programs in the FFA? How many students are aware of these practices taking place in FFA competitions? Perhaps the students who participate in these activities can shed some light on this subject.

Purpose and Objectives

The purpose of this study was to determine perceptions of agricultural education students concerning unethical practices in FFA competitive events and award programs. The following objectives were formulated to accomplish this purpose:

Identify selected demographic characteristics of FFA members in the population.

Identify unethical practices taking place in competitive events and award programs of the FFA.

Determine FFA members' awareness of unethical practices taking place in competitive events and award programs of the FFA.

Determine FFA members' perceptions of how common these unethical practices take place in competitive events and award programs of the FFA.

Determine if there are any relationships between FFA member characteristics and the members' awareness of unethical practices.

Methods

The population for this study was agricultural education students in a state with a large FFA membership. Because of the sensitivity of this study, the state will not be identified. Cluster sampling was used with schools being considered the natural forming group. Fourteen schools were randomly selected. The agriculture teachers at those schools were contacted and asked to participate in the study and indicate the number of agriculture students at that school. This procedure yielded a sample group of 399, which is in excess of the needed sample size for a population of more than 10,000 (Ott, 1986).

A questionnaire was used as the data collection instrument. The instrument consisted of two parts. Part I was designed to gather information about unethical activities related to livestock shows, public speaking contests, judging contests and other career development events, individual award programs and chapter award programs. Part II was designed to gather selected demographic data about the respondents and their involvement in the FFA.

To formulate the items in Part I, a panel of experts consisting of 50 pre-service teaching candidates enrolled in an upper level agricultural education course at a comprehensive university were used. The panel, with each being a former member of the FFA, was asked to identify unethical practices associated with FFA competitions. These data were synthesized and integrated into the instrument to collect data from the high school students.

The instrument was pilot tested at a school that was not a part of the sample group. Members of the pilot group completed the questionnaire, answered questions related to the clarity of the instrument and made other suggestions. No major changes were made to the instrument as a result of this process.

The instruments were administered on site by the researcher at all but one school. At that school, a packet of instruments was mailed to the school and administered by the local agriculture teacher. Data analysis revealed no significant difference between the two instrument administration modes.

Data were analyzed using SPSS for Windows. Descriptive statistics were calculated on every variable. Correlation coefficients were also calculated between all of the variables. T-tests and ANOVA procedures were used to compare means. Real limits were used to describe means and Davis' (1971) conventions were used to describe correlation associations.

Results

Characteristics of Respondents

More than two-thirds of the 399 respondents were male. As shown in Figure 1, while only 26 students were eighth graders, the remainder of the group was fairly evenly dispersed among grades nine through twelve.

The students were asked to provide information about their membership in agricultural youth organizations. As illustrated in Figure 1, nearly 95% of the agriculture students indicated they were FFA members. Of those, more than 60% were in their first or second year of membership. More than 35% of the respondents were or had been a member of 4-H. These findings are representative of the population.

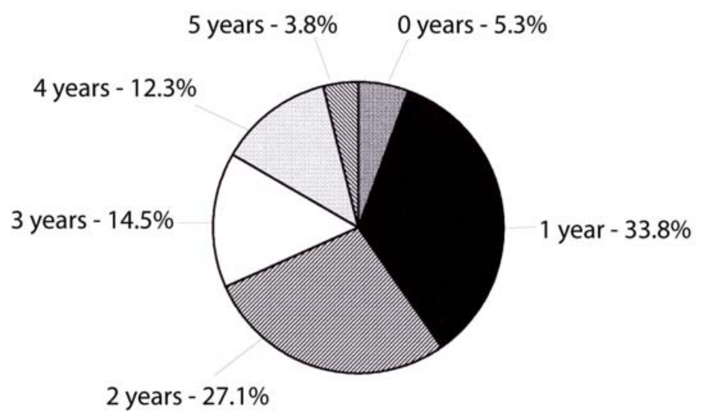

Figure 1. *Years respondents have been a member of the FFA.*

Information was solicited about the students' involvement in selected FFA activities. Figure 2 shows a list of the activities included in this study along with the frequency and percent of respondents participating in each. The FFA activities in which the most students were involved were livestock shows (38.8%) and career development events (CDE's) (36.3%). Almost one-fourth of the students had attended the state FFA convention and more than 14% had attended the national FFA convention. Fifteen percent of the students were chapter officers and 15% competed in public speaking contests. Only 9% of the respondents indicated they had applied for a proficiency award above the local level. Eighteen (4.5%) students said they were involved in all eight of the activity areas. On the other hand, 177 (44.4%) were involved in none of the activities investigated.

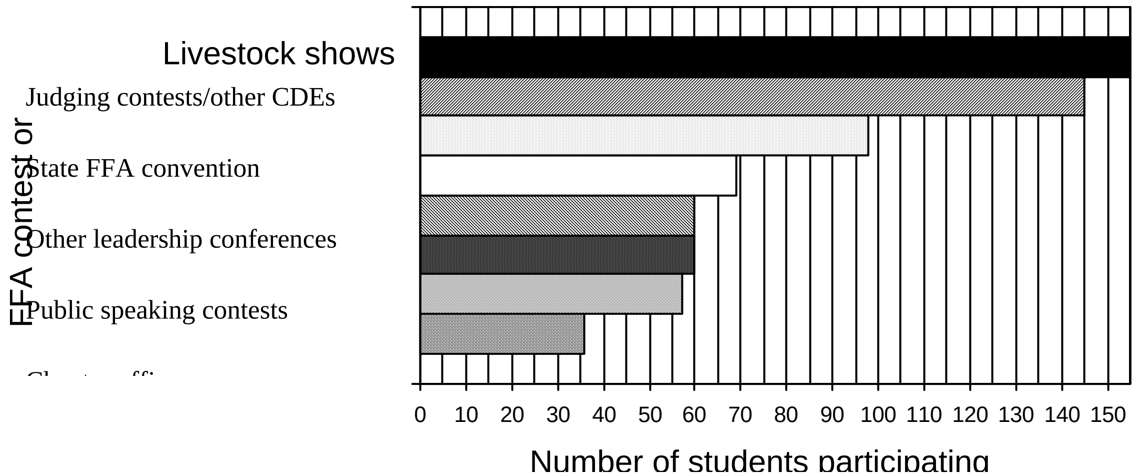

Figure 2. *Number of students involved in selected FFA activities.*

Identification of unethical practices

The panel of university students studying agricultural education identified twenty-three unethical practices associated with FFA contests and award programs. Eight practices were related to livestock shows, two were related to public speaking contests and five were related to judging contests and other CDE's. The group also identified six unethical practices related to individual award applications such as the state FFA degree and proficiency awards and two practices related to chapter award programs. A list of these practices is shown in Tables 1 – 5.

FFA members' awareness of unethical practices

Data related to this objective were analyzed and reported in three ways. First, all respondents were grouped together to show the perceptions of the high school agriculture students as a whole. Second, only those students who indicated that they participated in that activity were grouped together. Third, the students who indicated that they had participated in two or more of the leadership related activities were grouped together and labeled "Chapter Leaders". Those activities were: state FFA convention, national FFA convention, other FFA leadership conferences (MFE, COLT conference, state leadership camp, etc.), and chapter office.

Table 1 displays the data associated with unethical practices related to livestock shows. A higher percentage of students who participated in livestock shows and of the chapter leaders were aware of each of the unethical practices investigated compared to the overall group of respondents. More than two-thirds of the chapter leaders and more than 62% of the participants were aware of physical abuse of animals taking place. More than half of the participants and nearly 60% of the chapter leaders were aware of the use of illegal drugs on show animals. A high percentage of students were also aware of unethical practices regarding ownership and registration of animals as well as grooming and other alterations of the appearance of animals.

Table 1. *Agreement with statements concerning livestock shows*

Unethical practice	All respondents %	Participants in livestock shows %	Chapter leaders %
Physically abusing animals	49.1	62.3	66.7
Illegal use of drugs to enhance growth or performance of show animals	39.1	52.3	58.3
Showing an animal with out owning it for the required amount of time	31.3	45.8	50.0
Illegally altering the physical appearance of an animal (injecting air, filing teeth, dying hair, etc.)	31.1	51.0	56.9
Giving false information about the date of birth (fixing papers) of a breeding animal	31.0	45.1	52.9
Animals cared for by a professional feeder rather than by the show person	28.7	39.4	48.6
Changing ear tags or altering tattoos of show animals	22.7	34.6	43.7
Use of professional groomers at shows where that practice is not allowed	17.1	31.0	38.9

For FFA speeches in this state, the competitor and his/her advisor must sign a form certifying that the manuscript is the original work of the competitor. More than 70% of the students who participated in FFA speech contests were aware of competitors giving speeches that were not the original work of the speaker. While more than 40% of all respondents were aware of this practice, more than 60% of chapter leaders knew of it. A summary of the data related to public speaking contests is shown in Table 2.

Table 2. *Agreement with statements concerning speech contests*

Unethical practice	All respondents %	Participants in speech contests %	Chapter leaders %
Someone other than the speaker writing the speech	40.8	71.7	61.1
Not citing references used	18.2	43.3	33.3

As can be seen in Table 3, more than one-third of the students surveyed said they participated in judging contests and other CDEs. Nearly half of all students and more than two-thirds of the participants and the chapter leaders were aware of competitors in CDEs “sharing” answers with teammates. More than 55% of participants and chapter leaders were also aware of contestants looking at the work of other contestants (not on the same team) during a contest. More than one-third of the competitors and chapter leaders were aware of the practice of team coaches illegally talking to or signaling contestants and more than half of the chapter leaders knew of the practice of contestants using pre-written reasons in a contest.

Table 3. *Agreement with statements concerning judging contests and other CDEs*

Unethical practice	All respondents %	Participants in judging contests & CDE’s %	Chapter leaders %
Teammates sharing answers (talking, passing notes, signaling, etc.)	48.9	68.3	68.1
Looking at the work of other contestants in a group	39.8	55.2	56.9
Coaches talking to or signaling contestants	27.6	33.1	38.9
Using pre-written reasons	25.8	42.4	53.5
Using illegal charts, notes, measuring devices or other materials during a contest	13.6	21.5	28.2

Table 4. *Agreement with statements concerning individual award programs*

Unethical practice	All respondents %	Participants in individual award programs %	Chapter leaders %
Over-valuing animals, land, equipment or other assets (claiming something is worth more than it is truly worth)	33.9	51.4	49.3
Not claiming debts that exist (not showing losses that occurred with projects)	24.6	40.0	39.4
Falsely claiming participation in activities	24.6	41.2	37.1
Falsely claiming ownership of animals, land, equipment or other materials (assets really owned by someone other than the student)	23.4	40.0	37.5
Falsely claiming awards or other recognition earned	17.7	34.3	23.9
Falsifying receipts, registration papers and other documents	16.8	37.1	26.8

Unethical activities associated with award programs were also studied. Approximately half of the chapter leaders and award program participants were aware of assets being over-valued on award applications. Some 40% of the award program participants and chapter leaders were also aware of existing debts not being claimed by award applicants. As can been seen in Table 4, the students had similar opinions concerning other discrepancies related to falsifying records on award applications

About one-third of the chapter leaders and about one-fourth of all respondents were aware that chapter award applications included activities that did not take place and exaggeration about participation of activities took place (see Table 5). A category of "participants" was not included for these items since they related to chapter awards. Presumably, every chapter member would be a participant.

Table 5. *Agreement with statements concerning chapter award programs*

Unethical practice	All respondents %	Chapter leaders %
Reporting activities that didn't happen	23.1	31.9
Saying more people participated in activities than really did	26.6	34.7

Commonality of unethical practices

Data about the students' perceptions of how commonly the unethical practices took place were also collected. Only data from participants in the competitive activities and chapter leaders are presented. As can be seen in Table 6, the mean for each of the practices was in the real limits of the "fairly common" response choice.

Table 6. *Commonality of unethical practices*

Unethical practice	Participants in activity mean*	Chapter leaders mean*
CDE teammates sharing answers during a contest	2.23	2.23
Someone other than the speaker writing a speech for a speech contest	2.21	1.92
Using pre-written reasons in CDEs	2.15	2.14
Looking at the work of other contestants in a group during a CDE	2.14	2.07
Falsely claiming awards or other recognition earned on award applications	2.08	1.83
Falsely claiming ownership of animals, land, equipment or other materials on award applications	2.07	1.94
Livestock show animals cared for by a professional feeder rather than by the show person	1.95	1.94
Falsely claiming participation in activities on award applications	1.93	1.97
Not citing references used in manuscripts for speech contests	1.88	1.72
Showing an animal without owning it for the required amount of time	1.85	1.83
Use of professional groomers at livestock shows where that practice is not allowed	1.85	1.83
Falsifying receipts, registration papers and other documents on award applications	1.85	1.65
Over-valuing animals, land, equipment or other assets on award applications	1.83	1.89
Physically abusing livestock show animals	1.78	1.80
Coaches talking to or signaling contestants during CDEs	1.77	1.84
Illegal use of drugs to enhance growth or performance of show animals	1.75	1.70
Using illegal charts, notes, measuring devices or other materials during a CDE	1.74	1.80
Not claiming debts that exist on an award application	1.71	1.87
Illegally altering the physical appearance of a livestock show animal	1.70	1.69
Changing ear tags or altering tattoos of show animals	1.60	1.62
Giving false information about the date of birth of a breeding animal on an award application	1.55	1.58
Reporting activities that didn't happen on a chapter award application	--	1.79
Saying more people participated in activities than really did on a chapter award application	--	1.76

* Scale: 1 – 1.50 = rarely happens; 1.51 – 2.50 = fairly common; 2.51 – 3.0 very common.

The unethical practice with the highest mean was for judging contest or CDE team teammates sharing answers (2.23). Forty percent of the participants in this competition area who were aware of this practice said it was a very common occurrence. Three of the five highest means were for unethical practices related to judging contests and CDEs.

The second highest mean was for the practice of someone other than the speaker writing the manuscript of a speech (2.21). Upon closer analysis, 42% of the speech contest participants who were aware of this practice said it was a "very common" occurrence.

Relationships between and among variables

Correlation coefficients were calculated between the selected student characteristics and the other variables. There were no relationships above the negligible level between any of the variables and gender or grade in school.

Twenty of the 23 unethical practices included in this study had positive, low relationships with the years of FFA membership. In other words, as the students' years in FFA increased so did their awareness of these unethical practices. Another variable with which several other variable were significantly associated was 4-H membership. All but six (17) of the unethical practices had a positive, low association with 4-H membership.

Every unethical practice investigated had a statistically significant relationship with number of activities in which the FFA member participated. While most of these relationships were at the low association level, five were moderately associated with this variable. These data are summarized in Table 7.

Table 7. *Statistically significant correlations between student characteristics and awareness of unethical practices*

Variable	Years in FFA <u>r</u>	Ever a member of 4H <u>r</u>	Number of activities <u>r</u>
Illegal use of drugs to enhance growth or performance of show animals	.168	.211	.215
Giving false information about the date of birth (fixing papers) of a breeding animal	.141	.206	.254
Illegally altering the physical appearance of an animal (injecting air, filing teeth, dying hair, etc.)	.203	.281	.365*
Physically abusing animals	.166	.221	.158
Changing ear tags or altering tattoos of show animals	.163	.141	.232
Showing an animal with out owning it for the required amount of time	.259	.287	.272
Use of professional groomers at shows where that practice is not allowed	.224	.214	.326*
Animals cared for by a professional feeder rather than	.175	.175	.247

by the show person			
Someone other than the speaker writing the speech	.123	.102	.307*
Not citing references used	.231	--	.211
Teammates sharing answers (talking, passing notes, signaling, etc.)	.108	.158	.287
Coaches talking to or signaling contestants	--	--	.133
Using pre-written reasons	.207	.173	.385*
Looking at the work of other contestants in a group	.116	.167	.300*
Using illegal charts, notes, measuring devices or other materials during a contest	.112	--	.231
Falsely claiming ownership of animals, land, equipment or other materials (assets really owned by someone other than the student)	.118	.141	.236
Over-valuing animals, land, equipment or other assets (claiming something is worth more than it is truly worth)	.171	.167	.221
Not claiming debts that exist (not showing losses that occurred with projects)	.114	.140	.222
Falsely claiming participation in activities	.163	--	.218
Falsely claiming awards or other recognition earned	--	--	.194
Falsifying receipts, registration papers and other documents	.110	.190	.238
Reporting activities that didn't happen	--	--	.147
Saying more people participated in activities than really did	.126	.142	.125

* Indicates correlations of moderate association. All others are of low association.

Conclusions and Implications

The following conclusions were formulated based on the results of this study.

1. Nearly all high school agriculture students in this state are members of the FFA. While at first glance this is "good news" it also raises some questions. Is not the expectation that all agriculture students be FFA members? If the student organization is truly "intracurricular," then all agriculture students should be FFA members.

2. Just more than half of the FFA members in this state are involved in FFA contests and award programs such as livestock shows, career development events and proficiency awards beyond the local level. Fewer than 20% of the students participate in more

than 2 areas of competitive events. If the students are not participating in these competitive events, then exactly what are they doing as FFA members?

3. The most popular types of FFA competitions for members in this state are livestock shows and judging contests. A substantial number of students also take part in activities such as state and national conventions and other leadership conferences.

4. High school agriculture students are aware of a wide variety of unethical practices taking place in FFA contests and award programs. As would be expected, students who participate in the contests are much more aware of the practices than those who do not. From what experiences have these perceptions been formed? Are the perceptions formed from lore? Are they simply excuses made by competitors who don't win? Have students witnessed the unethical practices first hand? Have they, personally practiced the behaviors?

5. Overall, students perceive the unethical practices included in this study to be "fairly common" occurrences. In fact, for a few practices participants consider the practice to occur very commonly. So, what are students learning from participating in these activities? What educational value do these activities have when students believe these unethical practices go on? Could these competitive events in fact be miseducational? Are students learning to cheat or tolerate cheaters?

6. Neither gender nor classification in school has any real impact on students' perceptions about unethical practices in competitive activities sponsored by the FFA. However, the longer students are in agricultural youth organizations (FFA and/or 4-H) and the more they participate in their activities, the more aware they are of the unethical practices associated with competitive activities sponsored by those groups.

7. The researchers understand that the findings here are based upon perceptions. The actions of a few could cause FFA members to believe problems are more widespread than they truly are. However, if even a few FFA members are engaged in the unethical practices described here, then there is a problem. If some members choose not to participate in FFA competitive events because of these perceptions, then there is a problem. If some students do not enroll in agricultural education classes because of these perceptions, then there is a problem.

Recommendations

1. Merit must be given to the perceptions of students who are involved in FFA competitive activities that unethical practices are fairly common. Apparently, these students perceive people are getting away with cheating. While more investigation is needed to determine how these perceptions were formed, the fact that students feel cheating is associated with these activities cannot be ignored.

2. Rules that are in place to guide fair play in FFA competitive activities must be enforced. In most cases, there is not a need for more rules, just a commitment to work to identify and punish violators. People who sponsor and supervise these activities need to be diligent in their expectations that rules be followed. There must be serious penalties in place in cases where violations are found and guilty parties are identified though due process.

3. Goodwin, Briers and Murphy (1999) contended that a change in ethical cognition would lead to a change in ethical behavior. If they are correct, then ethics and character education programs need to be taught to students involved in competitive activities. It is important for them to learn to appreciate the value of fair play and the hollowness of winning through cheating.

4. Further research needs to be conducted to learn why some competitors cheat in FFA contests and award programs and who or what influences them to use these unethical approaches to competition.

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Analyzing the Barriers and Benefits Toward Instructional Technology Instruction in North Carolina and Virginia Secondary Agricultural Education Curricula

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Introduction/ Rationale

According to Reinventing Agricultural Education for the Year 2020 (a visioning and planning initiative of the National FFA Organization, 1999), the United States leading position in agriculture "lies in part because of its infrastructure for developing and delivery technology, including agricultural education programs in our public schools" (National FFA Organization, 1999). The National Research Council (1988), in the book Understanding Agriculture, emphasized that in order for agricultural education to remain viable, educators should emulate the best current programs while generating new ways to deliver agricultural education. "Rather than reacting to change as it comes "a passive approach" the agricultural education community must take a proactive stance and look ahead to develop a cohesive vision of its preferred future decade" (National FFA Organization, 1999). Educational delivery systems and current curriculum initiatives have not kept pace with the rate of technological change that the United States has experienced over the past decade (National FFA Organization, 1999).

Instructional technology infusion into the secondary level of public education has become a major focus of both the North Carolina Department of Public Instruction and the Virginia Department of Education. The Six-Year Educational Technology Plan for Virginia (1996-2000) emerged out of the awareness that technology is not simply equipment, but a systematic treatment of information and instructional content in a specialized way to achieve a specific purpose. "Teachers must be trained, support services must be provided, pilot studies must be initiated, equipment must be updated and maintained, guidelines must be developed, new technologies must be introduced, and an on-going program of evaluation must be established" (Virginia Department of Public Education: Division of Technology, 1996). North Carolina educators have also recognized the importance of instructional technology infusion in public schools. In 1995 educators in North Carolina, initiated a five-year plan, entitled the Long-Range Technology Plan, in order to address the need for instructional technology infusion in public education throughout the state (Milken Exchange, 1999). In the Long Range State Technology Plan (1999) it states that the classroom is the "focal point" for teaching and learning, therefore the standard for creating technology-supported schools should be centered on it. Two important factors will characterize a technology-supported classroom in North Carolina: 1. Equipped with diverse options for teaching and learning that only technology can offer or make possible. 2. Managed by a knowledgeable, skilled, and motivated teacher who is both comfortable and creative with technology (North Carolina Department of Public Instruction, 1999). In order to effectively implement any form of technology in the secondary agricultural education programs of North Carolina and Virginia, it is imperative to first gauge the perceptions of educators towards technology infusion.

Theoretical Framework

"With the increase in computer usage in agriculture education programs, it is important to identify what the agriculture instructors think about using the computer" (Nordheim & Connors, 1997, p. 320). Before implementing any form of instructional technology into secondary agricultural education, careful consideration should be given to the perceptions of the teachers who will utilize the technology. Nordheim and Connors (1997) investigated the perceptions of northwest agriculture teachers in relation to computers in the classroom. Over 85% of agriculture teachers surveyed felt they were competent in using computers, while 81% stated that computers made them more efficient instructors in the classroom. Sixty-nine percent of respondents indicated they were comfortable using computers in the classroom. Over 85% of agriculture teachers surveyed indicated computers made their students more efficient, while 82%percent of agriculture teachers agreed that computers are essential to their agricultural science class. Eighty-five percent of respondents agreed that students should learn to use the Internet; while 75% of teachers agreed that the Internet should be used in agriculture classes. Eighty percent of teachers stated that multimedia presentations spark students' interests, while 77% of respondents stated that multimedia presentations are an effective teaching method (Nordheim & Connors, 1997).

Murphy and Terry (1998) conducted a nationwide study using Delphi techniques to develop consensus and provide focus for future research concerning the adoption of electronic communication, information, and imaging technologies for instructional use in agricultural education settings. One of the major objectives of the study was to gauge agricultural educators opinions in relation to the positive effects they feel electronic technologies will have upon agricultural education instruction. Respondents suggested 21 ways technologies would improve instruction in agricultural education. Responses tended to gather around the following four areas: (1) an increase in the availability of educational opportunities, (2) improved informational resources for faculty and students, (3) more effective instructional materials, and (4) more convenient delivery methods for instructors (Murphy & Terry, 1998).

While instructional technology offers many great possibilities for the future of agricultural education, many obstacles could inhibit its implementation. Nordheim and Connors (1997) identified several barriers to using computers in secondary agricultural education. The majority of respondents indicated that computer hardware and software were too expensive for their agricultural education programs. Respondents also indicated that having little experience with using computers, as an instructional tool was a limiting factor. Murphy and Terry (1998) identified several obstacles to technology implementation in agricultural education. Lack of administrative support, lack of support services for equipment maintenance, resistance to change by educators, lack of a reward system for technology implementation, lack of preparation time, and lack of access to state-of-the-art equipment were identified as barriers to instructional technology implementation (Murphy & Terry, 1998).

Purposes and Objectives

The purpose of this research study was to identify the potential barriers and benefits toward instructional technology infusion in North Carolina and Virginia secondary agricultural education curricula:

1. To determine the future role that instructional technology will play in secondary agricultural education curricula.

2. To determine the potential barriers and benefits towards the implementation of instructional technology in secondary agricultural education curricula.

3. To determine the demographic and program variables of North Carolina and Virginia secondary agricultural education programs.

Methodology

An instrument was developed by the researcher based on the objectives of the study. Questions were adapted and modified from previous studies by Nordheim and Connors (1997), and Murphy and Terry (1998). Additional questions were added by the researcher to meet the research objectives. The completed instrument consisted of three sections, with section one consisting of two subsections. The sections were titled: Section I. (A) benefits of instructional technology, (B) obstacles to instructional technology, Section II; instructional technology's future role in agricultural education Section III; demographic and program variables. Sections one and two contained Likert-type items, while section three contained a mixture of open-ended questions and Likert-type items. The validity of the instrument was established by means of content and face validity. A panel of experts constituting the researchers graduate committee analyzed the instrument for content validity. Face validity was established during a pilot study consisting of 40 Iowa secondary agriculture teachers. On April 15, 1999 40 Iowa secondary agriculture teachers were mailed a preliminary survey and given two weeks to complete and return the survey. After two weeks sixteen surveys had been returned. After all pilot surveys had been collected; instrument reliability was determined by utilizing Chronbach's Coefficient Alpha. Chronbach's Coefficient Alpha for sections one and two was .89, and .84 respectively. After the reliability level was determined, a few questions were deleted and adjusted.

The population for this descriptive survey study consisted of secondary agriculture teachers in North Carolina and Virginia that were listed in the 1998-99 North Carolina Agricultural Education Directory (N = 370) and Virginia Vocational Agriculture Teacher's Association Directory (N = 313). Based on Krejcie and Morgan's (1970) formula for a 5%

margin of error, a random sample of 242 would be required for a population of this size. As is the nature of survey research a certain loss rate can be expected. In an attempt to achieve the target sample size of 242, the researcher investigated the return rate of similar studies in agricultural education in the area of instructional technology. Thompson and Connors (1998) obtained a 70% return rate and Nordheim and Connors (1997) received a 72% return rate. After a thorough analysis of these studies the researcher concluded that 65% could be expected to be returned. In order to account for the potential loss rate, 380 agricultural teachers were sampled. The sample size was calculated by taking the desired return rate of 65% and the target sample size of 242 into account. Two hundred forty-two comprises 65% of 380; by utilizing this logic the researcher was more confident in obtaining the target return of 242 agricultural education teachers across both states. The Statistical Package for the Social Sciences, Personal Computer Version 7.0, and Microsoft Excel were used to generate random numbers for the sample selection. The stratified random sample was drawn from the population of agricultural education teachers in North Carolina (N = 370) and Virginia (N = 313). After the random numbers were generated 210 agricultural education teachers from North Carolina and 170 from Virginia were selected for the study. Elements of Dillman's Total Design Method (1978) were utilized to achieve an optimal return rate. On May 21, 1999 380 surveys were mailed to randomly selected teachers across the states of North Carolina and Virginia. Along with the survey, and return stamped envelope, teachers received a cover letter from the researcher and researcher's major professor outlining the purpose of the research. In addition to these materials, teachers from North Carolina also received a letter from the North Carolina - State Agricultural Education Director, in support of this research. Teachers in Virginia received a similar letter from the chairperson of the agricultural education department at Virginia Polytechnic and State University. After two weeks 122 surveys had been received. A follow-up letter was mailed to non-respondents, after two more weeks, 43 more surveys had been received. On June 17, 1999, 225 surveys were mailed to all non-respondents along with another cover letter and a return stamped envelope. Non-respondents were given a deadline of July 31, 1999, to return the survey.

By July 1, 1999, 40 more surveys had been received for a final return rate of 53% (200 surveys). Readers should note that even though only 200 surveys were returned of the 380 mailed, 200 comprised 83 % of the target goal of 242. This was considered highly acceptable by the researcher. Of the 200 surveys that were returned, 195 were useable (NC = 85, VA = 110). Five surveys were lost due to frame error, and five surveys were returned unusable, mainly due to being incompletely filled out. Non-response error was handled by utilizing the "double-dip procedure" (Miller and Smith, 1983). Ten percent of the non-respondents were telephoned and asked selected questions from the survey. After this was accomplished, t-tests were conducted to compare the answers of respondents versus non-respondents. No statistically significant differences could be found between the two groups.

Findings

Respondents were asked their perceptions in relation to fifteen statements regarding the potential benefits instructional technology implementation could have for secondary agricultural education curricula. Table 1 shows the means, standard deviations, and rankings for the perceived benefits of instructional technology as they relate to secondary agricultural education curricula in North Carolina and Virginia. For purpose of data analysis readers should utilize the following specifications when interpreting the scale for Tables 1 and 2: 1 - 1.49 = Strongly Agree, 1.50 - 2.49 = Disagree, 2.50 - 3.49 = Undecided/Neutral, 3.50 - 4.49 = Agree, 4.50 - 5.00 = Strongly Agree. Agricultural educators in North Carolina and Virginia were in agreement on the following six statements related to the potential benefits of instructional technology: "Teachers will have greater availability to information resources", "Student's access to instruction will be greatly enhanced", "Feedback to students will be quicker and more comprehensive", "The availability of up-to-date information will greatly increase student learning", "Agricultural businesses and other specialist will be made more available to students.", and "A greater array of visual instructional materials will be utilized." North Carolina agricultural education teachers reached agreement on the following eight statements regarding the potential benefits of instructional technology, while Virginia agriculture teachers took a neutral stance in relation to the eight statements: "Textbooks will be available on CD-ROM.", "Virtual reality and other simulations will increase student comprehension." Overall when comparing the total means for North Carolina and Virginia secondary agricultural education teachers in relation to the perceived benefits of instructional technology implementation, with the research literature, many similarities exist. Respondents were in agreement on thirteen of the fifteen statements regarding instructional technology benefits as they relate to secondary agricultural education curricula. Respondents were undecided on two of the fifteen statements regarding the benefits of instructional technology in secondary agricultural education curricula. Ten of the thirteen statements agriculture teachers agreed upon in relation to the benefits of instructional technology in secondary agricultural education curricula were adapted from the Delphi study conducted by Murphy and Terry (1998). As was the case in this study, the following ten statements reached a high level of agreement in Murphy and Terry's (1998) study, and provide support for this research: "Teachers will have greater access to information resources," "Textbooks will be available on CD ROM," "Teachers will have greater availability to information resources," "Student's access to instruction will be greatly enhanced," "Feedback to students will be quicker and more comprehensive," "Virtual reality and other simulations will increase student comprehension," "Instruction will become more individualized," "The interest of students will be increased," "Agricultural businesses and other specialist will be made more available to students," and "A greater array of visual instructional materials will be utilized." "Instruction will become more individualized," "The interest of students will be increased," "Videoconferencing with other students at other secondary schools will aide the learning process," "Videoconferencing with agricultural businesses will increase the level of instruction," "Videoconferencing will increase student comprehension," and "Videoconferencing will increase student comprehension." Lastly one statement reached a level of agreement by Virginia secondary agricultural education teachers, in contrast to North Carolina teachers who took a neutral stance on the statement: "Teachers will have greater availability to information resources."

The following three statements were developed by the researcher and achieved a level of agreement in this study: "The availability of up-to-date information will greatly increase student learning," "Videoconferencing with other students at other secondary schools will the level of instruction," and "Videoconferencing with agricultural businesses will increase the level of instruction." The following two statements developed by the researcher were ranked as "undecided" by agriculture teachers in this sample: "Videoconferencing will increase student comprehension," and " Videoconferencing will increase student comprehension." As was the case in Murphy and Terry's (1998) study, responses tended to gather around the following four areas: (1) an increase in the availability of educational opportunities, (2) improved informational resources for faculty and students, (3) more effective instructional materials, and (4) more convenient delivery methods for instructors.

Respondents were asked their perceptions in relation to fourteen statements regarding the potential barriers to instructional technology implementation in secondary agricultural education curricula. Table 2 shows the means, standard deviations, and rankings for the perceived barriers of instructional technology as they relate to secondary agricultural education curricula in North Carolina and Virginia. Statements for this section of the survey were adapted from studies conducted by Murphy and Terry (1998) and Nordheim and Connors (1997). North Carolina and

Table 1. *North Carolina and Virginia Secondary Agricultural Education Teachers' Perceptions of Instructional Technology's Benefits (n = 195)*

North Carolina				Virginia			Total		
Benefits	**Mean**	**SD**	**Rank**	**Mean**	**SD**	**Rank**	**Mean**	**SD**	**Rank**
Teachers will have greater access to Information resources.	3.41	1.55	13	3.85	1.22	2	3.66	1.39	6
Textbooks will be available on CD ROM.	3.67	1.07	9	3.48	1.10	9	3.56	1.09	9
Teachers will have greater availability to information resources.	4.42	.66	1	4.01	1.01	1	4.19	.90	1
Student's access to instruction will be greatly enhanced.	4.01	.97	3	3.67	1.08	4	3.82	1.05	3
Feedback to students will be quicker and more comprehensive.	3.74	1.00	7	3.52	1.08	7	3.62	1.05	8
Virtual reality and other simulations will Increase student comprehension.	3.71	.97	8	3.45	1.11	11	3.56	1.06	9
Instruction will become more individualized.	3.60	1.05	11	3.46	1.11	10	3.52	1.09	11
The interest of students will be increased.	3.88	.97	6	3.45	1.09	11	3.64	1.06	7
The availability of up-to-date information will greatly increase student learning.	3.93	1.01	5	3.64	1.11	6	3.76	1.08	5
Videoconferencing with other students at other secondary schools will aide the learning process.	3.67	1.03	9	3.44	1.19	12	3.54	1.13	10
Videoconferencing with ag-businesses will Increase the level of instruction.	3.54	.98	12	3.49	1.03	8	3.51	1.01	12
Videoconferencing will increase Student comprehension.	3.54	.99	12	3.34	1.10	13	3.43	1.06	13
Videoconferencing will increase student interest.	3.64	1.06	10	3.25	1.07	14	3.42	1.08	14
Agricultural businesses and other specialist will be made more available to students.	3.94	.84	4	3.65	1.06	5	3.77	.98	4
A greater array of visual instructional Materials will be utilized.	4.04	.81	2	3.71	.97	3	3.85	.92	2

Note: Based on scale: 1 = Strongly Disagree, 2 = Disagree, 3 = Undecided/ Neutral, 4 = Agree, 5 = Strongly Agree

Virginia secondary agricultural education teachers were neutral on the following seven statements regarding the perceived barriers to instructional technology implementation in secondary agricultural education curricula: "The cost of the various forms of instructional technology outweigh the benefits," "The lack of administrative support for instructional technology acquisition is a limiting factor," "Resistance to change by educators," "The lack of support from peers in securing such technologies," "Lack of awareness by administrators and legislators," "Lack of student knowledge to utilize technology," and "Lack of student interest." North Carolina and Virginia secondary agricultural education teachers were in agreement on the following four statements related to the perceived barriers to instructional technology implementation: "The lack of time by educators to master the immerging technologies for the classroom," "The lack of facilities designed to take advantage of new technologies," "Money for equipment," and "Money for software." The following statement reached agreement by North Carolina agriculture teachers in contrast to Virginia agriculture teachers who were neutral on the statement: "The lack of technical support to maintain equipment." The following two statements reached a level of agreement among Virginia agricultural education teachers, in contrast to North Carolina agriculture teachers who took a neutral stance on the statements: "Lack of telephone or data connection in classroom" and "Lack of teacher training in instructional technology." When comparing the total means for the perceived barriers of instructional technology implementation as they relate to secondary agricultural education curricula, with the research literature, many similarities and differences exist. In contrast to the aforementioned studies in which the statements were adapted, respondents ranked the majority of statements in this study as "undecided/neutral." The following statements were ranked as "undecided" by respondents in this study: "The cost of the various forms of instructional technology outweigh the benefits," "The lack of administrative support for instructional technology acquisition is a limiting factor," "Resistance to change by educators," "A lack of support from peers in securing such technologies," "Lack of awareness by administrators and legislators," "Lack of student knowledge to utilize technology," "Lack of student interest," and "Lack of telephone or data connection in classroom."

The following statements reached a level of agreement by agriculture education teachers in this sample and are consistent with Murphy and Terry (1998) and Nordheim and Connors's (1997) studies: "The lack of technical support to maintain equipment," "The lack of time by educators to master the immerging technologies for the classroom," The lack of facilities designed to take advantage of new technologies," "Money for equipment," "Money for software," and "Lack of teacher training in instructional technology." In relation to the final analysis, respondents overall ranked eight statements as "undecided/neutral" and six statements achieved a level of agreement.

Table 2. *North Carolina and Virginia Secondary Agricultural Education Teachers' Perceptions of Instructional Technology's Barriers (n = 195)*

North Carolina				**Virginia**			**Total**		
Barriers	**Mean**	**SD**	**Rank**	**Mean**	**SD**	**Rank**	**Mean**	**SD**	**Rank**
The cost of the various forms of instructional Technology outweigh the benefits.	2.98	1.21	11	3.19	1.22	9	3.10	1.22	10
The lack of administrative support for Instructional technology acquisition is a limiting factor.	3.32	1.80	8	3.11	1.36	10	3.20	1.57	9
Resistance to change by educators.	3.35	1.12	7	3.43	1.15	7	3.33	1.13	8
A lack of support from peers in securing Such technologies.	3.01	1.11	10	3.04	1.18	11	3.03	1.15	11
A lack of technical support to maintain equipment.	3.74	1.06	3	3.43	1.27	7	3.56	1.19	5
The lack of time by educators to master the Immerging technologies for the classroom.	3.71	1.14	4	3.63	1.14	4	3.66	1.14	4
Lack of awareness by administrators and legislators.	3.32	1.16	8	3.23	1.21	8	3.27	1.18	9
The lack of facilities designed to take Advantage of new technologies.	3.68	1.13	5	3.69	1.14	3	3.69	1.13	3
Lack of student knowledge to utilize technology.	2.78	1.16	12	2.99	1.16	12	2.90	1.16	12
Lack of student interest.	2.71	1.16	13	2.92	1.19	13	2.83	1.18	13
Cost of instructional technology:									
Money for equipment	3.98	1.00	2	3.88	1.08	2	3.92	1.04	2
Money for software	4.06	.98	1	4.00	.94	1	4.03	.95	1
Lack of telephone or data connection in classroom.	3.28	1.31	9	3.59	1.23	6	3.46	1.27	7
Lack of teacher training in instructional technology.	3.45	1.23	6	3.60	1.02	5	3.53	1.11	6

Note: Based on scale: 1 = Strongly Disagree, 2 = Disagree, 3 = Undecided/ Neutral, 4 = Agree, 5 = Strongly Agree

Respondents were asked their perceptions on ten statements in relation to the role they see instructional technology playing in secondary agricultural education curricula over the next five years. Table 3 shows the means, standard deviations, and rankings for the ten statements. For purpose of data analysis readers should utilize the following specifications when interpreting the scale for table 8: 1 - 1.49 = Strongly Agree, 1.50 - 2.49 = Disagree, 2.50 - 3.49 = Undecided/Neutral, 3.50 - 4.49 = Agree, 4.50 - 5.00 = Strongly Agree. North Carolina and Virginia agriculture teachers reached agreement on one of the ten statements related to the future of instructional technology in secondary agricultural education curricula: "Agriculture teachers will have access to lesson plans via the Internet." Agriculture teachers were generally undecided on nine of the ten statements in relation to the future of instructional technology in secondary agricultural education curricula: "Videoconferencing will be used to integrate resource persons into the classroom," " CD-ROM will take the place of many textbooks in teaching the agricultural sciences," "Virtual simulations will reduce the need for live instructional experiences," "The internet will take the place of school libraries in conducting research for class assignments," "Agriculture teachers will teach classes at a distance via videoconferencing," "FFA career development activities will be conducted via videoconferencing," "Videoconferencing will reduce the number of instructional field trips taken to agricultural related sites," "The majority of student assignments and presentations will be conducted through multimedia," and "The majority of instructor presentations will be conducted through multimedia." Overall, these findings are dissimilar to Murphy and Terry's (1998) nationwide Delphi study in which they found agriculture teachers reaching a level of agreement in relation to similar statements in the area of instructional technology. In general agriculture teachers in North Carolina and Virginia in relation to this study were undecided as to the future of instructional technology in secondary agricultural education curricula, unlike the results of Murphy and Terry (1998).

Demographic and program data was collected with section three of the survey. The majority of respondents in this study were male. The average age of North Carolina and Virginia agricultural teachers was forty. The majority of teachers in this study held a master’s degree. Teachers in both states respectively had taught secondary agriculture for fourteen years. Teachers in North Carolina and Virginia on average had taken 25 hours of instructional technology training. A great proportion of North Carolina and Virginia agricultural teachers had home computers and Internet access. The majority of home computers were PC (IBM compatible) computers. Regarding program variables the average program in North Carolina and Virginia had an enrollment of 101 and 97 respectively. The average FFA membership for North Carolina and Virginia agricultural programs was 77 and 71 respectively. The majority of agricultural teachers taught subjects such as horticulture, agricultural mechanics, agricultural science, and animal science. In relation to program variables the bulk of computers in North Carolina and Virginia secondary agricultural programs were PC (IBM compatible).

Table 3. *Instructional Technology's Future Role In Agricultural Education (n = 195)*

North Carolina				**Virginia**			**Total**		
Future Roles	**Mean**	**SD**	**Rank**	**Mean**	**SD**	**Rank**	**Mean**	**SD**	**Rank**
Videoconferencing will be used to integrate resource Persons into the classroom.	3.35	.97	2	3.51	1.03	2	3.44	1.01	2
CD-ROM will take the place of many textbooks in teaching the agricultural sciences.	3.15	1.14	3	3.23	1.19	5	3.19	1.16	5
Virtual simulations will reduce the need for live instructional experiences.	2.45	1.26	8	2.74	1.28	10	2.61	1.28	10
The internet will take the place of school libraries in conducting research for class assignments.	2.84	1.21	7	3.02	1.12	7	2.94	1.16	9
Agriculture teachers will have access to Lesson plans via the internet.	3.80	.91	1	3.75	.88	1	3.77	.89	1
Agriculture teachers will teach classes at a distance via videoconferencing.	3.15	1.02	3	3.20	1.07	6	3.18	1.05	6
FFA career development activities will be Conducted via videoconferencing.	2.75	1.11	6	2.94	1.10	8	2.86	1.11	8
Videoconferencing will reduce the number of instructional field trips taken to agricultural related sites.	2.85	1.14	5	2.89	1.20	9	2.87	1.17	7
The majority of student assignments and Presentations will be conducted through multimedia.	3.08	1.07	4	3.30	1.08	4	3.21	1.08	4
The majority of instructor presentations Will be conducted through multimedia.	3.15	1.11	3	3.35	1.14	3	3.27	1.13	3

Note: Based on scale: 1 = Strongly Disagree, 2 = Disagree, 3 = Undecided/ Neutral, 4 = Agree, 5 = Strongly Agree

Conclusions

The focus of objective one was to determine the future role that instructional technology will play in secondary agricultural education curricula. Agricultural teachers were relatively neutral on the majority of statements regarding the future role that instructional technology will play in secondary agricultural education curricula. North Carolina and Virginia secondary agriculture teachers reached agreement on one statement regarding the future role of instructional technology: "Agriculture teachers will have access to lesson plans via the Internet." Overall secondary agriculture teachers in North Carolina and Virginia took a neutral stance in relation to their perceptions towards the future of instructional technology in their respective programs. This was in direct contrast to the whole premise behind the North Carolina and Virginia technology plans, in which instructional technology was considered to be an essential component of the educational futures of both states.

The focus of objective two was to determine the potential barriers and benefits towards the implementation of instructional technology in secondary agricultural education curricula. Respondents tended to believe that there were many benefits to implementing instructional technology in secondary agricultural education curricula. As was the case in Murphy and Terry's (1998) study responses tended to be related to the following four areas: (1) an increase in the availability of educational opportunities, (2) improved informational resources for faculty and students, (3) more effective instructional materials, and (4) more convenient delivery methods for instructors. The aforementioned findings directly relate to the whole premise behind North Carolina and Virginia's technology plans.

Recommendations

1. School administrators should ensure that adequate technical support is provided for secondary agricultural education teachers in North Carolina and Virginia. This technical support may be provided through actual on-site visits, telephone, email, or through the Internet. Additionally, one teacher could be designated and trained as the school's technology specialist, which could provide teachers with onsite technology help.

2. In-service workshops should be provided to secondary agricultural education teachers in North Carolina and Virginia in an attempt to increase their skills in the area of instructional technology. By conducting in-service workshops perhaps secondary agricultural education teachers in Virginia who were undecided on the future of instructional technology in secondary agricultural education, may begin to see its instructional benefits.

3. North Carolina and Virginia secondary agricultural education teachers should inform school administrators, legislators, and local agricultural businesses about the need for funding to equip their agriculture programs with the latest in instructional technology equipment.

4. Pre-service agricultural education in North Carolina and Virginia should have a strong emphasis in the area of instructional technology. By implementing instructional technology into pre-service training new agricultural education teachers will be competent and have the skills needed to prepare students for the highly technological world of work.

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Instructional Technology Utilization and Availability in North Carolina and Virginia Secondary Agricultural Education Programs

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Introduction/ Rationale

The United States leads the world in agricultural productivity and research. According to Reinventing Agricultural Education for the Year 2020 (a visioning and planning initiative of the National FFA Organization, 1999), the United States leading position in agriculture "lies in part because of its infrastructure for developing and delivery technology, including agricultural education programs in our public schools" (National FFA Organization, 1999). This network of scientist and educators has served the country well, but has begun to show a degree of wear, a great deal of this concerns the rapid pace of change that comes with technological innovation. Current curriculum development initiatives and educational delivery approaches in local school districts around the nation have not kept pace with the rate of technological change that the United States has experienced over the past decade (National FFA Organization, 1999). "Rather than reacting to change as it comes "a passive approach" the agricultural education community must take a proactive stance and look ahead to develop a cohesive vision of its preferred future decade" (National FFA Organization, 1999). The National Research Council (1988) in the book Understanding Agriculture, emphasized that in order for agricultural education to remain viable educators should emulate the best current programs while generating new ways to deliver agricultural education.

The integration of instructional technology into the secondary level of public education has become a major priority of both the North Carolina Department of Public Instruction and the Virginia Department of Education. The Six-Year Educational Technology Plan for Virginia (1996-2000) emerged out of the awareness that technology is not simply equipment, but a systematic treatment of information and instructional content in a specialized way to achieve a specific purpose. Technology according to Virginia's plan is not an end or goal in itself, but a means to achieve the goal of enabling all students to learn to their potential (Virginia Department of Public Education: Division of Technology, 1996). "Teachers must be trained, support services must be provided, pilot studies must be initiated, equipment must be updated and maintained, guidelines must be developed, new technologies must be introduced, and an on-going program of evaluation must be established" (Virginia Department of Public Education: Division of Technology, 1996). Policy-makers in North Carolina also recognize the importance and urgent need for instructional technology infusion into the public educational system (K-12). In 1995, educators in North Carolina, initiated a five-year plan entitled the Long-Range Technology Plan in order to address the need for instructional technology infusion in public education throughout the state (Milken Exchange, 1999). In the Long Range State Technology

Plan (1999) it states that the classroom is the "focal point" for teaching and learning; therefore, the standard for creating technology-supported schools should be centered on it. Two important factors will characterize a technology-supported classroom in North Carolina: 1. Equipped with diverse options for teaching and learning that only technology can offer or make possible, and 2. Managed by a knowledgeable, skilled, and motivated teacher who is both comfortable and creative with technology (North Carolina Department of Public Instruction, 1999).

The North Carolina Technology Commission considers vocational education under which agricultural education is classified, a high priority division for instructional technology infusion. Competency based programs in vocational education will involve instructional technologies in order to prepare students for employment in emerging occupations, for participation in advanced or highly-skilled post secondary education, and with lab experiences that assist them in making informed decisions and in the application of practical life skills (North Carolina Department of Public Instruction, 1999). The North Carolina School Technology Commission's vision for North Carolina students is that "all students will be enabled by technology to solve problems, improve their productivity, and gain the skills necessary to become contributing members of their community and life-long learners" (North Carolina Department of Public Instruction, 1999). With this vision in mind North Carolina secondary agricultural educators must prepare themselves for this emerging wave of change. For both the states of North Carolina and Virginia instructional technology infusion into agricultural education is vital.

Theoretical Framework

"Computerized instruction should be included in secondary vocational agriculture programs to teach computer literacy, a needed skill in agricultural occupations, and to enhance student learning" (Rodenstein & Lambert, 1982, p. 41). Research on how agricultural education teachers utilize computer technology in their programs is essential to the overall vitality of the agricultural education profession. Miller and Kotrlik (1987) found that agricultural education teachers mainly used computers to manage grades, classes, and teaching materials. In contrast, Nordheim and Connors (1997) found the majority of agricultural education programs in the northwest using computers for instructor related task such as writing tests, creating class assignments, student grades, correspondence, and curriculum development. The other major uses of the computer were FFA related activities: FFA Program of Activities, FFA mailings, and FFA news articles

Nordheim and Connors (1997) also surveyed northwest agricultural education teachers to determine the types of software used in agricultural education programs and their frequency of use with each type of software. The categories of software included: word processing, graphics presentations, spreadsheet programs, data base programs, financial software, Internet navigators, drafting programs, and course grading software. The majority of programs utilized some form of word processing software (Word Perfect, MS Word), with a great majority (57%) indicating daily use of the word-processing software. Microsoft PowerPoint (31%) was the most utilized graphics program, in comparison to 8% who used Word Perfect Presentations. On the average, agriculture teachers reported weekly use of graphics presentation software. Microsoft Excel was the major spreadsheet program utilized (35.6%), with the majority of agriculture programs reporting weekly use of spreadsheet programs. Microsoft Access was the most utilized database program with the majority of programs (26%) reporting daily use of database programs. Netscape Navigator was the most used Internet software (36.7%), with the overwhelming majority of agriculture programs reporting using the Internet daily.

Thompson and Connors (1998) conducted a study on the use of Internet by vocational education teachers in Idaho. The majority of teachers (40.3%) reported having used email "quite regular" in their programs. Vocational teachers reported using the Internet "sometime" for personal development, classroom instruction, and lesson planning in their programs. Holton and Newman (1996) suggested four ways in which the World Wide Web could be utilized in secondary agricultural education programs and the FFA: 1. As a source of instructional material to be used by the instructor in program planning, 2. As an instructional aid that provides research training for the students, 3. As a public relations tool that allows the placing of accomplishments and/or useful information on line for others to access, and 4. As a means for agricultural education programs and students to share information about what they are doing and learning.

In addition to instructional technology utilization, access to technology has become a major area of concern in the agricultural education community. In President Clinton's 1998 State of the Union Address, he stated that the day is not far off that every child will be able to stretch a hand over a keyboard and reach every book ever written, every painting ever painted, and every symphony ever composed (Clinton, 1998). Access to instructional technology is a major concern of agricultural educators and administrators nationwide (Miller & Miller, 1998; Nordheim & Connors, 1997; Layfield & Scanlon, 1999; Thompson & Connors, 1998). Nordheim and Connors (1997) in a study of Northwest agriculture teachers found that the majority of secondary agriculture programs had access to computers. In relation to Internet technology access, secondary agricultural education programs are becoming increasingly connected to the Internet. Thompson and Connors (1998) in a study of Internet use by vocational education teachers in Idaho found 44% of teachers could gain access to the Internet at both school and at home. "Of the access locations at school, the library was highest at 77%, followed by the computer lab at 73%, their classroom (62%), and their office at 32%" (Thompson and Connors, 1998, p. 289).

Purpose and Objectives

The purpose of this descriptive/correlational study was to evaluate instructional technology availability and use in secondary agricultural education curricula in North Carolina and Virginia. Objectives of the study were:

1. To determine the frequency of utilization of various forms of instructional technology in secondary agricultural education curricula.

2. To determine the access agricultural education teachers have to various forms of instructional technology in their facilities.

3. To determine the perceptions of agricultural education teachers toward the implementation and utilization of various forms of instructional technology in secondary agricultural education curricula.

4. To determine the demographic and program characteristics of secondary agricultural education teachers in North Carolina and Virginia.

Methodology

An instrument was developed by the researcher based on the objectives of the study. Questions were adapted and modified from previous studies by the Instructional Technology Department of the Kansas City Public School District (1997), and Murphy and Terry (1998). Additional questions were added by the researcher to meet the research objectives. The completed instrument consisted of four sections, with section one consisting of two subsections. The sections were titled: Section I: (A) instructor's utilization of instructional technology tools, (B) student' utilization of instructional technology tools, Section II: access to selected instructional technology, Section III: priority of major goals for the use of computer technology, and Section IV: demographic and program variables. Sections one through three contained Likert-type items, while section four contained a mixture of open-ended questions and Likert-type items. The validity of the instrument was established by means of content and face validity. A panel of experts constituting the researchers graduate committee analyzed the instrument for content validity. Face validity was established during a pilot study consisting of 40 Iowa secondary agriculture teachers. On April 15, 1999, 40 Iowa secondary agriculture teachers were mailed a preliminary survey and given two weeks to complete and return the survey. After two weeks sixteen surveys had been returned. After all pilot surveys had been collected, instrument reliability was determined by utilizing Chronbach's Coefficient Alpha. Chronbach's Coefficient Alpha for sections one through three was .79, .87, and .75 respectively. After the reliability level was determined, a few questions were deleted and others adjusted.

The population for this descriptive survey study consisted of secondary agriculture teachers in North Carolina and Virginia that were listed in the 1998-99 North Carolina Agricultural Education Directory (N = 370) and Virginia Vocational Agriculture Teacher's Association Directory (N = 313). Based on Krejcie and Morgan's (1970) formula for a 5% margin of error, a random sample of 242 would be required for a population of this size. As is the nature of survey research a certain loss rate can be expected. In an attempt to achieve the target sample size of 242, the researcher investigated the return rate of similar studies in agricultural education in the area of instructional technology. Thompson and Connors (1998) obtained a 70% return rate, Layfield and Scanlon (1999) realized a 46% return rate, Nordheim and Connors (1997) received a 72% return rate, and Miller and Miller (1998) obtained return rates of 73% and 66% respectively. After a thorough analysis of these studies the researcher concluded that 65% could be expected to be returned. In order to account for the potential loss rate, 380 agricultural teachers were sampled. This sample size was calculated by taking the desired return rate of 65% and the target sample size of 242 into account. Two hundred forty-two comprises 65% of 380; by utilizing this logic the researcher was more confident in obtaining the target return of 242 agricultural education teachers across both states. The Statistical Package for the Social Sciences, Personal Computer Version 7.0, and Microsoft Excel were used to generate random numbers for the sample selection. The stratified random sample was drawn from the population of agricultural education teachers in North Carolina (N = 370) and Virginia (N = 313). After the random numbers were generated 210 agricultural education teachers from

North Carolina and 170 from Virginia were selected for the study. Elements of Dillman's Total Design Method (1978) were utilized to achieve an optimal return rate. On May 21, 1999, 380 surveys were mailed to randomly selected teachers across the states of North Carolina and Virginia. Along with the survey, and return stamped envelope, teachers received a cover letter from the researcher and researcher's major professor outlining the purpose of the research. In addition to these materials, teachers from North Carolina also received a letter from the North Carolina - State Agricultural Education Director, in support of this research. Teachers in Virginia received a similar letter from the chairperson of the agricultural education department at Virginia Polytechnic and State University. After two weeks, 122 surveys had been received. A follow-up letter was mailed to non-respondents, after two more weeks 43 more surveys had been received. On June 17, 1999, 225 surveys were mailed to all non-respondents along with another cover letter and a return stamped envelope. Non-respondents were given a deadline of July 31, 1999 to return the survey.

By July 1, 1999, 40 more surveys had been received for a final return rate of 53% (200 surveys). Readers should note that even though only 200 surveys were returned of the 380 mailed, 200 comprised 83 % of the target goal of 242. This was considered highly acceptable by the researcher. Of the 200 surveys that were returned 195 were useable (NC = 85, VA = 110). Five surveys were lost due to frame error, and five surveys were returned unusable, mainly due to being incompletely filled out. Non-response error was handled by utilizing the "double-dip procedure" (Miller and Smith, 1983). Ten percent of the non-respondents were telephoned and asked selected questions from the survey. After this was accomplished t-test were conducted to compare the answers of respondents versus non-respondents, no statistically significant differences could be found between the two groups.

Findings

Table 1 presents the means, standard deviations, and rankings on the frequency of utilization of various forms of instructional technology by North Carolina and Virginia secondary agricultural education teachers. For purpose of data analysis readers should interpret the scales for tables 1 and 2 utilizing the following specifications: 1- 1.49 = none, 1.50 - 2.49 = 1- 30 minutes, 2.50 - 3.49 = 31 - 60 minutes, 3.50 - 4.49 = 61 - 90 minutes, 4.50 - 5.00 = more than 90 minutes. Videotapes and television were ranked the most high as being utilized between 1-30 minutes per day for daily instructional activities. Agriculture teachers in both North Carolina and Virginia also ranked desktop computers, compact disk, and laser printers as being utilized between 1-30 minutes per day for daily instructional activities. The Internet and email were also technologies ranked by agricultural education teachers as being utilized at least 1-30 minutes per day in North Carolina and Virginia.

Table 2 shows the means, standards deviations, and rankings for the frequency of utilization North Carolina and Virginia secondary agricultural education students had in relation to selected instructional technology tools. Technologies such as videotape and television were ranked the most high as being utilized between 1-30 minutes per day by North Carolina and Virginia secondary agriculture students for instructional activities. Secondary agriculture students also ranked desktop computers as being utilized between 1 - 30 minutes daily in North Carolina and Virginia.

Table 3 presents the means, standard deviations, and rankings for statements related to the access North Carolina and Virginia secondary agricultural education teachers had in relation to selected instructional technology tools. For the purpose of data analysis readers should utilize the following specifications for interpreting the scale for table 3: 1 - 1.49 = Constant classroom access, 1.50 - 2.49 = No classroom access, but adequate access in my building, 2.50 - 3.49 = In building but not easily accessible to me, 3.50 - 4.49 = No access in building. Videotape, television, and desktop computers were considered to be the most accessible technologies for North Carolina and Virginia agricultural education teachers. Video cameras, CD-ROM, laser printers, the Internet, and email were technologies that were considered relatively accessible to North Carolina and Virginia agricultural education teachers.

Table 1. *North Carolina and Virginia Secondary Agricultural Education Teachers' Utilization of Instructional Technology Tools (n = 195)*

North Carolina				**Virginia**			**Total**		
Instructional Tool	**Mean**	**SD**	**Rank**	**Mean**	**SD**	**Rank**	**Mean**	**SD**	**Rank**
Videotape	1.89	.71	2	1.72	.73	2	1.79	.72	2
Television	1.71	.78	4	1.55	.75	4	1.62	.77	4
Video Camera	1.25	.49	8	1.21	.51	11	1.23	.50	9
Laser Disk Player	1.13	.43	12	1.38	.83	6	1.27	.70	7
Desktop Computer	2.21	1.07	1	1.87	1.15	1	2.02	1.13	1
Laptop Computer	1.18	.44	10	1.24	.51	9	1.21	.48	11
CD-ROM	1.55	.66	5	1.50	.82	5	1.52	.76	6
Digital Camera	1.15	.36	11	1.33	.61	7	1.25	.52	8
Full Page Scanner	1.22	.56	9	1.21	.49	11	1.22	.52	10
Laser Printer	1.52	.77	6	1.56	.91	3	1.54	.85	5
Computer Projector	1.25	.69	8	1.22	.56	10	1.23	.62	9
LCD Panel	1.27	.73	7	1.27	.60	8	1.27	.66	7
Internet	1.79	.99	3	1.72	.89	2	1.75	.93	3
Email	1.55	.78	5	1.50	.69	5	1.52	.73	6
DTN or Farm Dayta	1.22	.73	9	1.19	.44	12	1.21	.58	11

Note: Based on scale: 1 = none, 2 = 1-30 minutes, 3 = 31-60 minutes, 4 = 61-90 minutes, 5 = more than 90 minutes

Table 2. *North Carolina and Virginia Secondary Agricultural Education Student's Utilization of Instructional Technology Tools (n = 195)*

North Carolina				Virginia			Total		
Instructional Tool	**Mean**	**SD**	**Rank**	**Mean**	**SD**	**Rank**	**Mean**	**SD**	**Rank**
Videotape	1.69	.62	1	1.65	.69	2	1.67	.66	2
Television	1.53	.65	4	1.57	.71	3	1.55	.68	3
Video Camera	1.15	.39	10	1.22	.50	8	1.19	.45	8
Laser Disk Player	1.07	.30	13	1.22	.55	8	1.15	.46	11
Desktop Computer	1.69	.86	2	1.67	.78	1	1.68	.81	1
Laptop Computer	1.16	.37	9	1.19	.39	10	1.18	.38	9
CD-ROM	1.39	.62	5	1.43	.64	4	1.41	.63	5
Digital Camera	1.06	.24	14	1.18	.47	11	1.13	.39	13
Full Page Scanner	1.16	.43	9	1.19	.44	10	1.18	.44	9
Laser Printer	1.31	.60	6	1.27	.56	7	1.29	.57	7
Computer Projector	1.11	.49	12	1.17	.47	12	1.14	.48	12
LCD Panel	1.19	.68	8	1.16	.42	13	1.17	.55	10
Internet	1.55	.78	3	1.41	.58	5	1.47	.68	4
Email	1.28	.75	7	1.38	1.11	6	1.34	.97	6
DTN or Farm Dayta	1.13	.51	11	1.21	.53	9	1.17	.52	10

Note: Based on scale: 1 = none, 2 = 1-30 minutes, 3 = 31-60 minutes, 4 = 61-90 minutes, 5 = more than 90 minutes

Table 3. *North Carolina and Virginia Secondary Agricultural Education Teachers' Access to Selected Instructional Technology Tools (n = 195)*

	North Carolina			Virginia			Total		
Instructional Tool	**Mean**	**SD**	**Rank**	**Mean**	**SD**	**Rank**	**Mean**	**SD**	**Rank**
Videotape	1.20	.65	13	1.36	.71	13	1.29	.69	12
Television	1.19	.65	14	1.30	.58	14	1.25	.61	13
Video Camera	2.20	1.03	7	2.02	.95	8	2.10	.99	6
Laser Disk Player	2.79	1.13	4	2.57	1.10	3	2.67	1.12	3
Desktop Computer	1.25	.60	12	1.52	.82	12	1.40	.74	11
Laptop Computer	2.75	1.19	5	2.42	1.24	4	2.56	1.23	4
CD-ROM	1.62	.94	11	1.79	1.01	10	1.72	.98	10
Digital Camera	2.81	1.11	3	2.36	1.16	6	2.56	1.15	4
Full Page Scanner	2.58	1.15	6	2.29	1.09	7	2.42	1.12	5
Laser Printer	2.01	1.12	8	2.02	1.11	8	2.02	1.11	7
Computer Projector	2.78	1.12	5	2.39	1.10	5	2.56	1.12	4
LCD Panel	2.95	1.12	2	2.62	1.21	2	2.76	1.18	2
Internet	1.81	.98	10	1.80	.97	9	1.81	.97	9
Email	1.99	1.10	9	1.71	.92	11	1.83	1.01	8
DTN or Farm Dayta	3.02	1.23	1	2.75	1.36	1	2.87	1.31	1

Note: Based on scale: 1 = Constant classroom access, 2 = No classroom access, but adequate access in my building, 3 = In building but not easily accessible to me, 4 = No access in building

Table 4 presents the means, standard deviations, and rankings for statements related to the priority of major goals for the use of computer technology, in relation to the daily instructional activities of secondary agricultural education programs in North Carolina and Virginia. For purpose of data analysis readers should interpret the scale for table 4 utilizing the following specifications: 1 - 1.49 = Very Low Priority, 1.50 - 2.49 = Low Priority, 2.50 - 3.49 = Moderate Priority, 3.50 - 4.49 = High Priority, 4.50 - 5.00 = Very High Priority. North Carolina and Virginia secondary agricultural education teachers considered technologies such as word processing software, databases, reference software, spreadsheets, content area tutorial/drill and practice software, and the Internet to be essential tools for their daily instructional activities

Demographic and program data was collected with section four of the survey. The majority of respondents in this study were male. The average age of North Carolina and Virginia agricultural teachers was forty. The majority of teachers in this study held a master's degree. Teachers in both states respectively had taught secondary agriculture for fourteen years. Teachers in North Carolina and Virginia on average had taken 25 hours of instructional technology training. A great proportion of North Carolina and Virginia agricultural teachers had home computers and Internet access. The majority of home computers were PC (IBM compatible) computers. Regarding program variables the average program in North Carolina and Virginia had an enrollment of 101 and 97 respectively. The average FFA membership for North Carolina and Virginia agricultural programs was 77 and 71 respectively. The majority of agricultural teachers taught subjects such as horticulture, agricultural mechanics, agricultural science, and animal science. In relation to program variables the bulk of computers in North Carolina and Virginia secondary agricultural programs were PC (IBM compatible).

Table 4. *North Carolina and Virginia Secondary Agricultural Education Teachers' Priority of Major Goals for the Use of Computer Technology (n = 195)*

	North Carolina			**Virginia**			**Total**		
Computer Utilization Categories	**Mean**	**SD**	**Rank**	**Mean**	**SD**	**Rank**	**Mean**	**SD**	**Rank**
Information access and research:	3.14	1.08	2	2.46	1.32	4	2.76	1.26	2
Internet Research CD-ROM	2.74	1.10	5	2.29	1.28	7	2.49	1.22	7
Software Reference Software	2.81	1.19	3	2.27	1.19	8	2.51	1.20	6
Communications Email	2.65	1.37	6	2.26	1.47	9	2.43	1.44	8
Chat Rooms Discussion	1.42	.73	12	1.33	.76	13	1.37	.74	13
Groups	1.76	1.10	11	1.48	.82	12	1.61	.96	12
Data/Information Analysis	2.76	1.51	4	2.39	1.29	5	2.55	1.40	4
Databases Spreadsheets	2.39	1.29	7	2.48	1.27	3	2.54	1.24	5
Graphing Software	2.16	1.16	10	1.83	1.03	11	1.97	1.10	11
Publication/Information	3.73	1.29	1	3.70	1.44	1	3.71	1.38	1
Production Word Processing	2.25	1.19	9	2.23	1.32	10	2.24	1.27	10
Web Page Production Draw/paint programs	2.26	1.26	8	2.33	1.38	6	2.30	1.33	9
Content area tutorials or Drill and practice	2.76	1.28	4	2.57	1.35	2	2.66	1.32	3

Note: Based on scale: 1 = Very Low Priority, 2 = Low Priority 3 = Moderate Priority, 4 = High Priority, 5 = Very High Priority

Conclusions

The majority of instructional technologies utilized in North Carolina and Virginia secondary agricultural education programs between 1 - 30 minutes per day were computer related technologies such as desktop computers, CD-ROM's, laser printers, Internet, and email. This would indicate that North Carolina and Virginia secondary agricultural education considered computer technologies to be an essential component of their daily instructional activities. Perhaps desktop computers were utilized for activities such as writing tests, creating class assignments, student grades, correspondence, and curriculum development. Technologies such as CD-ROM's and the Internet more than likely were utilized for research to develop curriculum materials for secondary agricultural education students. Email could have been utilized by secondary agricultural education teachers in North Carolina and Virginia to correspond with other agriculture teachers, university agricultural education personnel, legislators, and agricultural businesses about issues concerning their respective secondary agriculture programs. Secondary agricultural education teachers in North Carolina and Virginia for daily instructional activities utilized other instructional technologies such as videotapes and television between 1 - 30 minutes. Technologies such as these were more than likely utilized by North Carolina and Virginia secondary agricultural education teachers to present programs concerning issues impacting the agriculture industry not only nationally but from the international perspective as well.

North Carolina and Virginia secondary agricultural education teachers indicated that their students utilized desktop computers between 1 - 30 minutes per day for instructional activities. The most interesting finding concerned Internet use. North Carolina secondary agricultural education students were more likely to utilize the Internet between 1 - 30 minutes per day for instructional activities, than Virginia secondary agricultural education students. Perhaps North Carolina secondary agricultural education teachers placed a higher priority upon Internet utilization for daily instructional activities than did Virginia secondary agricultural education teachers (Table 1). In relation to desktop computer utilization by North Carolina and Virginia secondary agricultural education students, more than likely the instructional task centered around word processing, database, spreadsheet, or content area tutorial/drill and practice software's (Table 4). Overall, North Carolina and Virginia secondary agricultural education teachers realized the importance of desktop computers for their students' daily instructional activities.

Overall, North Carolina and Virginia secondary agricultural education teachers had adequate access to the majority of instructional technologies surveyed. The greatest access centered around television and videotape. This is supported by the aforementioned findings of North Carolina and Virginia secondary agricultural education teachers and students' utilization of these instructional technologies. Perhaps this can also be attributed to the low cost of VCR's. Computer related technologies such as laser printers, desktop computers, email, Internet, and CD-ROM's were all adequately accessible to North Carolina and Virginia secondary agricultural education teachers. Again as with videotape and television this degree of access is supported by the amount of time North Carolina and Virginia secondary agriculture education teachers indicated utilizing these technologies.

North Carolina and Virginia secondary agricultural education teachers considered information access and research software such as the Internet and reference software to be a priority in their daily instructional activities. Perhaps North Carolina and Virginia secondary agricultural education teachers are utilizing the Internet and reference software for acquiring problem solving and decision-making skills. With the aim of education moving toward a constructivist environment, students should be provided with every opportunity to practice problem solving skills and decision-making skills teacher (Simonson & Thompson, 1997). Lastly content area tutorial/ drill and practice software was considered to be a priority in North Carolina and Virginia secondary agricultural education programs. Perhaps North Carolina and Virginia secondary agricultural education teachers understood the importance of repetition and practice in order for students to master the competencies as outlined in their respective curricula.

Recommendations

1. In order to improve access to the instructional technologies included in this research study, school administrators should provide adequate facilities so these technologies may be efficiently utilized. This can either be done through the construction of new facilities or the renovation of existing facilities.

2. North Carolina and Virginia secondary agricultural education teachers should educate school administrators and legislators concerning the need funding to equip their agriculture programs with the latest in instructional technology equipment. Constant classroom access to instructional technology is imperative for instructional technology to have a significant impact upon secondary agriculture students. Alternative funding for instructional technology should also be sought through local agricultural businesses.

3. Technologies such as the Internet, spreadsheets, databases, reference software, word processing software, live television, videotape, and content area tutorials/drill and practice software should be more actively utilized to encourage problem solving and critical thinking skills in relation to agricultural concepts in daily instructional activities. This utilization should be implemented with the aid of constructivist principles.

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Factors Related to the Intent of Agriculture Educators to Adopt Integrated Agricultural Biotechnology Curriculum

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Abstract

Recent legislation encourages the integration of academic content in agricultural education. In North Carolina, high school agricultural education programs can now choose to offer a state adopted integrated biotechnology curriculum. Empirical evidence was needed to identify and describe factors related to the intent of agricultural educators to adopt this curriculum in order to assist teachers during this transition.

North Carolina agricultural educators were randomly surveyed to determine their self-perceived level of knowledge, actual level of knowledge and perceived importance of integrated science competencies in the new North Carolina “Biotechnology and Agriscience Research” course. This descriptive and correlational study also described how agricultural educators perceived the course in fulfilling program needs, perceived barriers to teaching the course, and the likelihood of agricultural educators in North Carolina adopting the course. Exploratory research was conducted to identify factors that best predicted the intent of agricultural educators to adopt the course.

Agricultural educators accurately perceive that they lack the knowledge to teach the Biotechnology and Agriscience Research course. The majority of North Carolina agricultural educators have not participated in training related to biotechnology. Therefore they are ill prepared to teach concepts related to this emerging technology. Agricultural educators support the importance of teaching biotechnology and recognize the benefits of integrated curriculum in agricultural education. Agricultural educators perceive that the exterior factors of funding, equipment and teacher knowledge are the largest barriers to adopting integrated science curriculum. The Biotechnology and Agriscience Research course has the necessary support of agricultural educators to propose its continued inclusion in the North Carolina Workforce Development program of studies. Teachers who are most likely to adopt the Biotechnology and Agriscience Research course have fewer years of teaching experience, have attended some biotechnology training and perceive integrated biotechnology curriculum will fulfill their agricultural education program needs.

Introduction

In recent years, curriculum integration of science and agriculture has accelerated due to the biological revolution that requires the agriculturist to understand more science. Martin, Rajasekaran & Vold (1989) reported that students of agriculture must learn the biosciences, as they are the foundation of the industry of agriculture. The integration of agriculture and science curriculum has also been inspired by educational reform legislation. Since the mid-1930s the United States Department of Education has endorsed the integration of vocational and academic studies (Moss, 1990). Horne and Key (1993) reported that biotechnology is one subject area that readily integrates science and agriculture.

In 1999, North Carolina education and industry experts developed a course titled "Biotechnology and Agriscience Research" based on the standards identified in "The National Voluntary Occupational Skill Standards for an Agricultural Biotechnology Technician". The Biotechnology and Agriscience Research course reflects the theory of the reinforcement model of integration by infusing academic content into vocational education curriculum. The National Agricultural Education Council sponsored the development of an accompanying curriculum guide titled "Biotechnology for Plants, Animals, and the Environment" that is now available to secondary agricultural education programs nationwide.

Beginning in 2000-2001, North Carolina high schools will be able to offer a state adopted integrated agricultural biotechnology course that has been developed as a cooperative effort between industry and education. It is not known whether teachers in the state will adopt this innovative course as a part of their local course offerings. North Carolina agricultural educational consultants need empirical evidence to identify factors related to the intent of agricultural educators to adopt this curriculum in order to assist teachers in the future transition of curriculum adoption. Rudd and Hillison (1995) reported that data related to the adoption of agriscience curriculum could provide insight for agricultural education curriculum efforts in the future.

Theoretical Framework

The theoretical framework for this study was derived from a review of the existing literature regarding motivation theory. The intent of teachers to adopt integrated curriculum is directly related to this area of psychological theory. Finch, Schmidt and Faulkner (1992) emphasized the importance of motivational theory to the educational movement of curriculum integration when they stated, "teachers must ultimately have the need and desire to integrate vocational and academic education. You can lead teachers to school, but you cannot make them integrate" (p.11).

Edwin Locke's schema of motivation in Figure 1 was chosen as the theoretical framework for this study because it encompasses a combination of the most well-known and accepted motivation theories and puts them in a logical sequence. In this sequence, Locke (1991) hypothesizes that the motivation theories support one another and the weaknesses they possess when alone are diminished.

Locke (1991) stated, “the field of work motivation has become increasingly confused over the past decades. The major cause of confusion has been a plethora of theories and paucity of frameworks for integrating them. A major but seldom-recognized reason for the difficulty is that most of the theories pertain to different aspects of the motivational sequence”(p.288).

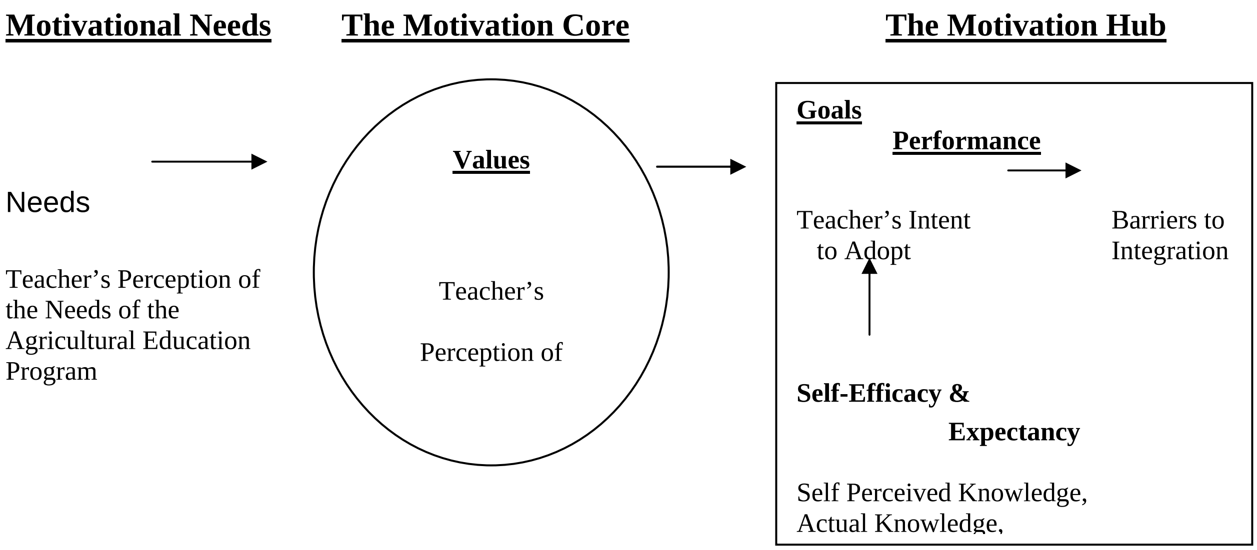

Figure 1. *Application of Locke’s Motivation Sequence to the Intent of Agricultural Educators to Adopt Integrated Biotechnology Curriculum.*

Studies exist that suggest that agricultural educators perceive a need for integrated biotechnology curriculum. Brown, Kemp and Hall (1998) reported that 69% of the science, technology education and agricultural education teachers in Kentucky supported a need for teaching integrated biotechnology curriculum in their schools. Agricultural educators who had participated in the National FFA Agriscience Teacher of the Year at the state and national level perceived a need for the integration of science into agricultural education according to Thompson (1998). They believed that by integrating science into agricultural courses, students had a better understanding of science concepts and their application in agriculture.

Several studies have found an agricultural educator’s perceived value of a curriculum is a meaningful predictor of the adoption of curriculum. Rudd and Hillison (1995) found that a teacher’s expectations of an agriscience curriculum was a moderate predictor of the amount of agriscience curriculum that was adopted in agricultural middle school programs in Virginia. Although some studies conclude that the integration of science is valued, not all research concludes that this is the case. Bottoms, Presson & Johnson (1992) found that only one in ten vocational teachers believed it is important to teach science concepts in an applied manner and only two in ten reported that they could do it well.

Newman and Johnson (1994) found that, in Mississippi, teachers perceived the importance of biotechnology in their Agriscience I course to be very important, but they also felt they possessed the lowest competence in this area. Rudd and Hillison (1995) researched the adoption of a new middle grade agriscience curriculum in Virginia. They found that that the self-perceived knowledge of agriscience middle grade agricultural teachers in Virginia was the best predictor of 13 variables to predict the amount of the agriscience curriculum that was adopted and taught. Thompson and Balschweid (1999) found that 84% of the agricultural educators in a study of Oregon Agricultural Science and Technology teachers had attended at least one integration workshop and 72% of these respondents indicated that they strongly agreed or agreed that they felt prepared to teach integrated biological concepts. This high rate of self-perceived ability might be related to the fact that all the agricultural educators had received some training.

Roberson, Flowers, and Moore (1997) concluded that a lack of teacher support for educational reform in North Carolina might be due to the many barriers teachers perceive in integrating vocational and academic curriculum. These perceived barriers are important to integration efforts as Pritz and Davis (1990) reported the reluctance of teachers to change as a result of these perceptions as suggested by expectancy theory. Thompson and Balschweid (1999) found that Oregon agricultural educators surveyed felt that lack of equipment, training and funding were significant barriers to integrating science in agricultural education. Many other studies (Roberson, Flowers & Moore, 1998; Thompson & Schumacher, 1997; Newman & Johnson, 1994) have also found that teachers perceive a lack of agriscience training as a barrier to integrating agriscience in agricultural education.

Purpose of the Study

The purpose of the study was to identify and describe factors related to North Carolina high school agricultural teachers' intent to adopt integrated agricultural biotechnology curriculum.
More specifically, the study intended to answer the following research questions:

1. What is the self-perceived level of knowledge possessed by agricultural educators of integrated science competencies in "Biotechnology and Agriscience Research"?
2. What is the actual level of knowledge possessed by agricultural educators of integrated science competencies in "Biotechnology and Agriscience Research"?
3. How do North Carolina agricultural educators perceive the importance of "Biotechnology and Agriscience Research" competencies in agricultural education?
4. Which agricultural education program needs do agricultural educators perceive "Biotechnology and Agriscience Research" will fulfill?
5. What is the intent of agricultural educators to adopt the "Biotechnology and Agriscience Research" course within the next six years?
6. What barriers do agricultural educators perceive to exist in teaching the "Biotechnology and Agriscience Research" course?
7. If barriers were not present, what is the best predictive model for the dependent variable of the intent of agricultural educators to adopt the "Biotechnology and Agriscience" course as related to the following independent variables; agricultural educators actual level of knowledge of the integrated biotechnology competencies, self-perceived level of knowledge of the integrated biotechnology competencies, perceived importance of the integrated biotechnology competencies, perceived fulfillment of program needs and the demographic factors of age, gender, number of years of teaching experience and number of completed

formal biotechnology courses or workshops?

Research Procedures Used

This was a descriptive/correlational study using responses from randomly selected agricultural teachers in North Carolina during the spring of 2000. A sample size of 173 from 313 teachers was determined using Cochran's formula for estimating sample size to determine the sample of a finite population (Cochran, 1977).

The instruments were reviewed by a panel of experts for content validity and pilot tested by 17 teachers who were not in the pool of randomly selected teachers. The reliability of the actual knowledge instrument was measured using the Kuder-Richardson 20 coefficient of internal consistency (Gall, Borg, and Gall, 1996). A Kuder-Richardson 20 coefficient of .81 was derived from the 35 test items. All of the multiple choice knowledge test items were considered reliable and were retained in the instrument. The stability of the questions related to teachers' perceptions were measured using the Product-Moment Correlation Coefficient (Pearson r). The initial pilot responses and the responses received two weeks later resulted in a coefficient of stability of

r = 83. The perception questions were considered stable and were not revised.

The randomly selected teachers were sent a cover letter, survey, scantron form and pencil by mail along with a self-addressed stamped return envelope on May 26, 2000. They were asked to return a completed scantron form and demographic response form in the return envelope by June 16, 2000.

The total response rate was 73% (n=126). According to Gay (1980) a response rate of 70% or higher reduces the risk of non-response error. Early and late respondents were compared as the basis for controlling non-response error. According to Miller and Smith (1983), late respondents are similar to non-responders. Those responses returned by June 16, 2000 were considered early respondents. Between June 16 and June 28, 2000 non-respondents were contacted by a mailed post card or phone call to encourage their participation. Responses returned between June 16 and July 5 were considered late respondents. A comparison of mean differences of the knowledge test between the two response groups resulted in t=1.55, df=1.24, p=. 124 (no significant difference). Thus, the late respondents were included in the total response pool and the resultant responding sample was assumed to be representative of the target population.

The statistical analyses used to interpret the data included descriptive statistics and correlational statistics. Descriptive statistics were used to determine the mean and measure of variance (standard deviation) of the perceived knowledge of agricultural educators of integrated science competencies in the Biotechnology and Agriscience Research course, their actual knowledge of integrated science objectives in the Biotechnology and Agriscience Research course, the needs they perceived that the Biotechnology and Agriscience Research course would fulfill, their perceived value of integrated science competencies in the Biotechnology and

Agriscience Research course, and the barriers they perceive exist in teaching the Biotechnology and Agriscience Research course.

Multiple regression analysis was used to determine the best model for explaining the variance associated with the intent to adopt the Biotechnology and Agriscience Research course by a linear combination of the independent variables. Stepwise elimination was used to determine the multiple regression model that best explained the dependent variable of the intent to adopt.

Findings

Demographics of participants measured by the study were teaching experience, age, gender and previous training. The mean total years of teaching experience of the respondents was 13.34 years. Twenty six percent of the respondents had less than 5 years of total teaching experience and 12% of the respondents had more than 25 years of total teaching experience. The mean age of the respondents was 39.27 years. Twenty three percent of the respondents were less than 30 years old and 15% of the respondents were older than 50 years old. Males constituted 76% ($\underline{n}$=96) and females constituted 24% ($\underline{n}$=30) of the data sample. The mean number of biotechnology in-service activities or courses taken by the respondents was 1.27. Over forty three percent of all respondents had not attended any in-service or courses related to biotechnology.

1. What is the self-perceived level of knowledge possessed by agricultural educators of integrated science competencies in the Biotechnology and Agriscience Research course? Agricultural educators perceived they were somewhat knowledgeable ($\underline{M}$=2.17) on a four point Likert–type scale of competencies in the course (see Table 1). They perceived themselves to be least competent in nucleic acid techniques ($\underline{M}$=1.65) and biochemistry concepts related to agriculture ($\underline{M}$=1.84). They perceived themselves to be most competent in basic concepts of genetics ($\underline{M}$=2.50) and the relationship of biotechnology to agriculture ($\underline{M}$=2.52).

2. What is the actual level of knowledge possessed by agricultural educators of integrated science competencies in "Biotechnology and Agriscience Research"? The mean test score for agricultural educators on a 35-item multiple-choice test was 24.09 (69%). More than 44% of the respondents answered less than 70% of the questions correctly.

3. How do North Carolina agricultural educators perceive the importance of "Biotechnology and Agriscience Research" competencies in agricultural education? The participant's overall mean importance response was 3.87 on a five point Likert-type scale indicating they felt the competencies overall were important to agricultural education. As shown in Table 2, they perceived nucleic acid techniques ($\underline{M}$=3.28) and biochemistry concepts related to agriculture ($\underline{M}$=3.63) to be the least important.

Table 1. *Mean Responses of Self-Perceived Knowledge by Competency*

Biotechnology and Agriscience Research Competencies	Mean	S.D.
Explore nucleic acid techniques used in agriculture.	1.65	0.79
Analyze basic concepts in biochemistry related to agricultural Biotechnology.	1.84	0.83
Analyze basic concepts in microbiology related to Agricultural biotechnology.	1.95	0.77
Analyze the potential social and environmental impacts of food Biotechnology processes and products.	2.00	0.76
Examine techniques and biological processes in food science Related to biotechnology.	2.03	0.76
Analyze the potential social and environmental impacts of Environmental biotechnology processes and products.	2.11	0.84
Examine techniques and biological processes in environmental Science related to biotechnology.	2.13	0.82
Analyze the potential social and environmental impacts of plant Biotechnology processes and products.	2.31	0.76
Analyze the potential social and environmental impacts of animal biotechnology processes and products.	2.35	0.80
Examine techniques and biological processes in animal science Related to biotechnology.	2.38	0.80
Examine techniques and biological processes in plant science Related to biotechnology.	2.39	0.77
Analyze basic concepts in genetics related to agricultural Biotechnology.	2.50	0.80
Analyze biotechnology and its relationship to agriculture.	2.52	0.72

4. Which agricultural education program needs do agricultural educators perceive "Biotechnology and Agriscience Research" will fulfill? Agricultural educators felt that 6 of the 7 program needs would be fulfilled by the Biotechnology and Agriscience course by responding with a mean response between 3.5 and 4.5 on a 5-point Likert-type scale (See Table 3). They did not feel that the course would appeal to or help students with lower academic abilities (M=2.33).

5. What is the intent of agricultural educators to adopt the "Biotechnology and Agriscience Research" course within the next six years? Over half (53%) of all agricultural educators indicated they were likely to adopt the course, 29% indicated they were uncertain and 18% indicated they were not likely to adopt the course if barriers did not exist.

Table 2. *Mean Responses of the Perceived Importance of Each Competency*

Biotechnology and Agriscience Research Competencies	**Mean**	**S.D.**
Explore nucleic acid techniques used in agriculture.	3.28	0.95
Analyze basic concepts in biochemistry related to agricultural biotechnology.	3.63	0.96
Analyze basic concepts in microbiology related to agricultural biotechnology.	3.72	0.90
Analyze the potential social and environmental impacts of environmental biotechnology processes and products.	3.79	0.94
Examine techniques and biological processes in food science related to biotechnology.	3.83	0.94
Analyze the potential social and environmental impacts of food biotechnology processes and products.	3.87	0.89
Examine techniques and biological processes in environmental science related to biotechnology.	3.89	0.85
Analyze the potential social and environmental impacts of animal biotechnology processes and products.	3.94	0.88
Analyze the potential social and environmental impacts of plant biotechnology processes and products.	4.00	0.97
Examine techniques and biological processes in plant science related to biotechnology.	4.03	0.98
Examine techniques and biological processes in animal science related to biotechnology.	4.06	0.89
Analyze basic concepts in genetics related to agricultural biotechnology.	4.11	0.90
Analyze biotechnology and its relationship to agriculture.	4.15	0.89

Table 3. *Mean Responses of the Perceived Program Need Fulfillment*

Program Needs	Mean	S.D.
Appeal to and help students with lower academic abilities.	2.33	0.92
Help gain support of the local administration for agricultural Education.	3.69	0.82
Provide my program with a course that will receive science Credit.	3.82	0.96
Better prepare my students for a future career in agriculture.	3.86	0.76
Help my students make choices concerning controversial Issues dealing with biotechnology.	4.03	0.80
Enhance the image of my agricultural education program.	4.06	0.70
Attract students with higher academic abilities.	4.07	0.85

6. What barriers do agricultural educators perceive to exist in teaching the “Biotechnology and Agriscience Research” course? As shown in Table 4, Agricultural educators perceived

equipment (M=3.26) and funding (M=3.08) to be the strongest barriers on a 4-point Likert-type scale. Lack of curriculum (M=2.99), knowledge (M=2.82), and training (M=2.75) were still perceived as barriers but not perceived to be as strong.

Table 4. *Mean Response for Barriers to Adopting Biotechnology and Agriscience Research*

Barriers To Adopting Biotechnology and Agriscience Research	Mean	S.D.
Lack of administrative support	1.98	0.90
Lack of student interest	2.23	0.77
Not enough time to plan	2.60	0.86
Insufficient teacher inservice and training	2.75	0.90
Lack of teacher knowledge	2.82	0.86
Insufficient curriculum and textbooks	2.99	0.84
Lack of funding	3.08	0.87
Lack of equipment	3.26	0.84

7. If barriers were not present, what is the best predictive model for the dependent variable of the intent of agricultural educators to adopt the "Biotechnology and Agriscience" course as related to the following independent variables; agricultural educators actual level of knowledge of the integrated biotechnology competencies, self-perceived level of knowledge of the integrated biotechnology competencies, perceived importance of the integrated biotechnology competencies, perceived fulfillment of program needs and the demographic factors of age, gender, number of years of teaching experience and number of completed formal biotechnology courses or workshops? Stepwise regression indicated that program needs fulfilled, training, and total years of teaching experience created the best fitting model to explain the dependent variable, intent to adopt. The model accounted for nearly 38% of the variance in North Carolina agricultural educators intent to adopt the course (See Table 5).

Table 5. *Best Fitting Predictive Model for Intent to Adopt the Biotechnology and Agriscience Research Course*

Model 1 Factors: Program Needs

Model	R	R Square	Adj. R Square	Std. Error
1	.531	.281	.276	1.84
2	.584	.341	.331	1.77
3	.612	.375	.359	1.73

Model 2 Factors: Program Needs, Training

Model 3 Factors: Program Needs, Training, Teaching Experience (fewer years)

Conclusions

Six conclusions were identified based on the purposes and findings of this study. They are presented here with related supporting data.

Agricultural educators accurately perceive that they lack the knowledge to teach the Biotechnology and Agriscience Research course. Nearly half of the agricultural educators surveyed were unable to pass a knowledge test created for high school students based on the Biotechnology and Agriscience Research course. The majority of agricultural educators are also aware of their lack of actual knowledge.

The majority of North Carolina agricultural educators have not participated in training related to biotechnology therefore they are ill prepared to teach concepts related to this emerging technology. Nearly half of all agricultural educators in North Carolina have never attended a biotechnology related course or in-service activity.

Agricultural educators support the importance of teaching biotechnology and recognize the benefits of integrated curriculum in agricultural education. Agricultural educators perceive that biotechnology related content is important and that by offering the course they will enhance the image of their program and better prepare students for the future. They also perceive that by teaching this curriculum their program will attract higher ability students and project a better image.

Agricultural educators perceive that the exterior factors of funding, equipment and teacher knowledge are the largest barriers to adopting integrated science curriculum. Recently, classroom and laboratory activities have been developed to teach the content of the Biotechnology and Agriscience Research course. Teachers are not aware that these new labs require less equipment and expense than those in older curriculum. Teachers do realize that they must possess knowledge of the content in order to teach the course.

The Biotechnology and Agriscience Research course has the necessary support of agricultural educators to propose its' continued inclusion in the North Carolina Workforce Development program of studies. The majority of agricultural educators in North Carolina intend to adopt the curriculum if exterior barriers are not present. New curriculum and resources are being developed that will overcome the perceived barriers of lack of funding and equipment.

Teachers who are most likely to adopt the Biotechnology and Agriscience Research course have fewer years of teaching experience, have attended some biotechnology training and perceive integrated biotechnology curriculum will fulfill their agricultural education program needs. These three independent factors created the best model for predicting agricultural educators intent to adopt the course in this study.

Implications and Discussion

The results of this study are supported in the literature by Locke's (1991) motivational sequence (Figure 1) that encompasses several theories of motivation. The results of this study indicate if teachers perceive the integrated biotechnology curriculum will fulfill a program need, such as improving the image of the program, they are more likely to be motivated to adopt the curriculum. Just as Locke illustrated in the first step of the motivational sequence (Figure 1), a teacher must have a perceived need of the curriculum.

Next according to Locke's motivation sequence, teachers must value the curriculum before they will consider its adoption. In this study, agricultural educators indicated they did perceive the content of the course to be an important subject to be taught in agricultural education.

In Locke's motivational sequence (Figure 1), an agricultural educator's low self-perceived and actual knowledge as described by this study may prevent the teacher from carrying out or performing the goal of adopting the integrated curriculum. Locke hypothesized that the self-efficacy and expectancy of an individual can be determined by their perceived or actual lack of knowledge.

This study did not find perceived or actual knowledge to be a predictor of the intent to adopt curriculum as Rudd and Hillison (1995) found in a study of Virginia middle school teachers. North Carolina agricultural educators may view their lack of knowledge as a factor that is stable and controllable, meaning they feel they possess the ability and administrative support to learn what they need to know to teach the course. Therefore, they possess the confidence to overcome this deficiency by attending training and studying the information.

North Carolina agricultural educators perceive that the Biotechnology and Agriscience Research course will fulfill many program needs but not all individual competencies are valued. Teachers were found to value the importance of individual scientific competencies into agricultural courses in many previous studies such as conducted by Brown et.al. (1998) as in this study. This inconsistency of the value of integrated science curriculum indicates that individual in-service groups should be preassessed to determine their attitudes and value of specific competencies so they can be addressed in training.

Barriers to adopting integrated curriculum as identified by many researchers seem to continue to exist in North Carolina. However, North Carolina agricultural educators seem unsure whether administrative support or student interests are still barriers. Administrative support for this type course may have increased over the past several years due to recent state and federal legislation that encourages curriculum integration. Student interest may be increasing due to the attention biotechnology has recently received in the media.

The implications for this exploratory study should be hopeful and encouraging to those who are attempting to carry out federal and state legislation guidelines that encourage the integration of curriculum. Agricultural educators in North Carolina possess a favorable attitude or perceived value of integrated science curriculum and feel that the integrated curriculum will fulfill program needs. They perceive that funding and equipment barriers do exist; however, educational agencies can create classroom lesson plans and labs that require minimal equipment and funding. The most hopeful aspect of this study is that the majority of the teachers have been motivated enough by their program needs and perceived values to set the goal of adopting the Biotechnology and Agriscience course.

Recommendations for Further Research

The findings of this exploratory study lead to many recommendations for future research. More descriptive research should be conducted to determine if differences exist between each independent factor and agricultural educators' intent to adopt the Biotechnology and Agriscience Research course.

A study of the relationship between agricultural educators actual knowledge of each competency and the value they place on each competency would provide more insight of the perceived value of the content of the course. The actual knowledge of agricultural educators should also be examined more closely to determine in what competency areas they are the most deficient. Graduate programs and other adult educators should carefully study and address these deficiencies and the andragogical processes needed to assist the more experienced teachers in developing self-efficacy and knowledge in these areas.

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Employer Perception of the Preparation of Agricultural and Extension Education Graduates

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Abstract

Educational reform measures have forced schools to form partnerships with business and industry to achieve common goals of a prepared workforce. These partnerships have forced colleges of agriculture to examine its mission and update the curriculum. This study sought to provide benchmark data from employers on the skills and abilities deemed important and the level of preparation of recent agricultural and extension education graduates. Additional input was sought on the life experiences that were important for entry-level positions and the areas that would impact graduates in the future. Overall, graduates were prepared for entry-level positions; however, several areas were identified where skills could be improved to match the expectations of the employers. The area of interpersonal skills was found to be the area where improvements were needed overall. The skills of teamwork, decision-making, leadership, and initiative were identified needing the greatest improvement. The access and use of the Internet was the most important computer skills while presentation skills and verbalizing needed to improve in the communications skill area. Employers rated honesty, integrity, and dependability as very important abilities

Introduction

Preparing graduates to work in a highly competitive global market is a major motivator for the fast forming partnerships between higher education and business and industry. Since the 1980s, school reform reports have called for changes that would ultimately transform the nature of education and business partnerships. Schools were graced with the need for educational reform measures that would better prepare a diverse student population for the higher order thinking and reasoning skills required in an increasingly knowledge-based, service-driven economy. Businesses were faced with the threat of an inadequately prepared work force that would jeopardize their competition with other industrialized nations. Motivated to improve the academic and technical skills of the future work force, businesses and schools joined in partnerships of various sizes and types to achieve their common and separate goals (Lankard, 1995).

The partnerships between higher education and business and industry have huge implications for agriculture. For more than a decade, employers have expressed a concern for the lack of graduates sufficiently trained to meet the challenges of a high-performance workplace. It has been proposed that the curriculum of agriculture was out of date and should be changed (Krunkel, Maw, and Skaggs, 1996). As a result, many colleges of agriculture are undergoing programmatic changes and are reexamining the philosophy underlying their missions.

A decade of studies has found various needs desired by employers. Andelt, Barrett, and Bosshamer (1997) found that employers needed employees with leadership abilities, especially in the areas of problem solving and team work which were consistent with those of Klein (1990) who found that the ability to be a team player was important for employees to possess. Other skills identified by Klein included the ability to listen and carry out instructions, read and understand specific technical information, use general business computer software, interpret and use math and statistical methods, have a positive work attitude, high ethical values, and be self motivated. Radhakrishna and Bruening (1994) found that employees and students value interpersonal, business, and communication skills. Communication skills and customer relations skills was also reported by Foster (1989). Long, Straquadine, and Campbell (1992) found that graduates value knowledge and skills in the computer sciences and oral and written communication. Marciel (1994) reported that employers look for communication skills, attendance, and appearance when hiring new employees. In addition, a number of researchers have advocated the need for practical work experience (Merritt and Hamm, 1994). Brown and Fritz (1993) found there was a grave need for better leadership preparation for today's students to succeed in the workplace. Other findings from Blezek and Dillon (1991) indicate that graduates need honesty, integrity and fairness, interest in learning, positive work ethics, willingness to work, reading comprehension, written communication, math and computation skills. According to Klein (1990), educating students for a career in agriculture and natural resources demands greater skills plus a more holistic perspective on its interaction with society.

If agricultural industries are to survive, the agriculture curriculum must be dynamic and able to adjust to new situations and environments that help to improve on-the-job effectiveness of future graduates (Coorts, 1987, Slocombe & Baugher, 1988). Although higher education has been criticized regarding the absence of industry input in the decision making process (Long, Straquadine, and Campbell, 1992), this input is increasingly important due to the rapid technological advances. Such a partnership could be used to determine if changes are needed in the curriculum and extracurricular offerings. The more that is known about competencies needed in agriculture careers and is incorporated into curriculum development, the more employable agriculture graduates will be in the marketplace. Additionally, the input from employers would provide a benchmark against which future students would be compared and serve as an assessment indicator.

Due to changes in college curricula, increased technical competencies, and changing industry, there is a need to determine the entry-level knowledge, skills and abilities required of college graduates. By incorporating the desired skills into the college curriculum, graduates will be more qualified to adapt to the high-tech, fast paced jobs of the future. Students enrolled in these programs also need reassurances that the skills and abilities they learn will be meaningful to their future employment goals.

Purpose and Objectives

The purpose of this study was to determine knowledge, skills, and abilities desired of employers of entry-level graduates of the Department of Agricultural and Extension Education. The specific objectives were to:

1. Describe the level of preparation of knowledge, skills, and abilities needed for entry-level positions of agricultural and extension education graduates.

2. Describe the level of importance of knowledge, skills, and abilities of entry-level positions for agricultural and extension education graduates.

3. Determine if difference exists in the level of preparation and the importance of the knowledge, skills and abilities of agricultural and extension education graduates.

4. Describe the perceived value of experiential education in the curriculum of agricultural and extension education.

5. Describe the major trends which will be affecting the future preparation of agricultural and extension education graduates.

Methodology

The population of this study consisted of employers of entry-level graduates from the Department of Agricultural and Extension Education (AEED) from 1996 to 1999. This list was obtained from the Department of Agricultural and Extension Education alumni records. Duplications were removed leaving 37 different employers representing public schools, government agencies, banks, and agricultural businesses. A letter was sent to each employer in the study to explain the purpose of the study. Approximately two weeks after the pre-letter, the employer survey was mailed with an accompanying cover letter from the Dean of Agricultural, Food, and Life Sciences. A postcard and second survey was mailed to all late respondents. There were 20 employer surveys used in the study for a response rate of 54.1%. No differences were found in early and late respondents. According to Miller and Smith (1983), non-respondents are assumed to be similar to late respondents.

Instrument

The survey instrument was a self-administered questionnaire adapted from other studies used at Land Grant Institutions. It was modified to include statements of skills and abilities identified in the literature important to employers. A committee composed of 10 representatives from various agricultural disciplines validated the content of the survey questions.

The questionnaire was divided into four parts:

Part one of the questionnaires consisted of six questions designed to measure the preparation and importance of knowledge, skills, and abilities of entry level employees. The employer was asked to rate the preparation of the entry-level employee on interpersonal skills, communication skills, computer skills, character traits, and technical competency. The ratings were ranked in order for preparation from 1 being unprepared to 5 being thoroughly prepared. For the same set of skills and abilities, the employer was asked to rate the importance of these same skills with 1 being unimportant to 5 being extremely important.

Part two of the questionnaire related to the importance of certain life experiences for entry level employees. The life experiences included a career related internship, career related employment, general work experience, officer of a student club, active student club member, ability to speak more than one language, and international experiences such as exchange trips. These life experiences were ranked in order from 1 being not important to 5 being extremely important.

Part three of the questionnaire was associated with the perceived growth areas in the next five to ten years that would influence this field of study. Each respondent was asked to rank the top strength or growth areas from 1 being little growth to in the area to 7 being significant growth. In addition, there were open-ended questions pertaining to the trends and issues that could impact educational training of the graduates.

For the analysis, the mean scores were calculated and responses to importance of life experiences and future trends were ranked.

Findings

Objective 1

The first objective was to describe the level of preparation of AEED graduates from on entry level knowledge, skills, and abilities that included interpersonal skills, communication skills, computer skills, character skills and technical competencies.

Regarding interpersonal skills, the employers felt that the graduates of agricultural and extension education were best prepared in the area of initiative (Mean =3.72). Graduates were rated as prepared on all of the skills in the interpersonal areas with the mean ratings clustered around the mid-point signifying prepared for entry level positions. The means of decision-making, problem-solving, organizational skills, teamwork and etiquette had a mean score of 3.56. Having creativity and global awareness were the lowest rated interpersonal skills. No employer rated AEED students as thoroughly prepared on any of the interpersonal or adaptive skills. The mean values are shown in Table 1.

Agricultural and Extension Education graduates were most prepared to understand instructions (mean = 3.89) followed by listening (mean=3.83) on communication skills. Being prepared to use the telephone effectively and verbalize their ideas received mean values of 3.59 and 3.56, respectively. The skills of AEED graduates, which were rated lower in preparation, included creative writing and presentation skills. Students were rated as somewhat unprepared in being able to speak another language with a mean score of 2.00.

Employers also rated the preparation of the entry-level computer skills. In general, employers rated AEED graduates as more prepared in word processing (Mean= 3.56) skills than other computer skills. Our graduates were rated below average in all other computer skills. Using computer aided design packages (Mean=3.21) was the skill that graduates have the least amount of preparation according to these employers.

Another component of entry-level preparation includes how well graduates exhibit a variety of character skills. As shown in Table 1, AEED graduates were rated somewhat equally on the character areas of honesty, dependability, and integrity with honesty having the highest overall mean of 4.00.

Employers were also asked to rate the level of preparation of graduates in the technical areas of the curriculum. This included areas in the biological sciences, physical sciences, humanities/arts, social sciences, mathematics, and agricultural sciences. Employers felt that graduates had good preparation in the agricultural sciences (Mean=4.00) and were prepared in all other areas. The mean score for preparation in the biological sciences was 3.71 and 3.52 in the physical sciences.

Table 1. *Employer Mean Values of the Preparation of Skills of Agricultural and Extension Education Graduates*

Interpersonal Skills	Mean	SD
Decision Making	3.56	0.70
Problem Solving	3.56	0.70
Management Skills	3.47	1.06
Organizational Skills	3.56	0.86
Leadership	3.50	1.04
Initiative	3.72	1.13
Creativity	3.44	1.04
Teamwork	3.56	1.14

Dedication	3.61	1.28
Appearance	3.61	1.14
Etiquette	3.56	0.85
Global Awareness	3.43	1.03
Open-Minded	3.56	0.98

Communication Skills	Mean	SD
Understanding Instruction	3.89	0.83
Telephone	3.59	1.00
Listening	3.83	1.61
Verbalizing	3.56	0.92
Technical Writing	3.38	0.85
Creative Writing	3.22	0.87
Presentation Skills	3.39	0.84
Second Language	2.00	0.91

Computer Skills	Mean	SD
Word Processing	3.56	0.70
Spreadsheets	3.31	0.60
Database	3.25	0.57
CAD	3.13	0.54
Graphics	3.25	0.58
Accounting systems	3.21	0.94
Internet access & use	3.35	0.63

Character Skills	Mean	SD
Honesty	4.00	0.91
Dependability	3.89	1.07
Integrity	3.89	0.96

Technical Competency	Mean	SD
Physical Sciences	3.52	0.71
Biological Sciences	3.71	0.59
Humanities	3.06	0.82
Social Sciences	3.29	0.92
Mathematics	3.41	0.93
Agricultural Sciences	4.00	1.02

Scale: 5=Thoroughly prepared; 4=Good preparation; 3=Prepared; 2=Somewhat prepared; 1=Unprepared

Objective 2

The second objective was to describe the level of importance of the basic work-place knowledge, skills and abilities for entry-level jobs. While it is important to know how prepared AEED graduates are to enter the work place, it is equally as important to know which skills are considered as the most important skills for the entry-level positions.

As show in Table 2, the skills of leadership, teamwork and dedication (Mean=4.56) were equally rated as very important interpersonal skills. Decision-making and problem solving were also highly rated with mean values of 4.38 and 4.39, respectively. All but two of the interpersonal skills were rated as very important.

Listening (Mean= 4.50) was rated as the most important communication skill by the employers. Understanding instruction and verbalizing were also rated as very important communication skills (Mean =4.44) along with presentation skills (Mean =4.11).

Word processing (Mean= 3.72) and internet skills (Mean =3.71) were the most important computer skills needed by graduates according to the employers in this study. All computer skills were rated as important for AEED graduates.

Employers value all of the character skills for entry-level employees. Honesty, dependable, and having integrity were all rated as highly desirable and important traits. All received the same mean importance value of 4.72.

Agricultural sciences (Mean =4.41) was the most important technical competency rated as very important by the employers for AEED graduates. Employers rated all of the other technical subject areas as important with mathematics being the next most important technical area of competency. Biological sciences and physical sciences, social sciences and humanities followed this.

Table 2. *Employer Mean Ratings of Importance for Skills for Graduates for Entry Level Positions*

Interpersonal Skills	Mean	SD
Decision Making	4.38	0.69
Problem Solving	4.39	0.50
Management Skills	4.00	0.76
Organizational Skills	4.28	0.46
Leadership	4.56	1.13
Initiative	4.39	0.50
Creativity	3.89	0.67
Teamwork	4.56	0.61
Dedication	4.56	1.28
Appearance	4.23	0.56
Etiquette	4.11	0.69
Global Awareness	3.56	0.86

Open-Minded	4.22	0.73

Communication Skills	Mean	SD
Understanding Instruction	4.44	0.51
Telephone	3.58	1.00
Listening	4.50	1.29
Verbalizing	4.44	0.61
Technical Writing	3.67	0.90
Creative Writing	3.35	0.93
Presentation Skills	4.11	0.76
Second Language	2.43	1.22

Computer Skills	Mean	SD
Word Processing	3.72	0.46
Spreadsheets	3.43	0.62
Database	3.43	0.63
CAD	3.12	0.95
Graphics	3.27	0.96
Accounting	3.20	0.94
Internet	3.71	0.61

Character Traits	Mean	SD
Honesty	4.72	0.46
Dependability	4.72	0.46
Integrity	4.72	0.46

Technical Competency	Mean	SD
Physical Sciences	3.63	0.71
Biological Sciences	3.71	0.58
Humanities	3.25	0.85
Social Sciences	3.31	0.87
Mathematics	3.94	0.44
Agricultural Sciences	4.41	0.71

Scale: 5=Extremely Important; 4=Very Important; 3=Important; 2=Somewhat important; 1=Unimportant

Objective 3

The third objective was to determine the differences of the level of preparation and the importance of the knowledge, skills and abilities of AEED graduates for entry-level positions. The mean of the difference between the response for preparation and the response for importance was computed. All mean values for preparation were lower than the mean of importance of each variable. The skill of teamwork was rated with the greatest difference of 1.00. With the exception of global awareness and creativity, all other skills ranked had a mean difference of .50 or greater. These values are shown in figure 1.

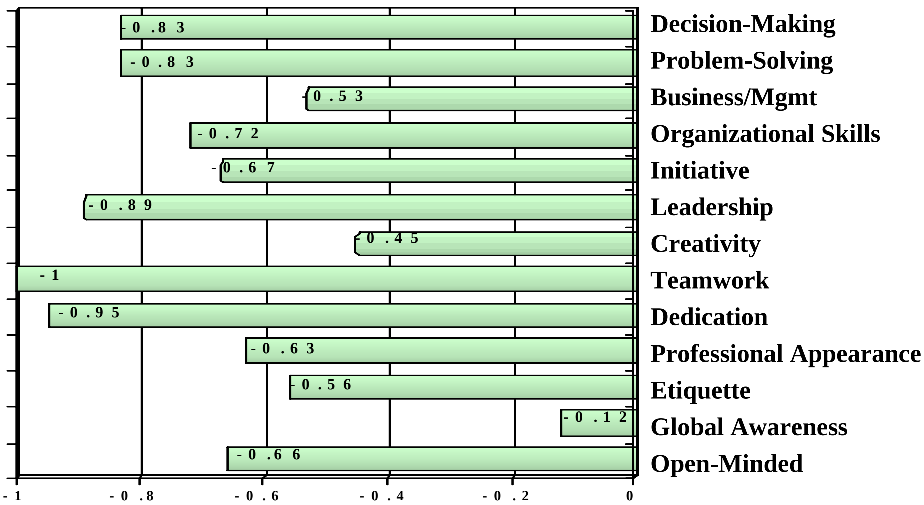

Figure 1*: Mean of the Differences of Preparation and Importance of Interpersonal Skills*

Communication skill mean differences are shown in figure 2. Verbalizing, presentation skills, listening, and understanding instructions were communication skills perceived by employers to be very important. All of the AEED graduates were rated lower for their preparation on these skills than the importance of the skill rating by the employer.

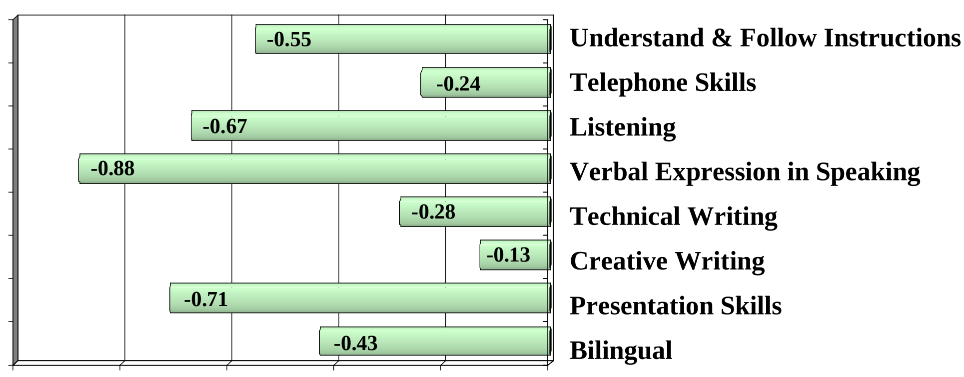

Figure 2. *Mean of the Differences of Preparation and Importance of Communication Skills*

The greatest difference of preparation and importance on computer skills was the ability to access and use the Internet. Overall, these differences were less than other skills noted by the employers. There were two skills, computer aided design and computerized accounting systems, which the importance of the skill was rated less important than the preparation level of the entry-level graduate.

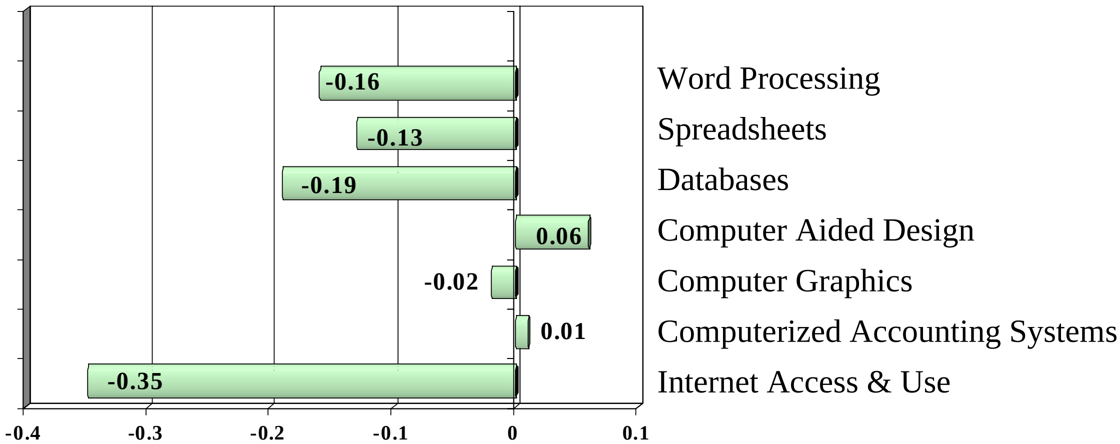

Figure 3: *Mean Differences of Preparation and Importance of Computer Skills*

Character traits were the highest of all of the skills or abilities by employers with all rated as very important. While our students were rated highly, employers placed a very high value on integrity and dependability.

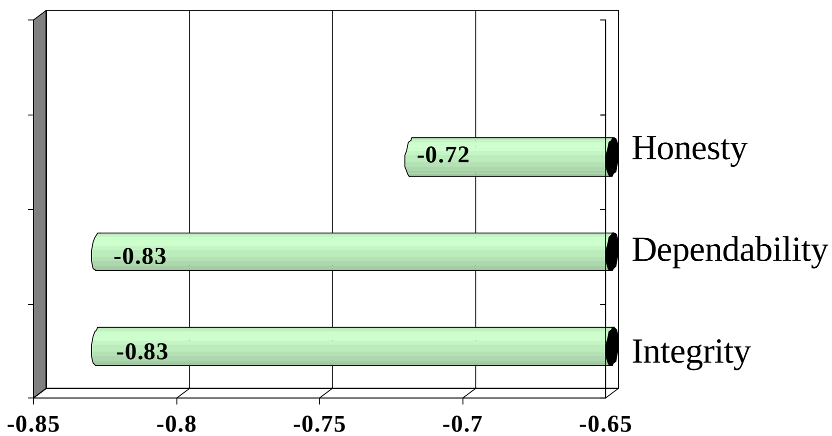

Figure 4: *Mean Differences of Preparation and Importance of Character Traits.*

The mean differences were greatest for mathematics and the agricultural sciences when preparation and importance was compared. Slight differences were found in social sciences, and physical sciences with no difference of mean scores in the biological science area as shown in Figure 5.

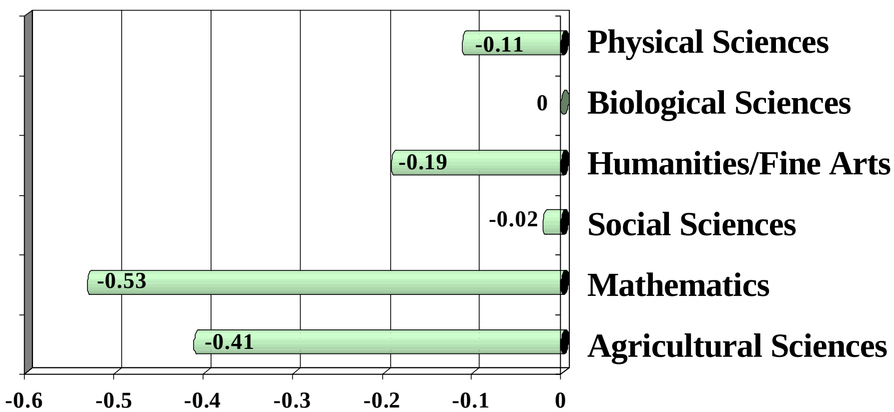

Figure 5: *Mean Differences of Preparation and Importance of Technical Competencies.*

<u>Objective 4</u>

Employers were also asked to rate a series of life experiences that they felt were important for success on the job for AEED graduates. These employers rated having general work experience as the most important experience (Mean =3.75) followed by having work experience on a farm (Mean=3.44) and being reared on a farm (Mean=3.11). All mean scores are shown in Table 3.

Table 3. *Mean ratings of life experiences important for entry level agricultural and extension education graduates*

Life Experience	Mean	S. D.	Rank Order
Reared on a farm	3.11	0.78	4
Work experiences on a farm	3.44	0.53	2
Agricultural internships	2.89	0.93	6
Agricultural employment	3.22	0.97	3
General work experience	3.75	0.71	1
Officer of a student club	3.00	0.76	5
Active student club member	2.89	0.93	7
Bilingual	2.43	1.39	8
International experience such as Exchange trips	2.50	0.93	9

Scale: 1=not important; 2=somewhat important; 3=important; 4=very important; 5=extremely important

Objective 5

These employers ranked future growth areas that would impact or change agriculture for the next 5-10 years. The mean scores of these growth areas are listed in Table 4. The employers rated computer systems (Mean =5.86) and research and development (Mean=5.75) as the most likely areas to influence agriculture in the next 5-10 years. Technical consulting, environmental issues and quality control were also rated as strong growth areas with mean scores of 5.63.

Table 4. *Growth areas which may impact agricultural and extension education graduates in the future*

Growth Areas	Mean	S. D.	Rank Order
Sales	4.75	1.03	9
Management	5.13	0.99	8
Environment	5.63	0.52	3
Quality Control	5.63	0.52	3
Mechanical	4.71	0.76	11
Marketing	5.63	0.91	3
Research and Development	5.75	0.88	2
Consumer Relations	5.63	0.74	3
Computer Systems	5.86	0.69	1
Education and Training	5.43	0.79	6
Communication	5.43	0.97	6
International Agriculture	4.86	1.46	10

Conclusions and Recommendations

In general, our students are prepared to enter into entry-level positions. Only the skill or ability to speak a second language was rated as unprepared by the employers of AEED graduates. However, when compared to the level of importance placed on the interpersonal skills and abilities, it appears that our students need to improve in the area of professionalism. Our graduates need to demonstrate the ability to work in groups, show leadership, dedication, and initiation more than they are now doing. It may also be that graduates exhibit "on-the-job awkwardness." These perceptions may simply be a lack of maturity or business savvy that all graduates have without a few years of on the job training. AEED students are proficient in computer skills, except the use of the Internet. CAD and accounting systems were rated as the least area of preparation. With the increased impact of the Internet, these skills will have a more immediate impact of need than some of the other computer skills. In the communication skill area, employers rated verbal expression, presentation skills, listening, and understanding instructions as very important. All character traits were very important to the employers.

Employers felt that having general work experience was an influencing factors for success for entry-level employees. They also felt having experiences in an agricultural work area and being raised on a farm were important for AEED graduates. Computer systems, research and development, the environment and quality control areas were rated as impact areas influencing the future of AEED graduates.

Based on these findings, it is recommended that the department examine the following changes in the curriculum to minimize the differences of the level of preparation and importance of each of these skill areas:

1. Explore the adoption of senior projects, colloquia, or other avenues to acquire skills in communication, problem solving, and decision-making.

2. Require more writing and presentation as part of the total degree program.

3. Incorporate more "hands-on" teaching in the class room. If agriculture is truly an applied science, then our students must be given the opportunity to apply the science they have learned in their course work. The employers have indicated our students are book smart, however, they lack the skills of a professional that comes from exposure to real situations.

4. Incorporate the use of computer skills with more course assignments.

5. Organize an advisory committee to seek on-going input into the curriculum.

6. Continue to administer employer and alumni studies for feedback.

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Agricultural Societies as Antecedents of the FFA

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Abstract

This research focused on the predecessors of the FFA by outlining the history and purposes of agricultural organizations formed since the late 1700s. The major conclusion of the study was that the past two centuries of American agricultural history is rich with efforts to educate and improve agricultural practices through organized groups of farmers and other rural leaders. Early in the development of agricultural societies, experimentation and successful practices were shared with others in the local organization and works were often published in journals or newspapers for educational and informational purposes. Regular meetings and fellowship was also a major focus of the early groups. The national organizations that formed later such as the Grange, included the fraternal, social, and educational aspects while maintaining a focus on the economics of farming.

The boys' and girls' club movement provided opportunities for youth to meet, learn, and participate in agricultural competitions. The center of activities for youth organizations quickly shifted from community groups to agricultural education programs in the public schools. Clubs that formed within agricultural education programs in Virginia soon united to create the Future Farmers of Virginia. The FFV and FFA that followed initiated the use of certain symbols, colors, and ritual ceremonies that can be traced directly to the agricultural societies. This research identified many agricultural societies and youth clubs that had a profound influence on the development of the National FFA Organization.

Introduction

There are many interesting and unique aspects to the FFA. These include degrees of membership, a creed, opening ceremonies, the unique office of sentinel, and official colors. Leaders of the FFA had to create all of these unique features for an organization that, at the national level, has been in existence since 1928. Many different influences may well have gone into influencing those leaders. Where did that influence come from?

Rural sociologists have long recognized the need of basically isolated farm people to establish organizations for the social aspect of interacting with each other. In many instances, the same organizations have been used for additional purposes. Among these purposes have been the establishment of cooperatives, the creation of economic clout through larger numbers, and the support of education. Educational support and activity came in the form of lobbying efforts, informal meetings for adult members, and the establishment of fairs.

Agricultural societies were some of the most prominent of the primarily rural organizations. It is the purpose of this project to determine the source of many of the unique aspects of the FFA, including a determination of the role played by agricultural societies in creating those unique and long-standing features.

Conceptual Framework

Long before the FFA was started there existed literally hundreds of agricultural societies in the United States. By 1867 it was estimated that over 900 such societies were flourishing (Nordin, 1974). Several such societies were in existence in the1700s. The activities these societies supported show a lineage that can be traced to the founding of the FFA. Causes supported by the societies varied from social to agricultural to educational.

Many famous Americans such as Benjamin Franklin, George Washington, James Madison, and Thomas Jefferson were members of agricultural societies. Franklin and Washington belonged to the Philadelphia Society for the Promotion of Agriculture. Madison and Jefferson were members of the Albemarle Agricultural Society.

The agricultural societies were located all over what was then the continental United States. Only the country's boundaries limited their existence. They were located in rural as well as urban areas. The causes, as well as the educational activities, they supported were both informal and formal. They were as informal as simply serving as discussion groups where gardens and home farm problems were the topics. They were as formal as performing rituals in the form of a fraternal organization, lobbying on behalf of public education, and sponsoring fairs.

In different ways the agricultural societies provided a lineage to the FFA. It is true that everything has an antecedent. For the FFA the principal antecedent was the numerous agricultural societies.

Purpose and Objectives of the Study

The basic purpose of the study was to determine several influential agricultural societies on the development of the FFA. The specific objectives of the study were as follows:

1. To identify prominent agricultural societies in the United States from the 1700s to the period just before the founding of the FFA.

2. To determine the objectives of prominent agricultural societies in the United States during the same time period.

3. To determine agricultural societies influence on the FFA.

Research Procedures

Historical research methodology was utilized to accomplish the objectives of the study. Both primary and secondary sources were used to obtain the information needed. Primary sources included journal articles, minutes of meetings, newsletters, bulletins, a constitution, and books. Secondary sources included magazine articles, proceedings, and books. Information was collected at numerous sites including the Library of Congress, National Education Library, the National Agriculture Library, and various land-grant universities and state libraries. All references were subjected to both internal and external criticism, which tests for accuracy of materials and to determine if the material examined was authentic.

Findings

There were literally hundreds of agricultural societies established. It is virtually impossible to identify them all as some only lasted a short period of time and had no records surviving them. It is also difficult to identify only the most important. What becomes the criteria for important? Is it the largest? Is it the most politically potent? Or is it only the ones who survived for many years and have abundant records? The societies described are ones that have records available, are meant to be representative of the hundreds of societies established, and some have a direct or indirect lineage to the FFA. The first to be described is a national organization called the United State Agricultural Society, which was influential in giving agricultural education departments an administrative home.

United States Agricultural Society

The United States Agricultural Society was formed in 1852 at a convention called by 12 state agricultural societies (True, 1929) with the general purpose of

> … to embody in one central Association, the valuable information already obtained by various local Societies, and to establish a more intimate connection between them; to correspond with foreign Societies, and to diffuse a knowledge of their most important Agricultural improvements and discoveries; and, in various other ways, to aid the promotion of this noble art. (Wilder, 1853, p. 159).

At its very first meeting in 1852 the United States Agricultural Society discussed encouraging the establishment of a Department of Agriculture as a Cabinet level agency. It took several years of meetings and the passage of many resolutions before President Lincoln signed the legislation establishing the United States Department of Agriculture (Proceedings, 1880).

From its earliest meetings the United States Agricultural Society endorsed educational programs for agriculture. This endorsement was especially true for higher education. At the 1856 annual meeting in Washington, DC the Society passed a resolution endorsing the same resolution passed by the Illinois General Assembly supporting the "Encouragement of Practical and General Education among the People." (King, W. S., 1856, p. 22) The resolution went on to specifically endorse the industrial university and the granting of land to establish such universities.

The early and successful support of the United States Agricultural Society for both the United States Department of Agriculture and the Land-Grant Act gave both agriculture and education a significant boost. The Department of Agriculture would provide a great deal of assistance to agricultural education teachers before passage of the Smith-Hughes Act and Land-Grant universities would provide a departmental home for numerous departments of agricultural education.

In addition to educational and lobbying efforts the United Sates Agricultural Society recorded the existence of state and local agricultural societies. It recorded 941 such societies in 1860 (True, 1929, p. 23).

Philadelphia Society

The Philadelphia Society for Promoting Agriculture was started March 15, 1785 (Minutes of the Philadelphia Society, 1854). As an organization it had been preceded by the American Philosophical Society, which was founded in 1744 (True, 1929). According to the laws of the organization:

> The Society's attention shall be confined to *Agriculture and Rural affairs:* especially for promoting a greater increase of the products of land within the American states.
>
> The Society shall annually propose *Prizes*, upon interesting subjects relative to actual experiments and improvements, -and for the best pieces written on proposed subscriptions. All claims of prizes shall be sent in writing, and when read, the Society shall determine upon every prize, which of the claims are most worthy to be selected for the definitive judgement on a future comparison of them.
>
> This Society shall promote the *establishment of other Societies,* or offices of correspondence, in the principal places in the country. The friends of Agriculture shall be invited to assist us with information of experimental and incidents in husbandry. The members of those Societies shall be requested to attend our meetings as often as they come to Philadelphia.

> *Premiums and Prizes* are equally due to persons residing in any of these states, according to the merit of their respective exhibitions. (Minutes of the Philadelphia Society, 1854, pp. 2-4)

The Society encouraged such approved practices as using oxen instead of horses, recovering gullied and worn out fields and to establish timber in fields too worn out for tillage, and to encourage the use of hedge-rows (Minutes of the Philadelphia Society, 1854). In 1785 a prize was established "For the best experiment made of a course of crops, either large or small on not less than four acres, agreeably to the principles of the English mode of farming" (Minutes of the Philadelphia Society, 1854).

South Carolina Societies

On August 24, 1785 the South Carolina Society for Promoting and Improving Agriculture and Other Rural concerns was founded in Charleston. Some 10 years later its name was changed to the Agricultural Society of South Carolina (True, 1929).

The Pendleton Farmers' Society was founded in 1815 (Pendleton Farmers Society, 1908). Pendleton, South Carolina is just a few miles from Clemson. By 1819 the Society's purpose was reported.

> The great object of this Society is the agricultural improvement of the district, by directing the attention of their brother farmers to the various branches of rural economy, and by the introduction of the most modern and approved system of husbandry; and surely it is obvious to all, that such improvement is necessary to our welfare and prosperity. We are the largest, and it is believed, the most populous district in the State; but our importance is reduced by a want of information on many essential points, and particularly on agricultural subjects.
>
> To promote these praiseworthy objects, to increase the real comfort and happiness of every farmer in the district, and to make him respectable and independent, the Farmers' Society was instituted.
>
> The Society know that practical farmers are not literary men; the style or manner of communication is perfectly immaterial; and the Society, as a body of plain farmers themselves, want plain facts in plain language. (Pendleton Farmers' Society, 1908, pp. 203-205)

Several educational points of discussion were posed by the Society concerning the topic of agriculture. The questions revolved around the topics of manure, soils, tillage, stock, grasses, fruit trees, vermin, and bees (Pendleton Farmers' Society, 1908).

Some of the prominent members of the Pendleton Farmers' Society were John C. Calhoun and Thomas Clemson. The Society recognized outstanding crop production. In 1887 the champion corn producer for one acre was Z. Y. Drake of Marlboro County, South Carolina with 255 ¼ bushels, in 1906 it was J. A. Tindal of Clarendon County, South Carolina with 182 bushels. Both Drake and Tindal were rewarded with honorary membership in the Society (Pendleton Farmers' Society, 1908, p. 88).

Farmers' Union

On August 28, 1902 an application was made for chartering the Farmers' Educational and Co-operative Union of America in Rains County, Texas. The first local Union was founded in the Smyrna Schoolhouse September 2, 1902. The Farmers' Union constitution indicated its purpose was to aid member Unions in marketing and obtaining better prices for their products (Barrett, 1909).

The Preamble of the organization stated its overall specific, but rather diverse, purposes and objectives.

> To enable farmers to meet these conditions and protect their interests, we have organized the Farmers' Educational and Cooperative Union of America, and declare the following purposes:
>
> To establish justice
> To secure equity
> To apply the Golden Rule
> To discourage the credit and mortgage system
> To assist our members in buying and selling
> To educate the agricultural class in scientific farming
> To teach farmers the classification of crops, domestic economy, and the process of marketing
> To systematize methods of production and distribution
> To eliminate gambling in farm products by Boards of Trade, Cotton Exchanges, and other speculators
> To bring farmers up to the standard of other industries and business enterprises
> To secure and maintain profitable and uniform prices for grain, cotton, live stock, and other products of the farm
> To strive for harmony and good will among all mankind and brotherly love among ourselves
> To garner the tears of the distressed, the blood of martyrs, the laugh of innocent childhood, the sweat of honest labor and the virtue of a happy home as the brightest jewels known. (Barrett, 1909, p. 107)

Boys' and Girls' Clubs

Many early youth organizations centered around specific commodities such as wheat, pigs, poultry, and others. The most popular of these appeared to be corn. One reason for this popularity could have been the corn exhibit at the 1904 World's Fair in St. Louis. It was something of a national sensation as it was composed of "pyramids made up of 1,000 little pyramids, each containing 10 beautiful ears of white or yellow corn, straight-rowed, symmetrical, uniform." (Crosby, 1904, p. 489) The exhibit and the publicity surrounding it helped inspire corn clubs in several states. The states included Illinois, Iowa, Ohio, Texas, New York, and Indiana (Crosby, 1904).

Edwin Osgood Grover wrote a forerunner to the FFA Creed which was dedicated to the Boy's Corn Clubs of Virginia. It was called the Country Boy's Creed and started with the sentence "I believe that the Country which God made is more beautiful than the City which man made; that life out-of-doors and in touch with the earth is the natural life of man." (The Country Boy's Creed)

Stuart (1913) reported that potato growing was a good club work activity in North and West states. He recommended a one-eighth plot of land for 10 to 18 year old children.

True (1929) reported 20 institutions for the period of 1905-1910 had established an extension division or department. He further reported that boys' and girls' club work was one of the most important areas of work for the extension administrative units.

<u>National Grange</u>

The Patrons of Husbandry, more commonly known as the National Grange, was started in 1867 (Nordin, 1974). The man who played a prominent role in its establishment was Oliver Hudson Kelly, informally called the "Father of the Grange." Kelly was an employee of the United State Department of Agriculture, who had the responsibility of documenting the agricultural situation in the United States shortly after the end of the Civil War (Nordin, 1974; Patrons of Husbandry, 1992). What Kelly observed convinced him that farmers, both males and females, needed to organize and use some measures of collective bargaining. Similar to Masons, the Grange had various degrees of membership and used ritual at meetings (Nordin, 1974).

In the South, where Kelly had observed great suffering on the part of Antebellum farmers, it was the small white farmer who was the driving force behind the Grange's establishment. In fact, the Grange was the first general farmer's organization that was established in the South after the Civil War, where it started in 1870 (Saloutos, 1960).

Kelly's original idea was to establish both an educational and fraternal organization; however, he quickly learned what farmers wanted was more of an economically based organization. By 1875 the Grange had succeeded in enrolling 761, 263 members in 45 states including the District of Columbia plus Canada (Nordin, 1974).

Grangers were concerned with both informal and formal education as evidenced by a statement in the Declaration of Purposes from 1874 "We shall advance the cause of education among ourselves, and for our children, by all just means within our power." Informal education was encouraged by the reading of newspapers. In fact, the Grange encouraged the reading of certain newspapers and some Granges had a literary hour following meetings. In addition, larger Granges had their own libraries for their members' use (Saloutos, 1974).

On the formal side of education, the Grange strongly advocated education from the elementary level through higher education. As the Texas State Master said in 1862, "... nothing increases debt, vice, superstition, and crime so much as ignorance." (Nordin, 1974). They supported both private and public education. The overall one common theme was practical application of what was taught.

On the private side, Granger schools were opened in North Carolina, Louisiana, Mississippi, and Alabama. On the public side, Grangers worked at the local, state, and national levels for better schools. Grangers are credited with helping with the founding of Mississippi State University (Nordin, 1974; Saloutos, 1960). Grangers were supportive of vocational education, especially agricultural education (Howard, 1992).

The National Grange directly influenced certain parts of the early development of the Future Farmers of Virginia.

Henry C. Groseclose, a Virginia agricultural education leader and an active seventh-degree Grange member, was asked to develop a ritual and procedures for the new clubs. He utilized some Grange tools and the familiar Grange blue and gold colors. The ritual Groseclose wrote was adopted in 1926 in Virginia and two years later, at the formation of the national Future Farmers of America organization, it was accepted for use by all clubs in the country. (Howard, 1992, p. 138)

There are several common factors between the Grange and the FFA. Both organizations emblems have had a plow. Both organizations have used an owl. For the Grange the owl means watchful. For the FFA the owl means wise. The Grange and the FFA have used creeds that begin each paragraph with the words I believe. For example a creed used by the Grange has one paragraph that starts with the sentence "I believe in the goodness of rural life; I will do what I can do to make it still better." (Creed of a Grange Lecturer, 1930, p. 7) Both organizations have been influenced by the Masonic ritualistic ceremony of opening meetings by a poll of officers reciting duties. All three organizations have an officer who guards the meeting room door. For the Masons the officer is called the tiler, for the Grange the officer is called the gatekeeper, and for the FFA the officer is called the sentinel.

Virginia Societies

There were numerous agricultural societies in Virginia. One library reference listed over 100 (Brown, 1937). Two of the most prominent of those listed were the Albemarle Agricultural Society and the First Families of Virginia.

Albemarle Agricultural Society.

The Society was formed in 1817 (Objects, 1817). Former President, Thomas Jefferson, is credited with starting the Society (Cartensen, 1960) and suggesting numerous topics that could be covered at meetings of the organization.

> 1st and principally the cultivation of our primary staples of wheat, tobacco, & hemp for market. . . . .The care and services of useful animals for the saddle or draught, for food or clothing, and the destruction of noxious quadrupeds, fowls, insects, and reptiles. Rotations of crops, and the circumstances which should govern or vary them according to the varieties of soil, climate & markets of our different counties. . . . . (Jefferson, 1817, p. 1).

By October 14, 1817 immediate past President of the United States (since March of the same year) James Madison, was elected the first president of the Albemarle Agricultural Society (Randolph, 1817). The Society lasted until 1848.

First Families of Virginia (FFV).

The First Families of Virginia or FFV was both a formal and informal, but aristocracy based society. The formal FFV membership was only open to lineal descendents of ancestors who aided in the establishment of the Jamestown Colony in Virginia from 1607-1624 (Hereditary Register, 1973). In the colonies, as in England the key to social eminence was holding land. During colonial times the ". . . Governor looked to a few leading landholding families to preserve the peace and the status quo." (Rouse, 1968, p. 45) Rouse went on to describe such prominent citizens as the first families of colonial Virginia.

Closely affiliated with the prominence of the FFV was the term planter. The term planter was used as early as 1624 when Jamestown adventurers were referred to as planters (Meyer & Dorman, 1987). Rouse (1968) reported "The term 'esquire' was used after the name of a man of highest rank. Gentlemen were addressed as 'Mr.,' for 'Master.' The term 'planter' by the year 1700 had come to denote social rank and was interchangeable with 'gentlemen.'" (p. 45)

The more informal meaning of FFV gradually evolved to where non-Jamestown descendants would be considered as members. Basically, the term FFV came to mean aristocrat or eminent. Lineage to Jamestown nor formal votes were used as criteria. With the new informal meaning both George Washington and Thomas Jefferson were considered to be members of the FFV (Farrar, 1956). The term planter has also been associated with both Washington and Jefferson.

Future Farmers of Virginia (FFV)

The Future Farmers of Virginia, or the FFV, got its start in September of 1925 (Noblin, 1942) when four agricultural teacher educators at Virginia Tech sat around an oak table and discussed the need to establish a youth organization that would help give the rural students studying vocational agriculture more pride in themselves. The easy part was agreeing that such an organization should be established; the hard part was working out the details. Henry Groseclose worked on most of the details.

In the FFV Constitution written by Groseclose and later adopted by the Vocational Agriculture teachers in Virginia, it is pointed out that Washington and Jefferson serve as a model for the Future Farmers of Virginia. “ The Future Farmers of America should follow the example of these great sons of early Virginia by using scientific knowledge, intelligence and enthusiasm to the end that agriculture may again be known as the profession of the real aristocracy.” (Groseclose, 1926, p. 2)

The three degrees of membership Groseclose (1926) described were Green Hand, Virginia Farmer, and Virginia Planter. The opening ceremony ritual also written by Groseclose showed a great deal of influence from both the Masons and the National Grange with a similar roll call of officers and a unique officer guarding the meeting room door. For the Masons it is the tyler, for the Grange it is the gatekeeper, and for the FFA it is the sentinel.

Discussion

The implications for the study can be conceptualized by using the constant comparative method in analyzing the past 200 years of agricultural history in the United States. Just as the FFA formed as an educational organization for youth enrolled in vocational agriculture classes, early agricultural societies developed as a way for farmers, or others interested in farming and rural life, to improve agricultural production as well as conserve the land.

Many agricultural societies conducted fairs and exhibitions while offering prizes for agricultural implements, crop displays, and the showing of livestock. The societies also often conducted annual contests for the greatest production of certain crops on a set amount of acreage, improvements in animal husbandry, agricultural experiments, and written works on proposed subjects. These competitions can easily be related to the present Proficiency Award Program, Agriscience Recognition, and essay events sponsored by the National FFA Organization.

Youth clubs that formed in the early 1900s placed most of their emphasis, in fact, on the annual growing contest. Many clubs sponsored competitions for the most or best corn grown in a certain area of ground under specific rules. Of course, the crop depended on the type of agriculture in the region. By 1910, the U. S. Department of Agriculture even supplied a recommended format for record keeping and applying for the award.

Numerous teachers of agriculture formed boys’ clubs or similar organizations to increase the efficiency of their instruction and to offer incentives for their students’ accomplishments. Henry Groseclose, Harry Sanders, and Walter Newman, three of the four founding members of the Future Farmers of Virginia, all organized clubs while teaching high school agriculture in the early 1920s. As teacher educators, they along with Edmund Magill, developed the concept for the FFV.

This research concluded that previous agricultural societies and youth clubs played a role in the development of the FFV and FFA. The similarities include purposes, officers, ceremonies, degrees of membership, and competitions that prior organizations had endorsed.

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Quality of Life of Scholarship Recipients

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Introduction and Theoretical Framework

Each year colleges, universities, corporations, and private organizations award scholarships recognizing students who demonstrate outstanding academic achievement, leadership ability, a commitment of service to others, exceptional talents, and involvement in extracurricular activities. Some scholarships provide important incentives for young people to pursue their careers and interests while others encourage student enrollment in particular majors or specific career fields.

In 1957, the Houston Livestock Show and Rodeo (HLS&R) presented its first educational scholarship. Now, more than 40 years later, the mission of the HLS&R is still defined by the hundreds of youngsters who annually receive financial support from the organization (Houston Livestock Show & Rodeo, 1997). In September 1998, HLS&R officials announced an increase of $2.25 million in their annual commitment to Texas youth and education, reaching a total of $7,725,000 for 1999 scholarship recipients (Houston Livestock Show & Rodeo, 1998).

The Agricultural Consortium of Texas (thirteen universities that award bachelor's degrees in agriculture) proposed to the HLS&R to conduct an evaluation of the HLS&R Scholarship Program by studying the effect of scholarships on recipient's careers, communities, and quality of life (QOL), thus resulting in this research.

The guiding theoretical framework for "quality of life" in the context of this research was defined as an overall general well-being comprised of both objective and subjective evaluations of physical, material, social, and emotional well-being, together with the degree to which individuals enjoy the important possibilities of their lives, or how good is your life for you? (Renwick & Brown, 1996). Significant to these evaluations is the relative importance an individual places on each area (Felce & Perry, 1996). Two seminal studies conducted during the 1970s, which are often quoted in QOL literature are Campbell, Converse, and Rodgers (1976) and Andrews and Withey (1976). Campbell, Converse, and Rodgers (1976) disclosed that a sense of well-being is more dependent on an individual's satisfaction with resources than on the quality of these resources. Andrews and Withey (1976) concluded that QOL is determined by an individual's perceptions of well-being based on evaluation of life domains such as family, residence, job, friends, neighbors, and health, and evaluations of criteria such as standards, aspirations, values, and goals.

The framework for this research focuses on an individual’s possibilities in three fundamental areas of life common to all human beings, which are essential dimensions of human experience. These three life domains are being, belonging, and becoming (Figure 1) (Raphael, Renwick, Brown, & Rootman, 1994). Being reflects who one is as an individual. Belonging refers to the ties individuals have with their physical environment. The third domain, becoming, focuses on purposeful activity in which individuals engage in an attempt to accomplish goals, aspirations, and hopes (Raphael, et al., 1994).

Literature on QOL issues indicates that level of educational attainment, level of income, and level of involvement in voluntary associations and church-related associations are positively related to QOL. A positive correlation with QOL implies that a factor measures or indicates happiness and satisfaction (Heylighten & Bernheim, 1998). Also, indications are gender has little or no correlation to QOL. In addition, a review of literature indicates that residence in large communities (quantified as size) is negatively related to overall QOL. Finally, some evidence suggests that individuals who are employed in the area in which they were educated are happier than those who are subsequently employed outside of their area of study.

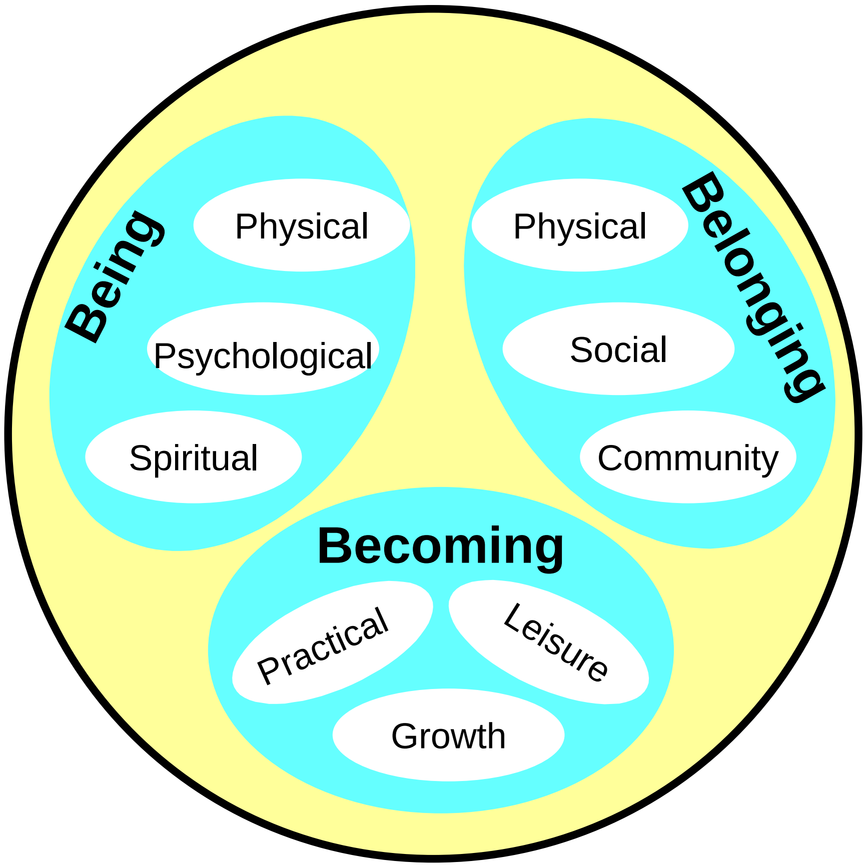

Figure 1. *Fundamental life domains and subdomains common to all human beings (Raphael, Renwick, Brown, & Rootman, 1994).*

Guiding Principles

The following assumptions were used as guiding principles for this study:

1. The concept of quality of life applies to all human beings.
2. The quality of life of an individual is subject to change.
3. Quality of life is holistic, therefore considering all aspects of an individual's life--physical, psychological, social, and spiritual.
4. Components of quality of life, those things constituting our human condition, are common for all individuals.
5. Quality of life considers the interaction between the individual and the environment of the individual.
6. Quality of life is a product of both objective conditions and subjective evaluations persons impose on their current circumstances.
7. The perspective of the individual is emphasized as a measure of studying quality of life.

Purpose of the Study

The purpose of this study was to determine whether significant relationships existed between proposed variables and QOL as perceived by scholarship recipients. Proposed variables selected, based on preponderance of the review of literature, included education, income, involvement in voluntary organizations and religious associations, gender, and residence. Another purpose was to describe the overall QOL of individuals as perceived by the survey participants. This study further investigated whether significant differences existed in the QOL between graduates of an area of study subsequently employed in their area of study versus graduates employed in areas outside their area of study.

Method and Procedures

A correlation design was used in this study. The instrument used to collect data for this study consisted of two sections. The first section provides descriptive personal, education, employment, and scholarship data. The second section consisted of the Quality of Life Profile, (QOLP), a generic measure of health and well-being developed by a multidisciplinary research team from the Quality of Life Research Unit at the Centre for Health Promotion (CHP), University of Toronto, (Renwick & Brown, 1996).

Development and validation of the QOLP was done by the Quality of Life Research Unit at the University of Toronto over a five-year period. The QOLP consists of 54 items, six in each of the nine sub-domains. Respondents provide Importance ratings along a five-point Likert response scale for each of the 54 items. This process is repeated for Satisfaction ratings for each of the 54 items. QOL scores were computed using importance and satisfaction scores for each of the 54 aspects of life. QOL scores are computed as follows: [QOL=(importance score / 3) * (satisfaction score - 3)] with QOL scores ranging from -3.33 (not at all satisfied with extremely important issues) to 3.33 (extremely satisfied with very important issues) (Raphael, D'Amico et al., 1996).

QOL scores above 0 reflect a positive QOL, while those below 0 reflect a negative QOL. Overall QOL scores greater than1.50 are considered excellent scores. Scores from .51 to 1.50 indicate a very acceptable QOL situation. Scores from -.50 to .50 indicate an adequate QOL situation. Scores of -. 51 to -1.50 indicate problematic QOL, while scores less than -1.50 are very problematic (Quality of Life Research Unit, 1998).

Psychometric evaluation of the QOLP was conducted by the Quality of Life Research Unit as well. Cronbach's internal consistency coefficients were calculated for Importance, Satisfaction, and QOL scores within each domain and sub-domain. For Importance, all domain and sub-domain scores exceeded .70, except for Spiritual Being (.68) and Community Belonging (.62). For Satisfaction, all coefficients exceeded .70 with all but two being >.80 (Raphael, D'Amico, Brown, & Renwick, 1996).

The population frame for this study was assembled from names and addresses of all scholarship recipients who were awarded direct scholarships by the HLS&R beginning in 1957 and continuing through 1997. The researcher received from the HLS&R a database of names and addresses of 4,283 scholarship recipients. The restriction imposed by addresses identified over a forty-year period resulted in an accessible population of 3,839 scholarship recipients. The total number of surveys received was 1,512, representing 39.4% of the accessible population. Research has indicated that late respondents are similar to non-respondents (Miller & Smith, 1983). So, to determine if the responding sample was likely to have been representative of the total population, "days to respond" was correlated with primary variables of interest in this study. "Days to respond" was positively correlated with age ($\underline{r}$ = .15), salary ($\underline{r}$ = .12), and educational level ($\underline{r}$ = .09). However, the length of time one took to respond was not correlated with gender, community involvement, size of community, or quality of life. Thus, the responding sample may be biased in terms of age (younger recipients over-sampled), salary (lower salaries over-sampled), and education level (lower education levels over-sampled). It was assumed, however, that the sample was representative of the population with respect to quality of life, the major dependent variable in this study.

Loss of research participants can be a problem over a long period of time. Gall, Borg, and Gall (1996) found that the response rate of individuals agreeing to participate in a longitudinal panel study declined significantly over time. "The response rate was 61.9% for a one-year follow-up, 37.9% after 5 years, and 27.9% after 11 years." (p. 379).

Spearman rho correlation coefficient, point biserial correlation, and multiple correlations were used to describe associations between variables. T-test procedures were used to compare the QOL of graduates of an area of study who were subsequently employed in that area to those who were employed outside their area of study.

Results and Findings

Mean QOL scores for domains, sub-domains, and total scale indicated that being and belonging domains scores ranked equally high with each reporting QOL scores of 1.45 (Table 1). Sub-domains that rated especially high (>1.50) were spiritual being (1.80), physical belonging (1.55), and social belonging (1.50). Domain, sub-domain, and total scale mean QOL scores indicate a vast majority of survey participants have a very acceptable to excellent QOL.

Table 1

Quality of Life Scores for Domains, Subdomains, and Total Scale of the Qualit Life Profile of Houston Livestock Show & Rodeo Survey Participants, 1998

QOL Domain	n	Mean	SD
Being	**1482**	**1.45**	**.75**
Physical	1498	1.23	.83
Psychological	1496	1.33	.92
Spiritual	1496	1.80	.94
Belonging	**1432**	**1.45**	**.77**
Physical	1490	1.55	.94
Social	1475	1.50	.93
Community	1459	1.27	.88
Becoming	**1459**	**1.18**	**.81**
Practical	1473	1.20	.85
Leisure	1490	1.15	.97
Growth	1479	1.17	.96
Total Scale	**1390**	**1.36**	**.71**

Overall QOL scores were recoded into descriptive categories using the following distribution: excellent (score >1.50), very acceptable (score of .51 to 1.50), adequate (score of -.50 to .50), problematic, (score of -.51 to -1.50), and very problematic (score <-1.50) (Quality of Life Research Unit, 1998). Overall, 37.9% of survey participants had an excellent QOL while 52.3% have a very acceptable QOL (Figure 2). There were only .3% of survey participants found to have a problematic QOL while no respondents had a very problematic QOL.

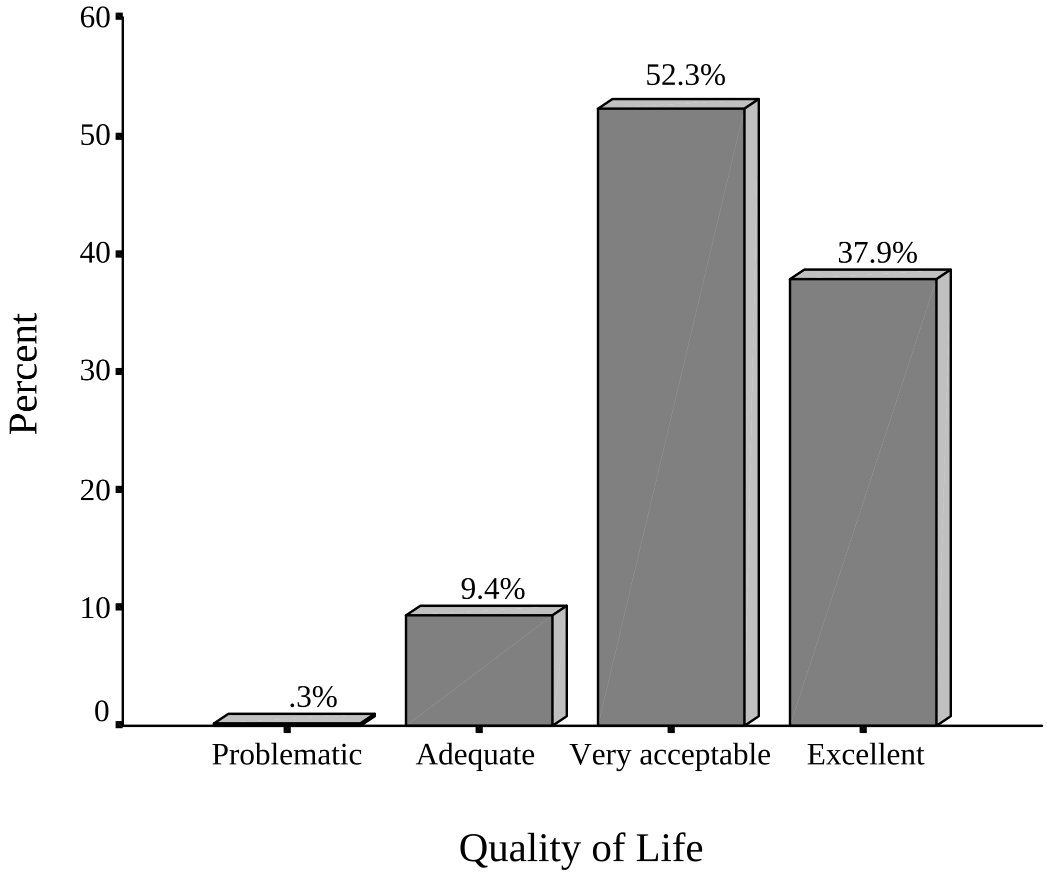

Figure 2. *Quality of life of Houston Livestock Show and Rodeo survey participants, 1998.*

Reliability of the QOLP was determined by examining internal consistency. Internal consistency coefficients, Cronbach's alpha for importance, satisfaction, and QOL for each sub-domain, the three broad domains, and for the overall scale (Table 2). For importance, all domain and sub-domain scores exceeded .70, except for social belonging (.70). Overall importance had an internal consistency coefficient of .94. For satisfaction, social belonging had the lowest coefficient, .73, with overall satisfaction having a value of .96. QOL coefficients were consistent with satisfaction coefficients with the instrument having an overall QOL coefficient of .96.

Table 2

Internal Consistency (Cronbach's alpha) for Domains, Subdomains, and Total Scale for the Quality of Life Profile of Houston Livestock Show & Rodeo Survey Participants, 1998

QOL Domain	Importance	Satisfaction	QOL
Being	**.86**	**.90**	**.91**
Physical	.75	.80	.81
Psychological	.81	.85	.86
Spiritual	.78	.83	.84
Belonging	**.87**	**.88**	**.89**
Physical	.81	.84	.85
Social	.70	.73	.73
Community	.76	.78	.78
Becoming	**.88**	**.91**	**.92**
Practical	.75	.78	.79
Leisure	.76	.85	.86
Growth	.83	.86	.87
Total Scale	**.94**	**.96**	**.96**

Conclusions/Implications/Recommendations

Before any conclusions are made, remember that the population for this study has previously demonstrated above average academic and leadership abilities by their selection as a recipient of a HLS&R scholarship award. All participants have or are attending college and may be significantly different from the general public.

On the basis of the evidence from this study, two variables--involvement in voluntary organizations and religious associations, and gender--were significantly related to QOL. Females and those who had higher levels of community involvement tended to have higher QOL scores. Involvement was the strongest correlate of overall QOL. This conclusion supports the findings by Brinkerhoff and Jacob (1985), Edwards and Klemmack (1973), Palmore and Luikart (1972), and Graney (1975) who found that the more individuals are involved in voluntary organizations and/or religious associations the more likely they were to report a higher QOL.

No evidence indicated that education, income, and place of residence were related to QOL, nor that graduates employed in their area of study have a higher QOL.

Overall, QOL for individuals in this population was high with over 90%, indicating very acceptable or excellent QOL. While there are no comparable studies using the QOLP to measure QOL, Campbell, Converse, and Rodgers (1976) did report findings about "overall life satisfaction" (p.46) on a nationwide probability sample of 2,147 adults. They found 82% of this sample to be satisfied with QOL compared to more than 90% of the sample of HLS&R scholarship recipients who rate their QOL as very acceptable or excellent. On the other hand, the Campbell, Converse, and Rodgers sample included almost 7% who reported dissatisfaction with their QOL. The sample for this study had less than 1% with a problematic QOL. So, based on this comparison, HLS&R scholarship recipients may perceive that they have a higher QOL overall than do members of the general population. An interesting finding of this study was that no individuals indicated a very problematic QOL.

Evidence from this study indicates that the more individuals are involved in organizations the higher their QOL. This implies that the HLS&R Scholarship Committee emphasize involvement in extracurricular activities and voluntary clubs and youth organizations as part of the criteria for selection of scholarship recipients.

The value of the HLS&R scholarships is indicated by the 95% rate of persistence in completing an undergraduate program of study, compared with 52% nationally. This implies that the HLS&R Scholarship Program has provided extraordinary assistance to Texas youth by encouraging and/or facilitating these students to graduate from college.

All participants in this study were recipients of HLS&R scholarships. Additional research using the QOLP should be conducted comparing non-scholarship recipients with those receiving scholarships.

The QOLP, based on internal consistency coefficients, proved to be a reliable instrument and should be used for further research. Further research on community involvement, religious association, and leadership and their relationship to QOL should be conducted. Research should be conducted to see if the selection process that is used to award scholarships is an indicator of individuals expected to have high QOL.

QOL scores can provide standards against which individual or program success, within specific domains or overall, can be measured. Research focusing on life conditions of individuals who have high QOL scores will provide valuable information to individuals and programs about those conditions that seem to promote QOL.

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High School Agricultural Communications Competencies: A National Delphi Study

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Abstract

The major purpose of this study was to identify competencies that should be achieved by high school students who complete courses in agricultural communications. Identification of the competencies came from industry leaders, high school agricultural education teachers, and agricultural communications university faculty. As a means of accomplishing the purpose of the study, answers to the following questions were sought:

1. What specific topics should be included in a high school curriculum for agricultural communications?
2. For each topic identified, what competencies should agricultural communications students possess upon completion of the program?
3. For each competency identified, at what scholastic level should they be introduced to the student?

A three-round Delphi technique was the principle procedure used to conduct the study with a total of 75 individuals being asked to participate in round one. In the first round, the panel identified 11 topic areas that should be included in a high school agricultural communications course: (1) Writing; (2) Computer/Information Technology; (3) Agricultural Industry; (4) Communications History; (5) Professional Development; (6) Research/ Information Gathering; (7) Ethics; (8) Public Relations/Advertising/ Marketing; (9) Leadership Development; (10) Legislative Issues; and (11) Communication Skills.

Resulting rounds produced 93 competencies within the 11 topic areas that were identified for potential inclusion in the high school curriculum. Of the 93 competencies, two were eliminated due to lack of agreement by the panel. Scholastic level ratings by the panel further reduced the number of competencies appropriate for high school students to 76 and categorized the remaining competencies according to appropriateness for introduction at the freshman, sophomore, junior and senior level.

Introduction

The National Research Council (1988), in its final report on agricultural education, spoke of the tremendous need for agricultural literacy and "education about agriculture." The Council recommended that agricultural education be expanded to include education in this area. Lockaby and Vernon (1998) contend that agricultural communications has always been an important component of the agricultural education program and an even closer relationship should exist. Birkenholz and Craven (1996) have noted agricultural communications is one of the most important aspects of agricultural education. Osborne and Phipps (1988) list skills in agricultural communications as one of the goals of agricultural education.

A national steering committee, charged with the concept of "reinventing agricultural education" (National Council for Agricultural Education, 1999), concluded that one of the major goals of agricultural education should be to enhance agricultural literacy skills. In 1999, the National FFA Organization, which conducts competitive events to test curricula knowledge of high school agricultural education students, started a national competition in agricultural communications. Approval of this competition by the National FFA Board of Directors is a clear indication of the recognized importance of agricultural communications as part of the high school agricultural education program.

In order for realistic priorities for instructional developments to occur, the curriculum planning process should involve all affected by the program. Those involved include teachers, employers, and employees (Diamond, 1989; Sprecker, 1996). Finch and Crunkilton (1989) indicate it is vitally important to ensure that curriculum content reflect the needs of the work force. Bailey-Evans (1994) contends the explosion of knowledge in agriculture and a parallel revolution in communications has created a demand for curriculum evaluation in the area of agricultural communications. According to Sprecker (1996), the need for periodic examination of agricultural communications programs and curricula is acute. Bailey-Evans (1994) notes agricultural communications curriculum need to be continually expanded and updated to reflect the technological advancements of today and the future.

Sprecker (1996) noted the competencies needed to become an agricultural communicator have changed with technology and job requirements, and there is a pressing need to examine the agricultural communications curriculum. Terry et al. (1995) claim that specialization and scientific discovery in the field of food, agriculture, and natural resources has created a new need to communicate information about this area. If academic curriculum is to meet the needs of industry, "agricultural communications must continually survey professionals to determine the needs and skills required for a career in agricultural communications and then adjust the curriculum accordingly" (Sprecker & Rudd, 1998 p. 2).

Purpose and Research Questions

The major purpose of this study was to identify competencies that should be attained by high school students who complete courses in agricultural communications.

As a means of accomplishing the purpose, answers to three questions were sought:

1. What specific topics should be included in a high school curriculum for agricultural communications?

2. For each topic identified, what competencies should agricultural communications students possess upon completion of the program?

3. For each competency identified, at what scholastic level should they be introduced to the student?

Methodology

A three-round Delphi technique was the principle procedure used to conduct this study. A technique suggested by Anderson and Jones (1986) was used to select one segment of the panel of experts. State supervisors of agricultural education from all 50 states were used as third parties to nominate agriscience teachers in their state with a strong interest in agricultural communications. The nomination process resulted in 33 individuals from 27 states who served as the high school teaching experts for this study. The second segment of the panel of experts consisted of agriculture industry leaders. The individuals selected for this segment were the executive officers of seven agricultural communications-related professional organizations, which resulted in 21 individuals. The third subgroup of the panel of experts was university faculty that were teaching agricultural communications courses during the 1999-2000 school year. Twenty-one university faculty were included in the initial panel. The three subgroups comprised a total of 75 individuals who were asked to participate in Round One of the study.

From the reviewed literature, an open-ended questionnaire consisting of three questions was developed. These questions were validated for content regarding their appropriateness to the objectives of the study by a panel of faculty and graduate students. The instrument was pilot tested in Texas using agricultural communicators, agricultural students, and agriscience teachers who were not included in the selected panel of experts. Following completion of the pilot test, the researcher made revisions based on the results and suggestions from those involved in the pilot test.

The Round One questionnaire consisted of three open-ended questions. The panel of experts was asked to list several answers to each open-ended question under investigation. Frequencies, percentages, and rankings were used to summarize the responses to this round. Three independent readers completed this technique on the round one responses. The three readers then came together and collapsed similar responses. Dillman's Total Design Method (1978) was used for non-response follow-up. A total response of 76% was achieved for this round.

In Round Two, the panel of experts was presented with an instrument which asked them to do two things: (1) rate the 82 competencies that emerged from Round One in terms of appropriateness for a high school agricultural communications curriculum, and (2) identify the scholastic level at which each competency should be introduced. The panel was asked to rate each competency using a four-point Likert-type scale with 1 = "Strongly Disagree," 2 =

“Disagree, ” 3 = “Agree,” and 4 = “Strongly Agree.” The scale was used to determine each panel member’s level of agreement as to the inclusion of the competency in a high school agricultural communications curriculum. The researchers determined *a priori* that only those competencies receiving a 75% level of agreement or higher would be used for inclusion in the curriculum. In addition to evaluating the 82 competencies, panel members were asked to list additional competencies missed in Round One. They were also asked to identify the scholastic level where each competency should be introduced, using the following scale: 1 = “High School Freshman,” 2 = “High School Sophomore,” 3 = High School Junior, 4 = “High School Senior,” and 5 = “College.” The College category was included allowing the panel member to identify competencies believed to be too advanced for high school. Dillman’s (1978) non-response follow-up procedures were followed. Forty-three of the 56 individuals responded for a total response rate of 77%. Frequencies, percentages, and ranks were used to evaluate the second round responses.

Round Three served as the final round for the study. Because of the consensus found on the 82 items in Round Two, only the 11 new competencies identified in Round Two were submitted to the panel in Round Three for members’ evaluation. The instrument was sent to 41 of the 43 members who responded in Round Two. Two of the panel members indicated they would not be able to participate in the last round due to uncontrollable circumstances. Dillman’s (1978) non-response follow-up procedures were followed. Thirty-six individuals responded for a total response rate of 88%. Frequencies, percentages, and rankings were used to evaluate the third round responses.

Findings

Research Question 1

The open-ended question regarding what topics should be included in a high school agricultural communications course produced 262 responses from the panel. Analysis of the responses produced the following 11 topic areas: (1) Writing; (2) Computer/Information Technology; (3) Agricultural Industry; (4) Communications History; (5) Professional Development; (6) Research/Information Gathering; (7) Ethics; (8) Public Relations/Advertising/ Marketing; (9) Leadership Development; (10) Legislative Issues; and (11) Communication Skills.

Research Question 2

Ninety-three competencies were identified and evaluated by the panel of experts. One hundred percent of the panel agreed or strongly agreed that ninety one competencies should be included in the high school agricultural communications curriculum. Competencies receiving 100% levels of agreement were “Identify the components and format of news releases,” “Write a professional letter,” “Utilize correct grammar,” “Utilize correct spelling,” “Utilize correct punctuation,” “Identify what makes a topic newsworthy,” “Utilize appropriate agricultural terminology,” “Identify current issues and concerns in the agricultural industry,” “List qualities of an effective communicator,” “Identify the various career opportunities in agricultural communications,” “Demonstrate professional/business etiquette,” “Demonstrate a proper work ethic,” “Demonstrate listening skills,” “Research both sides of an issue,” “Check facts,” “Identify biased information," "Identify sources for information," "Discuss the role of public relations in agricultural companies," "Discuss the role of public relation in agricultural organizations," "Speak intelligently before a group," "Effectively utilize the Internet" and "Properly use a 35 mm camera."

Competencies receiving a 90-99% level of agreement were "Effectively interview a person" (97.7%), "Write a quality thank-you note" (97.7%), "Use e-mail properly" (97.7%), "Identify barriers to effective communication" (97.7%), "Interview for employment" (97.7%), "Work in a team activity" (97.7%), "Demonstrate proper phone skills" (97.7%), "Work under pressure" (97.7%), "Identify the importance of correctly reporting the facts" (97.7%), "Deliver a formal, oral presentation using clear enunciation, gestures, tone and vocabulary" (97.7%), "Give an effective interview" (97.7%), "Identify the basic workings of the government systems and how it affects the agricultural industry" (97.7%), "Properly use a digital camera" (97.7%), "Demonstrate different methods of communication" (97.6%), "Demonstrate the ability to cite sources" (97.1%), "Write a news story" (97.1%), "Discuss how current bills will affect agriculture" (97.0%), "Write a news release" (95.4%), "Accurately proofread a document" (95.4%), "Utilize the basic principles involved in technical writing" (95.4%), "Seek, gather and synthesize information" (95.4%), "Distinguish between right and wrong" (95.4%), "Properly use a video camera" (95.4%), "Write a feature story" (95.3%), "Write a caption for photos" (95.3%), "Perform basic word processing" (95.3%), "Converse knowledgeably on the different areas in agriculture" (95.3%), "Identify the key elements of a public relations campaign" (95.3%), "Utilize desktop publishing techniques" (95.2%), "Identify appropriate file formats when using scanning programs" (95.2%), "Demonstrate the ability to be an effective spokesperson for agriculture" (94.1%), "Determine whether a topic would be best covered in a news article or feature article" (93.1%), "Create a resume" (93.1%), "Identify various professional communication organizations" (93.1%), "Identify the importance of an advertising campaign" (93.0%), "Discuss the techniques and principles involved in public speaking" (93.0%), "Utilize correct parliamentary procedure" (93.0%), "Effectively scan a document" (92.9%), "Identify bias in media stories" (91.2%), "Identify different audiences" (91.1%), "Write for broadcast" (90.7%), "Effectively edit a story" (90.7%), "Write a speech" (90.7%), "Identify strategies to improve communication" (90.7%), "Prepare a public relations campaign" (90.7%), "Prepare a 4-6 minute speech within a 30-minute preparation time" (90.7%), "Deliver a radio broadcast" (90.7%), "Create and design a web page" (90.5%), "Target different audiences" (90.6%) and "Develop a multimedia presentation" (90.5%).

Competencies receiving a 80-89% level of agreement were "Write for the web" (88.4%), "Discuss libel law" (88.4%), "Discuss the Freedom of Information Act" (88.4%), "Deliver a TV broadcast" (88.4%), "Identify current legislative bills that affect agriculture" (88.2%), "Discuss the role of public relations in advertising agencies" (86.1%), "Describe the history of agricultural communications" (86.0%), "Describe the communications model" (86.0%), "Demonstrate sales skills" (86.0%), "Utilize graphic editing programs" (85.7%), "Discuss the importance of belonging to professional organizations" (85.3%), "Interpret statistics" (83.8%), "Identify the basics of corporate communications" (83.8%), "Utilize an Associated Press stylebook" (83.7%), "List the benefits of attending professional organization meetings" (82.3%), and "Define media literacy" (80.9%).

Competencies receiving a 75-79% level of agreement were “Identify the steps in the printing/developing process” (79.0%), “Interpret the basics of the commodities market” (76.8%), and “Apply common sense logic to an economic trend analysis” (76.7%).

Two competencies did not meet the 75% agreement criteria. The two competencies were “Analyze and apply technical data and procedures found in service manuals” (69.0%), and “Utilize a nonlinear video-editing program” (65.0%).

Research Question 3

The ninety-three competencies were categorized by the 11 topics that were identified. Within each topic area, the panel identified the scholastic level at which each competency should be introduced. Mode responses for the scholastic level of introduction were identified and used in reporting the results.

Introduction Level for Writing Competencies

The panel determined it was appropriate to introduce all of the writing competencies at the high school level. For five of the competencies, a majority of the panel believed they should be taught at the freshman level. These five competencies and the percentage of the respondents who believed they should be introduced at the freshman level were “Write a quality thank-you not” (73.8%), “Utilize correct spelling” (73.2%), “Utilize correct punctuation” (73.2%), “Utilize correct grammar” (70.7%) and “Write a speech” (50.0%). The panel was evenly divided in their agreement that one writing competency , “Identify what makes a topic newsworthy,” should be introduced at the sophomore level (35.7%) or the junior level (35.7%).

Twelve additional writing competencies were identified as best introduced at the junior level. Those competencies with a mode level of agreement at the junior level were “Identify what makes a topic newsworthy” (48.8%), “Create a resume” (47.6%), “Write a news story” (44.4%), “Write captions for photos” (42.9%), “Determine whether a topic would be best covered as a news article or feature article” (40.5%), “Accurately proofread a document” (40.5%), “Write a professional letter” (39.5%),“Utilize an associated press stylebook” (39.0%) “Write a news release” (38.1%), “Write for the web” (35.7%), “Write a feature story” (33.3%), “Effectively edit a story” (33.3%) and “Effectively interview a person” (28.6%). The last three competencies, “Write a feature story,” “Effectively edit a story,” and “Effectively interview a person” had a bi-modal level of agreement, with the same percentage rating them as being best introduced at the senior level.

Two competencies were also rated as being best introduced at the senior level, according to the mode level of agreement. Those two competencies were “Write for broadcast” (39.5%) and “Utilize the basic principles involved in technical writing” (26.2%).

Introduction Level for Computer/Information Technology Competencies

The panel found that it was appropriate to introduce all but one of the computer/information technology competencies at the high school level. A majority of the panel indicated three of the competencies were best introduced at the freshman level. These three competencies and their level of agreement with freshman introduction were "Perform basic word processing" (76.7%), "Use e-mail properly" (55.8%) and "Effectively utilize the Internet" (52.8%).

Three computer/information technology competencies were identified as being best introduced at the junior level, according to the mode level of agreement. These competencies and their respective levels of agreement for junior introduction were "Effectively scan a document" (31%), "Develop a multimedia presentation" (26.2%) and "Utilize graphic editing programs" (26.2%). The last competency, "Utilize graphic editing programs," was bi-modal with 26.2% of the panel agreeing that it should be best taught at the senior level. Other competencies rated as senior level for introduction were "Create and design a web page" (34.9%), "Utilize desktop publishing techniques" (33.3%) and "Identify appropriate file formats when using scanning programs" (31.0%). The final competency in the computer/information technology topic, "Utilize a nonlinear video-editing program," was rated by a majority of the panel (60.0%) as being best introduced at the college level.

Introduction Level for Agricultural Industry Competencies

The panel found all three agricultural industry competencies are suitable for introduction at the high school level. Nearly one-half (48.8%) of the panel believed one competency, "Utilize appropriate agricultural technology," should be introduced at the freshman level. Although the panel was more divided as to where the competency "Identify current issues and concerns in the agricultural industry" should be introduced, the most common response was introduction at the sophomore level (27.9%). The most common response for the final competency, "Converse knowledgeably on the different areas in agriculture," was evenly split between introduction at the junior level and introduction at the senior level (25.6% each).

Introduction Level for Communication History Competencies

One communication history competency had a wide range of opinions as to when it should be introduced. The most common response for introduction of the competency, "List qualities of an effective communicator," was evenly split between the freshman and junior level (27.9% each). The remainder of the communication history competencies had junior level introduction as the most common response by the panel. These competencies and the percentage of the panel who agreed they should be introduced at the junior level were "Identify barriers to effective communication" (46.5%), "Identify strategies to improve communication" (39.5%), " Describe the communications model" (35.7%), "Define media literacy, basic elements and techniques" (35.7%), "Describe the history of agricultural communications" (32.6%) and "Demonstrate different methods of communications" (31.0%).

Introduction Level for Professional Development Competencies

The panel's most common response for nearly one-half of the competencies in professional development was freshman introduction. These competencies and the percent of the panel who agreed with freshman introduction were "Demonstrate listening skills" (61.9%), "Work in a team activity" (52.4%), "Demonstrate proper phone skills" (46.5%) and "Demonstrate proper work ethic" (46.5%). Two competencies, "Work under pressure" (41.9%) and "Demonstrate professional/business etiquette" (33.3%) most common rating was junior level. Three competencies, "Interview for employment" (39.5%), "Identify various professional communications organizations" (38.1%) and "Identify the various career opportunities in agricultural communications" (35.7%) were most commonly rated as senior level. Two competencies "List the benefits of attending professional organization meetings" (41.7%) and "Discuss the importance of belonging to professional organizations" (33.3%) were most commonly rated as college level.

Introduction Level for Research/Information Gathering Competencies

The panel rated most of the research/information gathering competencies as advanced, with the most common rating for all but one competency at the junior level or above. The competency, "Demonstrate the ability to cite sources correctly," had 31.4% of the rating it as freshman level. Five competencies were found to be appropriate at the junior level. Those competencies and the percentage of panel members that rated the competency as junior level were "Identify biased information" (44.2%), "Identify sources for information" (42.9%), "Check facts" (41.9%), "Research both sides of an issue" (39.5%) and "Analyze and apply technical data and procedures found in service manuals" (31.7%).

The competency "Seek, gather and synthesize information" was most commonly rated as senior level (30.2%). The last research/information gathering competency, "Interpret statistics," had the same percentage of panel members (34.9%) rating the competency at senior and college level, which were the most common responses.

Introduction Level for Ethics Competencies

There were three competencies under the topic of ethics in this survey. One competency, "Distinguish between right and wrong," was rated by a majority of the panel (69.0%) as a freshman level competency. One competency, "Identify bias in media stories," had an equal percentage of panel members (27.8%) rating it both junior and senior level. The other ethic competency, "Identify the importance of correctly reporting the facts," had two common responses with an equal number of panel members rating this competency as a freshman level or junior level (31.0% each).

Introduction Level for Public Relations/Advertising/Marketing Competencies

One-half of the public relations/advertising/marketing competencies had a most common rating of junior level. The junior level competencies and the percentage of panel members that rated them as junior were "Identify the key elements of a public relations campaign" (37.2%), "Discuss the role of public relations in agricultural companies" (37.2%), "Discuss the role of public relations in farm organizations" (34.9%), "Demonstrate sales skills" (28.6%), "Identify the importance of an advertising campaign" (27.9%), and "Identify different audiences" (27.8%). Two of the above mentioned competencies "Discuss the role of public relations in farm organizations" and "Identify the importance of an advertising campaign" had the same number of panel members rating them as senior level.

The competency, "Prepare a public relations campaign," had equal percentages of panel members (37.2%) rating it as a senior or college level for the most common responses. Five additional competencies had college level as the most common response. These competencies and the percentage of members that rated them as college level were "Apply common sense logic to an economic trend analysis" (50.0%), "Identify the basics of corporate communications" (44.2%), "Interpret the basics of the commodities market" (41.5%) and "Discuss the role of public relations in advertising agencies" (38.1%), and "Target different audiences" (30.6%).

Introduction Level for Leadership Development Competencies

The majority of the leadership development competencies had frequent rating of freshman level. The freshman level competencies and the percentage of the panel agreeing with freshmen introduction were "Utilize correct parliamentary procedure" (65.0%), "Discuss the techniques and principles involved in public speaking" (64.3%), "Deliver a formal, oral presentation using clear enunciation gestures, tone and vocabulary" (54.8%), and "Speak intelligently before a group" (39.0%).

The final three leadership development competencies were most commonly rated as junior level. The three competencies and the percentage of panel members that rated them as junior level were "Give an effective interview" (47.6%), "Prepare a 4-6 minute speech within a 30-minute preparation time" (41.5%) and "Demonstrate the ability to be an effective spokesperson for agriculture" (34.3%).

Introduction Level for Legislative Issues Competencies

The panel's most common rating for introduction of each of the legislative issue competencies was at either the senior or college level. One competency, "Identify the basic workings of the government system and how it affects the agricultural industry" had 48.8% of the panel rating it as senior level. One competency, "Discuss how current bills will affect agriculture," had the same percentage (41.7%) of panel members rating it as senior or college level. The other three competencies, "Discuss libel law" (51.2%), "Identify current legislative bills that affect agriculture" (47.1%) and "Discuss the Freedom of Information Act" (44.2%), were most commonly rated as college level competencies (51.2% and 44.2%, respectively).

Introduction Level for Communication Skills Competencies

One communication skill competency, "Properly use a 35 mm camera," had a tie for the most common response with 32.6% of the panel members rating it for introduction at either the sophomore or junior level.

Three competencies were most commonly rated as being appropriate for introduction at the junior level. Those three competencies and the percentage of panel members rating it at the junior level were "Properly use a digital camera" (40.5%), "Properly use a video camera"

(31.0%) and “Identify the steps in the printing/developing process” (26.2%). The final two communication skill competencies were most commonly rated as college level. The two competencies and the percentage of panel members rating them as college level were, “Deliver a radio broadcast” (35.7%), and “Deliver a TV broadcast” (42.9%).

Conclusions

The conclusions for the study are based on interpretations of data presented in the study and are restricted to the populations surveyed. It is important to note that mode responses from the panel were used to determine when a competency should be introduced. In several instances where the response was bi-modal, the highest scholastic level of introduction was utilized to interpret the results. Based on this information, the researchers makes the following conclusions:

1. The following topic areas are appropriate for use in developing a curriculum in agricultural communications for high school students:
   - Writing
   - Computer/Information Technology
   - Agricultural Industry
   - Communications History
   - Professional Development
   - Research/Information Gathering
   - Ethics
   - Public Relations/Advertising/Marketing
   - Leadership Development
   - Legislative Issues
   - Communication Skills

2. The following represents the major topic areas and competencies that should be utilized in developing an introductory agricultural communications curriculum for high school freshmen and sophomores:
   Writing - Write a quality thank-you note; utilize correct spelling; utilize correct punctuation; utilize correct grammar; and write a speech.
   Computer/Information Technology – Perform basic word processing; use e-mail properly; and effectively utilize the Internet.
   Agricultural Industry – Utilize appropriate agricultural terminology; and identify current issues and concerns in the agricultural industry.
   Professional Development – Demonstrate listening skills; work in a team activity; demonstrate proper phone skills; and demonstrate a proper work ethic.
   Research/Information Gathering – Demonstrate the ability to cite sources correctly.
   Ethics – Distinguish between right and wrong.
   Leadership Development – Utilize correct parliamentary procedure; discuss the techniques and principles involved in public speaking; deliver a formal, oral presentation using clear enunciation, gestures, tone and vocabulary; and dpeak intelligently before a group.

3. The following represents the major topic areas and competencies that should be utilized in developing an intermediate agricultural communications curriculum for high school juniors:

Writing – Identify what makes a topic newsworthy, identify the components and format of news releases, create a resume, accurately proofread a document, write a professional letter, utilize an Associated Press Stylebook, write a news release, write for the web, and write a news story.

Computer/Information Technology – Effectively scan a document; and develop a multimedia presentation.

History – Describe the history of agricultural communications; demonstrate different methods of communications; list qualities of an effective communicator; identify barriers to effective communication; define media literacy, basic elements and techniques; identify strategies to improve communication; and describe the communication model.

Professional Development – Develop the ability to work under pressure; and demonstrate professional/business etiquette.

Research/Information Gathering – Identify biased information; identify sources of information; check facts; and research both sides of an issue

Ethics – Identify the importance of correctly reporting the facts.

Public Relations/Advertising/Marketing – Identify the key elements of a public relations campaign; discuss the role of public relations in agricultural companies; demonstrate sales skills; and Identify different audiences.

Leadership Development – Give an effective interview; prepare a 4-6 minute speech within a 30-minute preparation time; and demonstrate the ability to be an effective spokesperson for agriculture.

Legislative Skills – Identify the basic workings of the government system and how it affects the agricultural industry.

Communications Skills – Properly use a 35 mm camera; properly use the digital camera; properly use a video camera; and identify the steps in the printing/ developing process.

4. The following represents the major topic areas and competencies that should be utilized in developing an advanced agricultural communications curriculum for high school seniors:

Writing – Write a feature story; effectively edit a story; effectively interview a person; write for broadcast; and utilize the basic principles involved in technical writing.

Computer Information Technology – Utilize graphic editing programs; create and design a web page; utilize desktop publishing techniques; and identify appropriate file formats when using scanning programs.

Agricultural Industry – Converse knowledgeably on the different areas in agriculture.

Professional Development – Interview for employment; identify various professional communications organizations; and identify the various career opportunities in agricultural communications.

Research/Information Gathering – Seek, gather and synthesize information.

Public Relations/Advertising/Marketing – Discuss the role of public relations in farm organizations; and identify the importance of an advertising campaign.

Legislative Issues – Identify the basic workings of the government system and how it affects the agricultural industry.
Ethics – Identify bias in media stories.

5. The following represents major competencies that are not suitable for high school instruction, but rather should be introduced at the college level:
   - Utilize a nonlinear video-editing program; interpret statistics; prepare a public relations campaign; apply common sense logic to an economic trend analysis; identify the basics of corporate communications; interpret the basics of the commodities market; discuss the role of public relations in advertising agencies; discuss libel law; discuss the Freedom of Information Act; deliver a radio broadcast; deliver a TV broadcast; discuss how current bills will affect agriculture; identify current legislative bills that affect agriculture; list the benefits of attending professional organization meetings; discuss the importance of belonging to professional organizations; and target different audiences.

Recommendations

The following recommendations are based on the findings and conclusions of this study:

1. The seventy-six competencies identified in this study should be utilized to develop curriculum materials for high school agriscience students. The materials should be developed in three separate units: (a) Introductory Agricultural Communications, (b) Intermediate Agricultural Communications, and (c) Advanced Agricultural Communications. The introductory unit should be utilized for high school freshman and sophomores, the intermediate unit for high school juniors, and the advanced unit for high school seniors.

2. In order to facilitate the development of such curriculum materials, the list of competencies should be disseminated to agricultural educators in the nation. Potential disseminators include the National FFA Organization, the U. S. Department of Education, and the National Council for Agricultural Education.

3. Curricula using these competencies should be pilot tested to determine if changes/additions are needed.

4. The national FFA organization should utilize the competencies in developing and implementing the new National FFA Agricultural Communications Career Development Event.

5. Additional studies should be conducted on the state or regional level to determine if changes or additions need to be made in the competencies in order to be most effective within a particular state or region.

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Analyzing the Texas High School Agricultural Communications Curriculum

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Abstract

The major purpose of this study was to evaluate the agricultural communications curriculum (Agriscience 315) in Texas high schools, using perceptions of agriscience teachers in Texas high schools. The secondary purpose was to determine perceived abilities of agriscience teachers to teach agricultural communications courses. As a means of accomplishing the purpose of the study, answers to the following questions were sought. (a) What are the characteristics of Texas teachers who were teaching agriscience in the 1999-2000 school year? (b) What competencies do teachers think students should master upon the completion of agricultural communication classes in Texas high schools? (c) What are the perceived abilities of agriscience teachers to teach agricultural communications classes? The format for this study is a descriptive survey. A proportional and stratified sample of 200 agriscience teachers was selected. A total of 145 surveys were returned. The response rate for this study was 72.5%.

This study found that 67% of the teachers had little or no experience in the field of agricultural communications, but they agreed the competencies related to communication techniques and procedures should be incorporated in the agricultural communications curriculum. Agriscience teachers also indicated their perceived level of teaching skill pertaining to communication techniques and procedures ranged from fair to good.

Introduction/Theoretical Framework

The current goal of agricultural education is to prepare and support individuals for careers, build awareness and develop leadership for the food, fiber, and natural resource systems, which accurately articulates the vision of the future of agriculture (Case & Whitaker, 1998). The main mission of agricultural educators is to convey practical application and transfer of knowledge, skills, and attitudes into real-world settings (Phipps & Osborne, 1988). However, updating instruction in agricultural education programs will always be a challenge. Evolving from production to the ever-changing science, business and technology of agriculture involves major changes in the content of instruction (Case & Whitaker, 1998). The agricultural evolvement in the United States has been advanced through literacy, personal freedom, politics, technological changes, and the growth of mass and specialized media (Burnett, & Tucker, 1990). This explosion of knowledge in agriculture and a parallel revolution in communications have placed a demand upon agricultural communications for curriculum evaluation (Evans, 1975).

Along with problem solving and teamwork skills, communication is a key ingredient to a person's recipe for success and is vital to a successful career in the agriculture industry (IMS, 1998). The Texas Agricultural Science Association has conducted pilot studies to determine the appropriateness of courses in agricultural communications. Texas agriscience programs recently implemented a high school agricultural communications curriculum (Lockaby & Vernon, 1998). Agricultural communications (Agriscience 315) was developed at the request of teachers of agricultural science and technology (IMS, 1998). The course includes a hands-on study of news writing, feature writing, photography, public speaking, product presentation and career opportunities in agricultural communications (Lockaby & Vernon 1998). Agriscience 315 is a technical course for students in grades 9-12 and is designed as a 90-hour, one-semester course of instruction. The communications course is also compatible with full semester, trimester, block, or accelerated-block programs (IMS, 1998). Several studies have been conducted to determine the curriculum needs for university students enrolled in agricultural communications programs (Evans & Bacon, 1994; Sprecker & Rudd, 1998). However, a review of research indicates there has never been a study to determine curriculum needs of students enrolled in Texas high school agricultural communications courses.

To revise the agricultural communications curricula, an in-depth assessment of present curricular offerings is a necessity (Larson & Hoiberg, 1987); however, researchers have noted that only a few detailed studies of agricultural communications curriculum exist (Evans & Bolick, 1982). This information brings us to the question, "What is the academic base for agricultural communications?" (Evans, 1969, p. 2). Flatt (1991) stated "A study should be devoted solely to curriculum to further investigate what courses should be required for each emphasis area, as well as, core curriculum" (p. 44).

Purpose of This Study

The major purpose of this study was to evaluate the agricultural communications curriculum (Agriscience 315) in Texas high schools, using perceptions of agriscience teachers in Texas high schools. The secondary purpose was to determine perceived abilities of agriscience teachers to teach agricultural communications courses.

Questions to Frame the Study

As a means of accomplishing the purpose of the study, answers to the following questions were sought.

1. What are the characteristics of Texas teachers who were teaching agriscience in the 1999-2000 school year as related to: (a) number of years teaching; (b) number of years teaching high school agriculture; (c) experience in agricultural communications; (d) years teaching agricultural communications; (e) number of teachers in agricultural program; (f) size of school; (g) number of students enrolled in agriscience classes; (h) predominant agricultural curriculum being taught; (i) gender; (j) age; and (k) ethnicity?

2. What competencies do teachers think students should master upon the completion of agricultural communication classes in Texas high schools?

3. What are the perceived abilities of agriscience teachers to teach agricultural communications classes?

Limitations

The following limitations apply to the study and must be taken into consideration when applying the results:

1. This study is limited to only agricultural education instructors who where teaching in public, secondary schools in Texas during the 1999-2000 school year.

2. This study is limited to those instructors whose names were obtained from the Vocational Agricultural Teachers Association of Texas Directory.

3. This study is limited to the evaluation of current curriculum content in agricultural communications programs in Texas high schools.

Basic Assumptions

The following are assumptions for this study:

1. The study was representative of all Agriscience teachers in Texas.

2. All participants of the study answered the items on the questionnaire truthfully and to the best of their ability.

Significance of the Study

Since the Agriscience 315 curriculum was established in Texas high schools in 1998, there has been no formal assessment conducted to determine what competencies need to be included. Agricultural education must meet high standards to play an integral part in preparing and supporting students to the best of their ability for agricultural careers, building awareness of the industry and developing leadership skills. It is vital that agricultural education adapt to the vast changes in technology and the agricultural industry itself.

An explosion of knowledge in agriculture and a parallel insurrection in communications have placed a demand for an evaluation of the agricultural communications curriculum (Evans, 1975). To include agricultural communications in high school agricultural education programs, a study must be conducted to aid in identifying weaknesses in the curriculum itself, as well as the instructor's ability to teach the necessary material.

The results of this study will enable high school agriscience educators to enhance their current agricultural communications curriculum and will serve as a foundation for future development of agricultural education programs.

Methodology

Design for the Study

The format for this study is a descriptive survey (Ary, Jacobs, & Razavieh, 1985). In addition to collecting information regarding Texas agricultural education teachers' perceptions of the agricultural communications curriculum, perceived abilities of instructors to teach the curriculum was analyzed. A mailed questionnaire was used to gather the data for this study.

Population and Sample

The target population of this study was all Texas high school agriscience instructors who were teaching in the 1999-2000 school year. During this year, there were approximately 1,511 teachers in the 254 counties in the state of Texas.

Because this was such a large population, it was impractical to survey all teachers. A list of participants was acquired from the Texas Teachers of Agricultural Science & Technology Directory (1999-2000). A formula for estimating sample size recommended by Cochran (1977) was used. By using this formula, it was determined that a sample of 180 was sufficient. Over-sampling was used because past surveys of agriscience teachers have shown low response rates. A total of 200 names were selected from the Directory using sampling techniques as described by Borg and Gall (1994). The sample is proportional and stratified by the area. Due to the large number of agricultural science programs in Texas, the state is divided into ten areas. Dillman's (1978) suggested response rate (70 percent), was used to determine a minimum return rate.

Instrumentation

In an effort to control for non-response error, portions of the Total Design Method (TDM) developed by Dillman (1978) was adopted as "tested guidelines on construction of the cover letter and questionnaire" (Miller & Smith, 1983, p. 46).

The survey was composed in a booklet format according to TDM. The first part was used to determine demographic information from the subjects. The second divided into two sections. Part two-A was designed to survey which competencies the agriscience teachers believed to be the most adequate and useful in instruction. Part two-B consisted of a four-point Likert-type scale using questions to determine perceptions of perceived abilities of agriscience teachers to teach the material. The competencies used in the survey were obtained from the existing Texas Agriscience 315 curricula.

The responses for each item in question were scored from 1 to 4 according to the Likert-type scale (1= poor, 2 = fair, 3 = good, 4 = excellent).

Establishing Validity and Reliability of the Instrument

Validity and reliability in this case refers to the method being used and will indicate the degree to which the evaluation device actually provides evidence of the outcomes desired (Tyler, 1975). Content validity of the instrument was established by submitting a draft of the instrument to a panel of agricultural teacher educators. The panel's recommendations were used to verify the validity of the instrument's content. A pilot test of the instrument was conducted using a test-retest method. The student teaching block in a major Texas university was surveyed for the pilot test. Changes and clarifications were incorporated into the final version of the instrument prior to distributing the survey.

Data Collection

The "Claim for Exemption" form was approved by the human subject committee, and data collection began the second week of April 2000, after using a mailed survey instrument. Procedures recommended for data analysis came from Dillman's (1978) Total Design Method. A cover letter, questionnaire, and return, stamped envelope was mailed to each of the teachers randomly selected for the sample. The first mailing occurred on April 4, 2000, and was received by the teachers during the second week of April.

Each questionnaire was coded to identify the respondents and non-respondents. Reminder post-cards were also mailed to all non-respondents on April 17, 2000. On April 28, 2000, a second mailing of the questionnaire, accompanied with a cover letter and a self-addresses, stamped envelope was sent to each of the non-respondents followed two weeks later (May 12, 2000) by a second mailing of reminder post-cards to non-respondents. A total of 145 surveys were returned. The response rate for this study was 72.5%.

Data Analysis

Survey instrument responses were coded and transferred into a computer file for analysis. Statistical analyses of the data files were completed using SPSS. Descriptive statistics were used to summarize the data pertaining to: (a) the demographic background; (b) teacher responses concerning competencies to be taught; and (c) perceived level of teaching skill for each competency. Frequencies were used to describe the data.

Findings

Characteristics of Respondents

The mean years of teaching for the respondents was 17.2 years, and they taught agricultural education for an average of 15.9 years. A majority of respondents (67.4%) have had no experience in agricultural communications and 67.4% of teachers have also never taught agricultural communications.

Over one-third (36.9%) of teachers were in single teacher departments, although the largest number of teachers (41.8%) were in two teacher programs.

Most of the teachers (70.7%) taught in a 3-A school or smaller and the average amount of students enrolled in agriculture courses was 137. Production agriculture was the predominant agricultural curriculum being taught (73.4%).

An overwhelming amount of teachers (93%) were male. The average age of the respondents was 42 years, with the youngest being 23-years-old and oldest 61-years-old. Furthermore, a substantial majority of agriscience teachers (88.8%) were white/non-Hispanic.

Percent Level of Agreement with Competencies

Level of Agreement for Communication Techniques and Procedures

Teachers were given six competencies for communication techniques and procedures and asked to indicate whether it should or should not be included in the curriculum. The highest rated competency was "Communicating Verbally." A large majority (99.3%) indicated this competency should be included in the agricultural communications curriculum for high school students. Other competencies receiving a 90% level of agreement or higher included "Preparing and Delivering Speeches" (97.9%), "Interviewing Skills and Procedures" (97.9%), "Researching and Communicating Factual Information" (96.5%), "Communicating Non-Verbally" (94.3%), and "Speaking Style" (91.5%).

Level of Agreement on Effective Written Communication Skills

Three of these competencies were perceived as beneficial by more than 90% of the teachers to be included in the agricultural communications curriculum. "Preparing a Written Informative Report" had the highest positive response rate (95.8%). Second was "Targeting an Audience and Choosing a Method of Delivery" (90.8%). Slightly lower was "Recognizing Bias Information in Written Materials" (90.1%), and the lowest percentage was "Identifying Your Writing Style" (77.9%).

Level of Agreement of Employment Characteristics of a Successful Worker in the Modern Workplace

The employment characteristics of a successful worker in the modern workplace were perceived by the teachers as suitable components for the agricultural communications curriculum. The highest rated of these competencies was "Career Opportunities" with 98.6% of the agriscience teachers indicating that it should be included in the high school curriculum. Other competencies receiving a 90% level of agreement or higher included "Supervised Agricultural Experience Activities" (97.9%) "Selection and Application of Employer Expectations" (97.9%), "Workplace Safety" (95.8%), "Career Development Relating to Entrepreneurship and Employment" (95.1%), "Interpersonal Relations" (95.1%), "Social, Organizational, and Technological Systems" (92.9%), and "Information Processing" (91.5%). Last was "Resource Allocation in Systems of Operation in Agricultural Communications" with 87.2% of the teachers indicating that it should be included in agricultural communications curriculum.

Level of Agreement for Effective Visual Communication Skills

Competencies involving effective visual communication skills were also indicated as appropriate for high school agricultural communications curriculum: "Using Technology in Agricultural Communications" (92.9%), "Using Photography in Effective Communications" (81.6%), and "Preparing Video-Essay and Photo-Essays" (73.8%).

Perceived Level of Teaching Skill

Level of Teaching Skill for Communication Techniques and Procedures

Teachers were asked to indicate their level of teaching skill as it pertained to each competency (based on a scale of 4 = excellent; 3 = good; 2 = fair; and 1 = poor). Findings revealed a relatively high level of teaching skill in all four competencies. Competencies, ranked in order of level of teaching, were "Communicating Verbally" (3.20), "Identifying Interviewing Skills and Procedures" (3.13), "Communicating Non-verbally" (2.99), "Researching and Communicating Factual Information" (2.94), "Preparing and Delivering Speeches" (2.92), and "Developing Your Speaking Style" (2.83).

Level of Teaching Skill for Effective Written Communication Skills

The respondent all indicated they have a good level of teaching skill for the four competencies in relation to written communication skills. Ranked in order from highest level of teaching skill to lowest were, "Preparing a Written Informative Report" (3.0), "Targeting an Audience and Choosing a Method of Delivery" (2.9), "Recognizing Bias Information in Written Materials" (2.8), and "Identifying Your Writing Style" (2.6).

Level of Teaching Skill for Employment Characteristics of a Successful Worker in the Modern Workplace

Employment characteristics of a successful worker in the modern workplace involved nine competencies. All responding agriscience teachers believed they had a good or better level of teaching for each competency. In order from highest level of teaching skill, "Career Opportunities" (3.5), "Supervised Agricultural Experience Activities" (3.5), "Selection and Application of Employers Expectations" (3.2), "Personal and Occupational Safety Practices in the Workplace" (3.1), "Career Development Relating to Entrepreneurship and Employment" (3.0), "Interpersonal Relations" (3.0), "Social, Organizational and Technological Systems" (2.8), "Information Processing" (2.8), and "Resource Allocation in Systems of Operation in Agricultural Communications" (2.6).

Level of Teaching Skill for Effective Visual Communication Skills

Findings illustrate that teachers believed they only possess a good level of teaching towards "Using Technology in Agricultural Communications" (2.5). "Preparing Visual-Essays and Photo-Essays" (2.4), and "Using Photography in Effective Communications" (2.2) received a fair level of teaching skill.

Conclusions

The following conclusions are based on interpretations of data presented in the study and are restricted to populations surveyed.

1. Most of the agriscience teachers in Texas who taught in the 1999-2000 school year were middle-aged, non-minority males who were very experienced in the teaching profession (17 years on average) and teaching agriculture.

2. The large majority (67%), of the teachers had little or no experience in the field of agricultural communications. Respondents that had experience had taught the material for very few years.

3. A large majority of teachers work in smaller schools (3- A or smaller) and are the only teacher in the program or at best have one partner. On average they have a small enrollment of students in agricultural courses. Despite changes in agriculture, the overwhelmingly predominant curriculum being taught is production agriculture.

4. As a group, agriculture teachers in Texas agree that all six of the competencies related to communication techniques and procedures should be incorporated in the agricultural communications curriculum (91% or higher).

5. Teachers also indicated their perceived level of teaching skill pertaining to communication techniques and procedures as good with "Communicating Verbally" ranking the highest (3.2), and "Developing Your Speaking Style" the lowest (2.8).

6. A high percent of teachers also responded positive to the four competencies for written communication skills being incorporated into the curriculum. Percents ranged from 96% (preparing a written informative report) to 78% (identifying your writing style).

7. Agriscience teachers perceived themselves as good, but not excellent teachers of written communication skills. This was evidenced by the mean level of teaching skill ranging from 3.0 (preparing a written informative report) to 2.6 (identifying your writing styles).

8. Employment characteristics of a successful worker in the modern workplace competencies were also highly rated as appropriate to be included in the agricultural communications curriculum. All nine competencies ranked 90% or higher in favor

of competencies being included, with the exception of “Resource Allocation” which received 87.2%.

9. Again, agriscience teachers perceived themselves to be proficient in teaching employment characteristics of a successful worker. This was concluded by teachers responding with a range of teaching skill from 3.5 to 2.6. This resulted in a good level of teaching skill.

10. Competencies pertaining to effective visual communication skills were perceived by teachers to be included in the agricultural communications curriculum with the level of agreement ranging from 92.9% with “Technology in Agricultural Communications” to “Preparing Video-essays and Photo-essays” with 73.8%. However, they were ranked the lowest of all groups of competencies.

11. The greatest need in terms of agricultural communications perceived level of teaching skill was for competencies relating to effective visual communication techniques. This was indicated by teachers only indicating a good level of teaching skill for “Technology in the Classroom” (2.5%), and the remaining two “Using Photography in Effective Communications” and “Preparing Video-essays and Photo-essays” only a fair level of teaching skill.

Recommendations

The following recommendations were made as a result of this study:

1. Updates and revisions to the existing Agriscience 315 need to be made to incorporate more background information about the career field of agricultural communications and the new technological advancements being made in media instruction (i.e., computer-aided design, web development, etc.).

2. Since agricultural communications is a relatively new course in the Texas agriscience curriculum, many agriscience teachers may not be aware of the complete extent of the field. Additional information of the breadth and scope of the field should be provided for current agriscience teachers to make them aware of the goals, expectations and accomplishments of agricultural communications. This could be in the form of informational brochures and/or an interactive website.

3. Writing workshops should be conducted at the annual State Agriscience Teacher Professional Improvement Conference to help the agriscience teacher become more familiar with techniques used in writing for the mass media. Additional topics for workshops that should be provided annually to improve instruction include: utilizing technology to enhance agricultural communications instruction, enhancing verbal

communications (preparing and delivering speeches), information processing, and resource allocation in systems of operations in agricultural communications.

4. A concerted effort should be made to utilize the expertise of agricultural communications professionals in the classroom to help educate students on certain competencies when the individual agriscience teacher(s) has limited knowledge of the area (for example, video-essays and photo-essays).

5. Future studies should be conducted to determine if competencies beyond those in the current agriscience 315 curriculum should be included and if any existing competencies need to be excluded from the Texas agricultural communications curriculum. Additional research should also be conducted to determine specific methods of instruction, which are most appropriate to teach agricultural communications competencies.

6. Additional studies should be conducted to determine the expectations of university personnel and professionals of high school graduates of agricultural communications courses.

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A Comparison of Traditional and Non-traditional Students' Reasons for Enrolling in an Agricultural Education Course

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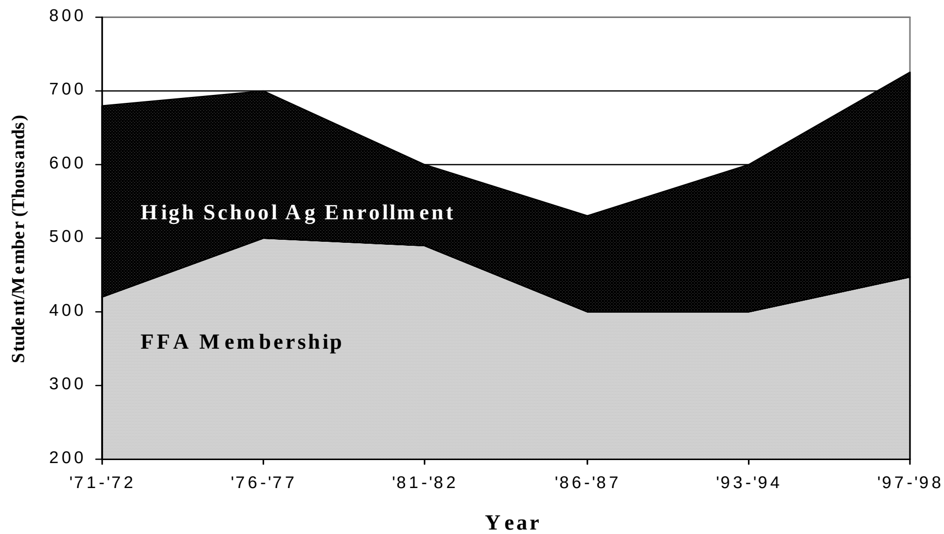
Introduction

While expanded course offerings in areas like Horticulture and Natural Resources have increased Agricultural Education enrollments in the 1990s, student organization membership in the FFA has continued to decrease (National FFA Organization, 1999). Likewise, supervised agricultural experiences continue to decrease. A recent study by the National FFA Organization estimated that roughly half of students enrolled in Agricultural Education courses maintain an SAE or claim membership in the FFA (National FFA Organization, 1999). Figure 1 depicts the upward trends in enrollment with decreases in percentage of FFA membership.

Figure 1.
Trends in Agricultural Education enrollment and FFA membership.



Secondary Agricultural Education programs in the United States were originally directed to educate young men who aspired to be farmers. Students entered as freshmen and completed Vocational Agriculture I-IV where they were exposed to the gamut of farming principles, techniques, and related skills. Today, Agricultural Education courses are designed for young women and men who aspire to the broad career areas found in agriculture (National Research Council, 1988).

With current course offerings varying from Animal Science to Floral Design, the Agricultural Education enrollees come with new perspectives (Hoover & Scanlon, 1991). Fewer students now complete four years of agricultural training as they were in the past (Marshall, Herring, & Briers, 1992). Many now enter as juniors or seniors and seek courses that match their specific interests. With this flexible entrance to the program comes new obstacles for Agricultural Education as teachers struggle to reach new groups of students who come to their programs with vastly different expectations (Marshall, Herring, & Briers, 1992). The influx of more non-traditional students into Agricultural Education programs may result in students who enroll for specific courses, but are not interested in FFA or SAE activities.

Theoretical Framework

There are many possible reasons for students deciding to enroll or not enroll in Agricultural Education. Moore, Kirby, and Becton (1997) also confirmed the idea of pressure on students to earn graduation credits and fulfillment of college entrance requirements, especially when block scheduling was a factor. Rossetti, Elliot, Price and McClay (1989) also found that non-FFA members enrolled in Agricultural Education because they were interested in agriculture, they needed a science credit, they thought it would be an easy class or they were forced to enroll.

From a different perspective, Ullrich and Stapper (1999) found that parents, agriculture teachers and other students in agriculture classes were more influential in causing students to enroll in an agriculture class, while school counselors and other teachers had relatively little influence. It was also found that the perceived fun of courses and FFA activities were strong influences as were personal desires of students. Kotrlik (1987) also found that parents were dominant in influencing students to enroll in Agricultural Education courses.

Herring, Marshall, and Briers (1989) determined that students would seek the advice of counselors, friends, parents, and teachers before enrolling in Agricultural Education courses. Additionally, Luft and Giese (1991) found that the agricultural teacher had an influence on how students perceived agriculture and whether they enrolled in an agriculture class.

Though Brannon (1988) and others suggested that FFA membership is a major reason for students to enroll in Agricultural Education, a study by the National FFA Organization (1999) determined that only 56% of total Agricultural Education enrollees were FFA members. When teachers were asked why students did not become FFA members, 42% said some students do not believe that FFA membership is valuable; 26% said it is unrealistic to expect all agriculture students to be FFA members; and 21 percent said some students do not have adequate time to devote to FFA activities.

Brick (1998) studied FFA members attending the Washington Leadership Conference in order to determine variables influencing members' self-perceived leadership abilities. Influential variables included gender, plans after high school, FFA involvement, and hometown location, rural or urban. Length of membership in the FFA was not found as an influential factor. The author concluded that female FFA members with plans to attend a four-year college, from a large high school with high levels of involvement tended to have the strongest self-perceptions of their abilities. Recommendations included advisors facilitating increased involvement by all members in order to experience leadership roles.

Purpose/Objectives

The purpose of this study was to describe traditional and non-traditional students reasons for enrolling in an Agricultural Education course. To accomplish this purpose, the following objectives were developed:

(1) Compare selected characteristics of traditional and non-traditional Agricultural Education enrollees,

(2) <u>Compare reasons traditional and non-traditional students enrolled in an Agricultural Education course.</u>

Methods/Procedures

The population consisted of junior and senior students enrolled in selected Agricultural Education programs in the Spring of 1999 in Oklahoma. A school profile was developed in order to select Agricultural Education departments in Oklahoma to participate in the study. The profile included schools with multiple teachers in the department and a non-traditional area (Horticulture or Natural Resources) being taught.

This list was narrowed based on the likelihood of obtaining students enrolling in Agricultural Education for the first time as a junior or senior. The researcher was assisted by the staff in the Agricultural Education Division at the Oklahoma Department of Vocational and Technical Education and Agricultural Education Faculty at Oklahoma State University in determining multiple teacher departments which fit the profile. This resulted in the selection of eight schools.

The researcher utilized portions from a questionnaire developed in a previous study by Marshall (1990). The questionnaire included demographic information as well as Likert-type items reflecting various reasons for enrolling as determined by prior research. After the instrument was formulated, additions, deletions and corrections were solicited from the Agricultural Education faculty at Oklahoma State University and the supervisory staff at the Oklahoma Department of Vocational and Technical Education. Suggested changes were made and the instrument was prepared for field-testing. Additionally, state supervisory staff suggested personal visits would provide more realistic data.

A pilot study was conducted in a local school, not part of the study population. Modifications concerning instructions were made based on the results of the pilot study. Initially, each selected school was contacted by a letter from Dr. Eddie Smith, the state program leader for the Agricultural Education Division of the Oklahoma Department of Vocational Technical Education, stating the purpose, importance, and procedure of the study. A follow up phone call was made to a teacher at each school to inquire concerning their willingness to participate.

Once confirmation was made and questions concerning procedures were answered, schools were visited by the researcher or an assistant. Each junior and senior in Agricultural Education classes that day was asked to complete the instrument after being read a disclosure statement. Questionnaires were collected and returned by the researcher or assistant visiting each school. All schools were visited in the month of April, 1999.

Collected data were first separated by school. School data were then separated into two groups: 1) those taking an Agricultural Education class for the first time as a junior or senior and 2) those who were previously enrolled in Agricultural Education. Throughout the remainder of this study, those juniors and seniors taking their first Agricultural Education course as a junior or senior will be referred to as “non-traditional” and those juniors and seniors who had previous years of Agricultural Education will be referred to as “traditional.”

Descriptive statistics and t-tests were used to accomplish the analysis of the data (Pedhazur, 1982). The demographic portions of the instrument dealt with nominal data so frequencies and percentages were utilized. Respondents were also asked to respond to statements related to why they enrolled in Agricultural Education using a five point Likert-type scale. T-tests between traditional and non-traditional groups were used to determine if differences were statistically significant. An alpha level of .01 was selected as the significance level to maintain conservatism.

Results/Findings

Eight schools were found to fit the established school profile, being a multi-teacher department while teaching an expanded course offering of Horticulture or Natural Resources and being likely to have juniors and/or seniors as first time enrollees. This provided 393 useable questionnaires with 190 traditional and 203 non-traditional students. 15 questionnaires were determined not to be useable because an entire category of information or more was missing.

Comparison of Selected Characteristics

Differences were present in the gender of traditional and non-traditional enrollees. With slightly more than one-third of the traditional enrollees, and one-half of the non-traditional enrollees being female.

Place of residence for traditional and non-traditional enrollees did differ significantly (P(t)=.00000) with a larger percentage of non-traditional enrollees (60.10%) living in the city compared to 40.53% for traditional enrollees. Fewer than 10 percent of non-traditional enrollees lived on farms compared to 25.26% of the traditional enrollees. However, plans after graduation did not differ significantly for traditional and non-traditional enrollees.

Career intentions related to an agricultural career differed for traditional and non-traditional enrollees. Of the traditional enrollees, 40.00% reported career intentions related to agriculture compared to only 16.26% for non-traditional enrollees; only 25.26% of traditional enrollees reported career intentions other than agriculture while non-traditional enrollees reported 56.16%.

Differences between traditional and non-traditional enrollees' academic performance were not seen. Those slight differences present were not statistically significant at α=.01 (Table 1).

Table 1
Academic Performance of Traditional and Non-Traditional Enrollees

Grade	**Traditional**		**Non-Traditional**	
	N	%	N	%
A's	15	7.89	33	16.26
A's & B's	83	43.68	101	49.75
B's	19	10.00	4	1.97
B's & C's	54	28.42	39	19.21
C's	8	4.21	11	5.42
C's & D's	7	3.68	12	5.91
D's or Below	2	1.05	2	.99
Overall Academic Index	3.04		3.15	

P(t)=0.108

With regard to activities, traditional and non-traditional enrollees were very similar (Table 2). No statistically significant difference was found in the number of activities traditional and non-traditional enrollees were involved.

Table 2. *Activities of Traditional and Non-Traditional Enrollees*

Activity	**Traditional**		**Non-Traditional**	
	N	**%**	**N**	**%**
FFA	182	95.79	133	65.52
Athletics	87	45.79	109	53.69
Honor Society	33	16.84	56	27.59
Church Group	49	25.79	70	34.48
Band	29	15.26	43	21.18
Vocational Club	34	17.89	32	15.76
Student Council	25	13.16	38	18.72
Language Club	18	9.47	44	21.67
FHA	21	11.05	32	15.76
4-H	32	16.84	3	1.48
Debate	12	6.32	26	12.81
Newspaper	11	5.79	26	12.81
Cheerleading	8	4.21	18	8.87
Hobby Club	8	4.21	14	6.90
Boy/Girl Scouts	17	8.95	9	4.43
Other Club/Organization	30	15.79	21	10.34
Mean # of Organizations	3.14		3.32	

P(t)=0.355

With regard to correlated variables (Table 3), differences were found in the strength of the correlation between Academic Performance and Organization Involvement as this relationship appeared to be stronger for non-traditional enrollees (r=.47).

Table 3. *Correlations Between Academic Performance and Organization Involvement for Traditional and Non-Traditional Enrollees*

Variable	**Traditional Correlation**	**Non-Traditional Correlation**
Academic Performance/Organization Involvement	.32*	.47*

*Significant *r* at α=.01

Few differences were found in the Agricultural Education course enrollment of traditional and non-traditional enrollees. However, a larger proportion, 66.10%, of non-traditional enrollees took Horticulture as compared to 31.05% of traditional enrollees. A greater percentage (8.95%) of traditional enrollees were enrolled in multiple courses concurrently, compared to only 2.46% of non-traditional enrollees.

Reasons for Enrolling

Respondents were asked to respond to statements related to why they enrolled in Agricultural Education using a five point Likert-type scale. Statements were taken from the Marshall (1990) study. Factors with corresponding Cronbach's Alpha for the Marshall study and this study respectively were: Class Characteristics .57, .38; Identity Enhancement .83, .82; Agricultural Interest .74, .74; Instrumental/Practical .60, .44; Significant Others .80, .70; Circumstantial/Disavowance .58, .62

Comparisons between traditional and non-traditional enrollees agreement with enrollment statements (Table 4) using t-tests revealed statistically significant differences in all statements except: "I needed science credit" (t=.79), "The principal or other teacher suggested I take the class" (t=1.47), "My friends suggested I take the class" (t=-1.78), "I heard this class was easy" (t=2.04), "The name or description of the class sounded interesting to me" (t=-2.24).

Responses to the open-ended question were classified into eight different categories, producing differences between traditional and non-traditional enrollees (Table 5). A larger percentage of traditional enrollees enrolled for "Career Preparation," to "Learn About Agriculture," and "FFA/Leadership/Showing" while a larger percentage of non-traditional enrollees enrolled to "Learn About Plants" and for "Disavowance" reasons.

Traditional and non-traditional enrollees were similar with regard to "Fun/Hands On" as a reason for enrolling at 31.58% and 35.47%, respectively. It should also be noted that only one of the eight schools offered science credit for Agricultural Education coursework.

Table 4. Traditional and Non-Traditional Enrollees' Agreement with Enrollment Statements

Statement	**Traditional**		**Non-Traditional**		
	Mean	N	Mean	N	T
I wanted to participate in shows and fairs	3.83	187	2.60	200	-9.94*
I could have a project and/or earn money through work experience	3.83	188	2.79	200	-8.57*
I could be a member of the FFA	4.02	188	2.97	201	-8.48*
I enjoyed working with animals	4.24	188	3.22	200	-8.29*
I thought this class would prepare me for a career in agriculture	3.88	189	2.94	199	-7.70*
The agriculture teacher(s) encouraged me to take the class	3.06	188	2.15	199	-7.16*
Agriculture classes sounded fun	4.28	188	3.48	198	-7.09*
My involvement in agriculture at home got me interested in this class	3.65	189	2.74	199	-6.61*
I could learn things in class that would be useful to me	4.27	188	3.66	201	-5.76*
I could learn how to do things rather than just learn out of a text	4.29	188	3.69	197	-5.63*
I thought I would like this class	4.45	189	4.05	200	-4.34*
I enjoyed being outside the classroom (greenhouse, barn, etc.)	4.39	187	3.96	196	-4.03*
I was placed in this class by the people who do the scheduling	1.73	188	2.17	200	3.97*
I needed an elective class	2.65	186	3.17	199	3.79*
I liked the teacher(s)	4.05	187	3.62	198	-3.63*
It was the only elective available	1.79	185	2.22	200	3.60*
My counselor suggested I take the class	1.90	184	2.28	197	3.29*
My brother(s)/sister(s) or other relatives suggested I take the class	2.84	186	2.41	201	-3.06*
Some of my friends were in this class	3.56	187	3.20	199	-2.75*
My parent(s) or guardian(s) suggested I take the class	2.63	189	2.30	199	-2.52*
The name or description of the class sounded interesting to me	3.70	189	3.42	201	-2.24
I heard this class was easy	3.02	189	3.30	200	2.04
My friends suggested I take the class	3.06	189	2.81	200	-1.78
The principal or other teacher suggested I take the class	1.82	186	1.98	200	1.47
I needed a science credit	2.07	189	2.17	200	.79

Table 5
Responses to Open Ended Questions by Traditional and Non-Traditional Enrollees

Reason	**Traditional**		**Non-Traditional**	
	N	%	N	%
Fun/Hands On	60	31.58	72	35.47
Career Preparation	39	20.52	19	9.36
Learn About Plants	8	4.21	45	22.17
Learn About Agriculture	34	17.89	7	3.45
FFA/Leadership/Showing	24	12.63	3	1.48
Disavowance	7	3.68	28	13.79
Learn About Animals	7	3.68	7	3.45
Science Credit	1	.05	9	4.43

Conclusions/Recommendations/Implications

Based on the findings of this study, the following conclusions were made:

(1) Traditional and non-traditional enrollees differed in gender;

(2) Traditional enrollees tended to be male while non-traditional enrollees were male or female;

(3) More traditional enrollees tended to live on farms or in the country while non-traditional enrollees tended to live in the city or in town;

(4) Traditional and non-traditional enrollees differed significantly on most agreement with enrollment statements though rank of statements showed little difference; and

(5) While both groups enrolled because the course was “fun/hands on,” Traditional enrollees tended to enroll for “Career Preparation” and to “Learn About Agriculture” and non-traditional enrollees tended to enroll to “Learn About Plants.”

The reaction of some in dealing with non-traditional Agricultural Education students is to minimize expectations for this group and eliminate them from our programs. What has become increasingly evident over time is that Agricultural Education courses are in demand by a wide range of students with very diverse interests. To disregard them due to late entrance simply does not do justice to the student or to the Agricultural Education program.

The results of this study should lead us toward further expansion in the areas of Horticulture and plant related courses while ensuring that all of our courses continue to remain “fun and hands-on.” This study indicates that recruitment efforts which focus on animals, agriculture, and FFA may not be reaching all the students that could have an interest in what Agricultural Education programs have to offer.

This study also contradicts the assumption that the majority of non-traditional students enrolled for disavowance reasons. Though these findings may conflict with some previous research on reasons for enrolling (Brannon, 1988; Kotrlik, 1987; Herring, Marshall, & Briers, 1989; and Luft & Geise, 1991), it does indicate that we must continue to find ways to meet the needs of students through promotion of participation in course and outside activities regardless of when they enter the program.

Implications for future research include an examination of teachers' expectations for non-traditional enrollees, students' satisfaction of expectations of courses enrolled, and a qualitative look at reasons non-traditional students enrolled in an Agricultural Education course.

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Tapping into the Creative Potential of Higher Education: A Theoretical Perspective

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Abstract

The purpose of this theoretical article was to stimulate professional discussion in our profession on creativity and how it relates to academic programs in higher education. Due to a dearth of research in an agricultural context, it was hypothesized that faculty are unclear on how to structure instruction to enhance creativity and encourage creative thinking on the part of our students. After a detailed review of the literature on creative thinking, the authors presented a definition of creativity and examined specific variables that influence creativity. A model of the creative thinking process was proposed for the purpose of serving as a cognitive map for faculty as they seek to unleash the creative potential of students. In conclusion, the authors encouraged further discussion on the creative potential in higher education, and recommended that agricultural faculty in higher education use this article as a foundation to develop a more creative learning environment.

Introduction

Higher education is faced with the challenge of making the educational experience relevant to the needs of society as well as maximizing the use of the talents of its stakeholders. According to Boyer (1990):

> What we are faced with, today, is the need to clarify campus missions and relate the work of the academy more directly to the realities of contemporary life. We need especially to ask how institutional diversity can be strengthened and how the rich array of faculty talent in our colleges and universities might more effectively be used and continuously renewed. (p.13)

The W. K. Kellogg Foundation (1999) indicated that to reinvent and reenergize the role of universities, there is a need to create and implement a vision in collaboration with the community. In this atmosphere of team building and problem solving, the university can better promote diversity and serve the needs of society, as well as maximize the talent of its stakeholders.

This brings up a series of questions. How are educators to proceed with implementing this visioning process? Are there certain activities that enhance this process? What are the key attributes that need to be utilized? Are there certain steps? If so, how can they be utilized? The need to be creative is central to the visioning process.

In 1993, Torrance asserted that creativity is one of the essential elements that will enable universities to create this vision. He stated:

> No educational reform can succeed and endure unless it is supported by appropriate retooling in the form of methods, instructional materials, assessment procedures, and statements of objectives. This is true in educational reform that requires creativity or is based in part on research. (p.158)

This retooling must be achieved in a manner that promotes and enhances creativity, teamwork, and problem solving abilities of the university in collaboration with the community.

One of the challenges that confronts higher education is the need to examine the multiple realities of its clientele. Freire and Macedo (1998) stated: "In part the exclusion of social, cultural, and political dimensions from learning and practices gives rise to an ideology of cultural reproduction that produces teachers who are de-skilled and acritical, without much independent thought" (p.3). If higher education is to promote creativity it must reflect upon the realities (of its clientele), discuss how these realities can be utilized to enhance creativity, as well as engage in activities that encourage creativity.

Purpose/Methods/Procedures

The purpose of this theoretical paper is to explore creativity as it relates to higher education programs. In an attempt to accomplish this purpose, the researchers will investigate the meaning of creativity and propose a model of the creative thinking process that can serve as a cognitive map to faculty and stakeholders as they plan for the future and seek to improve instruction. The methods and data sources of this scholarly pursuit involve an in-depth literature review of the creative thinking literature.

Findings

Creativity is a complex construct and is most commonly expressed through a broad range of intelligences including linguistic, musical, mathematical, spatial, kinesthetic, interpersonal, and perhaps even intrapersonal (Gardner, 1985). In a classic study of creativity, Taylor (1959) proposed the existence of five typologies for creativity. These were expressive, productive, inventive, innovative, and emergenative.

Expressive creativity is the type of spontaneous creativity often seen in children and is exemplified in drawings and play. Productive creativity is illustrated by scientists and artists. An element of spontaneous production remains, yet is characterized by the need to create rather being restricted by the need to express. The third classification is inventive creativity that may be described as a problem solving or a creation to improve an existing technology. An example would be an engine invented to make farm tractors more fuel efficient. Innovative creativity deals with the capacity to improve or reinvent an existing organism or object through the utilization of conceptualization skills. An example is the recent movement to reinvent government, in which the existing governmental structure was redefined through reconceptualization. The final type of creative skill is emergenative. It is a new creation opening an entirely new paradigm. An example is the interventions of chemical fertilizers, insecticides, and hybrid seeds that helped to launch the Green Revolution. Emergenative creativity is a discovery that opens an explosion of ideas in a synergetic fashion (Taylor, 1959).

In an operationally problem-oriented definition, Torrance (1966) defined creativity as:

> A process of becoming sensitive to a problem, deficiencies, gaps in knowledge, missing elements, disharmonies, and so on; identifying the difficulty; searching for solutions, making guesses, or formulating hypothesis about these deficiencies; testing and retesting these hypotheses and possibly modifying and retesting them; and finally communicating the results. (p. 6)

Figure 1 presents forces and factors in the creative thinking process model. This model is one cycle that consists of three distinct phases: (1) an initial catalyst; (2) a gestation period; and (3) a problem solution and verification phase. In one's reality, any problem experienced in his/her livelihood system or expressive creative "seed" could serve as an initial catalyst (Wells, 1984). After the initial catalyst, there is a gestation period where one begins to delineate the problem that he/she wishes to solve. Finally there is a problem solution and verification process in which the individual comes up with a proposed resolution or creation which he or she then tests (Wells, 1984).

The gestation phase includes four groups of often overlapping catalysts/inhibitors of creativity. These are encountered throughout life and either stimulate and/or limit one's capacity to be creative. The first group of catalysts and inhibitors of creativity consists of interpersonal variables that Krippner (1991) defined as family, peers, and authorities. These relationships help to shape the cognitive, behavioral, and attitudinal components of attitudes and are seen as catalysts and/or inhibitors depending on the manner in which they impact the individual.

Wright (1987) listed the factors that influence a creative home environment as “respect for the child, the stimulation of independence and enriched learning environment" (p. 34). Pratt-Summers (1989) found similar results to the one described above. Jausovoc (1988) and Dorner (1979) discovered that the teacher's teaching style (based on Piagtian cognitive theory: exercise training, tactical training, and strategic training) was related to the development of creativity in students. These results support the notion that interpersonal variables are important catalysts and/or inhibitors of creativity.

The second group of catalysts and inhibitors consists of biological variables such as age, genetics, health status, and gender (Krippner, 1991). The majority of the research has been concentrated on gender and birth order. There is not a consensus on the impact of gender upon creativity. Torrance (1983) wrote, "a substantial body of evidence indicates that males and females perform at similar levels of tests designed to measure creative potential" (p. 134). He found that girls did not perceive themselves to be inventors and were largely influenced by their environment. Harriss (1989) found that women were discouraged from becoming artists. Torrance and Allioti (1969) discovered that 13 year old girls had higher verbal creative ability compared to boys of the same age. Gupta (1979) did not find that there was a significant difference between boys and girls in verbal creative ability, but found that there were distinct elements of non-verbal ability in which each scored significantly higher. The research on the impact of birth order has detected that first born males and females scored significantly higher on creativity tests than the second born (Comeau, 1980; Jaraial, 1985). The unique contribution of age, genetics, and health status to creativity is unclear.

The third catalysts/inhibitors group is cultural variables. Krippner (1991) defined these as socio-economic status, ethnic background, religious experience, and significant emotional events. There is a wealth of research to support the connection between socioeconomic status and creativity (Forman, 1979; Cicirelli, 1966; Singh, 1970; Kaltounis, 1974; and Torrance, 1963). The exception to this was discovered by Warden and Pratt (1971) who found no division in creativity between any ethnic or social class.

Cultural background was found to have an impact upon creativity of individuals from Japan (Torrance & Sato, 1979), India (Sharma & Naruka, 1983; Torrance, 1981), the United States, Western Australia, Western Somoa, Germany, (Torrance, 1981) and the Dominican Republic (Baker, Rudd, & Pomeroy, 2000). Sharma and Naruka (1983) found a creative difference between the Hindu, Muslim, and Christian religious groups in India.

Torrance (1986) suggested the way that significant emotional events may affect creative expression when he wrote: "apparently, an intense emotional experience sets up a need for creative expression and actually facilitates the creative expression" (p. 130). Significant emotional events such as divorce, death of a loved one, or personal illness often force the individual into a state of deep reflection of the core inhibitors/catalysts which influence creative attributes. Significant emotional events at the societal level such as war, famine, or political instability can also influence individuals. Torrance (1986) reviewed events such as the Challenger accident and then discussed the outpouring of drawings, poems, etc. Similar events have been recently witnessed in regards to the tragic death of John F. Kennedy, Jr.

The final group of catalysts and inhibitors consists of personal attributes/educational factors. These include learning style, critical thinking, knowledge, motivation, creative response style, and educational setting. Isaacs (1987) examined the importance of learning style and its impact on creativity when she stated:

> In some ways creativity is as delicate as the very breath of life. It can be nurtured and expended, or starved and diminished. Thus understanding and applying findings from learning style study is as important for sustaining creativity as for stimulating academic achievement. (p.257)

<u>Understanding the manner in which the individual learns facilitates academic achievement and can lead to an environment, which enhances creativity.</u>

In discussing the impact of knowledge on creativity, Sternberg and Luppart (1991) made the distinction between knowledge and usable knowledge. They stated: “knowledge can be learned in a way that makes it inert" (p. 610). These researchers felt that students have often been taught information without understanding its application. They stressed the importance of usable knowledge when they stated: “if we want students to be creative, we have to model creativity for them, and we won’t be able to do that if we seek to turn students’ minds into safe-deposit boxes in which to store our assorted and often indigestible bits of knowledge" (p. 611). Learner construction of knowledge is an important element for the development of creativity.

Sternberg and Luppart (1991), when discussing the importance of motivation, identified two key types: Intrinsic motivation and the motivation to excel. Intrinsic motivation was seen as an important element because students are much more likely to be creative if they enjoy what they are doing. Motivation to excel has been emphasized because these individuals are willing to work for creative excellence.

Gelade (1995) and Haley (1983) proposed the idea of creative response styles. Haley (1983) defined three types of creative styles: verbal, kinetic, and integrative, in response to an open-ended problem. The verbal style used words and sounds in its expression. An example of this style would be a child that writes a poem. Haley (1983) stated that: “demonstrating problem solution defines a kinetic mode" (p. 25). The use of both verbal and kinetic styles demonstrates an integrative creative reponse style. Haley (1983) reported that kinetic style was associated with socio-economic status. Middle and upper class learners used more kinetic responses while lower class learners used more verbal responses.

In the book <u>The Nature of Creativity</u> (1997) Torrance reviewed experiments that examined the effects of educational setting upon creativity. The majority of the research (Boersman & O’Bryan , 1968; Moham, 1970; Hooper & Powell, 1971; Nash, 1971; Ward, 1969; Norton , 1971; Khatena, 1971; Kogan & Morgan, 1969) found that there was a difference in creativity when the school environment (testing conditions, cue rich and cue poor, etc.) was manipulated. These findings were in contrast to studies by Alliotti (1969) and Towell (1972) who did not find any differences in creativity based upon changes in educational environments.

The core of the gestation phase of the creative process model are the creative attributes referred to by Torrance, Orlow, and Safter (1990) as creative thinking abilities. These creative attributes were fluency, flexibility, originality, elaboration, abstractness of the title, resistance to closure, emotional expressiveness, articulateness, movement or action, expressiveness, synthesis or combination, unusual visualization, internal visualization, extending or breaking the boundaries, humor, richness of imagery, colorfulness of imagery, and fantasy. The Torrance Test of Creative Thinking (TTCT) is an instrument that can be used to operationalize these creative attributes. According to Torrance, et al., (1990):

The term "creative thinking abilities" as used in the TTCT, refers to that constellation of generalized mental abilities that is commonly presumed to be brought into play in creative achievements. . . The author has maintained that high degrees of the abilities measured by tests such as the TTCT increase the chances that the possessor will behave creatively. Certainly, the author of these tests would never argue that possession of these abilities guarantees that an individual will behave creatively, any more than a high degree of intelligence guarantees intelligent behavior. . . Creative motivations and skills, as well as abilities, are necessary for adult creative achievement. (p. 1)

This process may or may not be linear. Each iteration is different in time and shape, depending on its interaction with the other catalysts and inhibitors described in the model. It is even possible that a full iteration may not be completed because of factors such as motivation.

The final phase of this model results in an end product and verification of creativity that is expressive in problem solution and verification for the typologies (of creativity) proposed by Taylor (1958). However, it is important to point out that there is a very important time dimension to creativity. The time dimension is influenced by the perceived importance of the problem, as well as the motivation, support, and resources available for problem resolution. Wells (1984) suggested that the creative process involved four steps (initial catalyst, gestation, problem solution, and verification) and would take place over a period of time. The authors propose that creativity is directly correlated to the availability of time, motivation, support, and resources. The steps are repeated in iterations as the individual attempts to solve the problem and/or utilize the stimuli. This process may or may not be linear. Each iteration is different in time and shape, depending on its interaction with the other catalysts and inhibitors described in the model. Often a full iteration may not be completed because of factors such as low motivation.

Conclusions/Recommendations

It is the desire of the authors to stimulate further discussion, thought, and scholarship on the creative potential in higher education. The W. K. Kellogg Foundation (1999) warned that "higher education is no longer the leader in society that most higher education personnel think it is" (p.1). The authors suggest that agricultural faculty in higher education programs utilize the contents of this article as a foundation for the encouragement of a “creative” dialogue with stakeholders. Clearly the exciting changes and opportunities that we face in agricultural education deserve our most creative thought in the strategic planning process.

In terms of instructional delivery, Freire and Macedo (1998) indicated that effective instruction is based upon the teacher's ability to think creatively. Anderson (1990) further explored the importance of creativity in higher education when he wrote:

> The college experience should include an opportunity to discover one's potential and achieve higher levels of creative expression. The extent to which this happens depends on curriculum and the commitment of the faculty members to nurture this development both inside and outside of the classroom. The learning environment as reflected by the classroom and campus setting, supportive extra-curricular and the advisor/ student relationship all impact the total educational mission of developing creativity. (p. 55)

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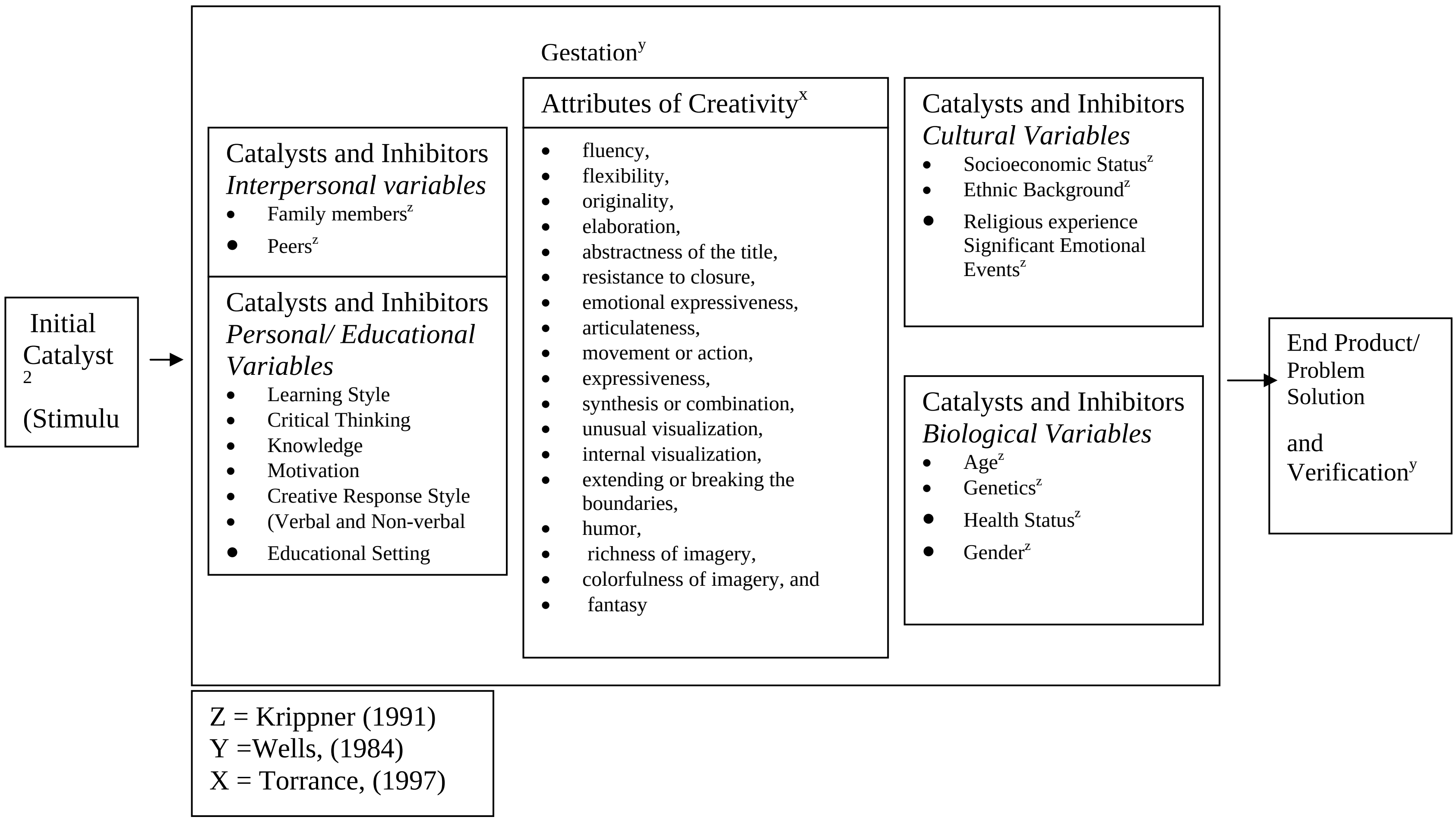

Figure 1.*Creative thinking process model*

Relationships between Critical and Creative Thinking

Matt Baker
Texas Tech University

Rick Rudd
Carol Pomeroy
University of Florida

Introduction

> *Whereas creative thinking is divergent, critical thinking is convergent; whereas creative thinking tries to create something new, critical thinking seeks to assess worth or validity in something that exists; whereas creative thinking is carried on by violating accepted principles, critical thinking is carried on by applying accepted principles. Although creative and critical thinking may very well be different sides of the same coin they are not identical. (Beyer, 1989; p.35)*

Creative and critical thinking skills are considered essential for students (Crane, 1983). Crane (1983) expressed the importance of both of these skills when she wrote: "When reasoning fails, Imagination saves you! When Intuition fails, reason saves you!"(p. 7). There has been an abundance of research on each construct but very little examining if they are related. Scriven (1979) stated: "Critical skills go hand in hand with creative ones" (p. 37). Only by understanding if there is a relationship between these two essential constructs will educators be able to enhance the capacity of their students to utilize both creative and critical thinking. It is essential to first define each of these constructs to determine if indeed they are correlated.

Theoretical Framework

Critical Thinking

Critical thinking is a common "buzz phrase" in educational, psychological, and philosophical, circles today. Much work has been completed in the name of critical thinking in education to date that not only leaves one wondering how it is measured, but also leaves one groping for a cognizant definition of critical thinking. Part of this ambiguity lies in the existence of multiple definitions for critical thinking.

Halpern (1996 p.5) defines critical thinking as "…the use of cognitive skills or strategies that increase the probability of a desirable outcome." Other definitions include: the formation of logical inferences (Simon & Kaplan, 1989), developing careful and logical reasoning (Stahl & Stahl, 1991), deciding what action to take or what to believe through reasonable reflective thinking (Ennis, 1991), and purposeful determination of whether to accept, reject, or suspend judgment (Moore & Parker, 1994). In a comprehensive attempt to define critical thinking, Pascarella and Terenzini (1991) compiled the following, "…critical thinking has been defined and measured in a number of ways but typically involves the individual's ability to do some or all of the following: identify central issues and assumptions in an argument, recognize important relationships, make correct inferences from data, deduce conclusions from information or data provided, interpret whether conclusions are warranted on the basis of the data given, and evaluate evidence or authority: (p. 118).

Burden and Byrd (1994) categorize critical thinking as a higher-order thinking activity that requires a set of cognitive skills. In a 1987 comprehensive review of existing literature, Beyer posited that critical thinking requires a set of skills and approaches to be effective. Beyer's critical thinking skills include:

1. Distinguishing between verifiable facts and value claims
2. Distinguishing relevant from irrelevant information, claims, and reasons
3. Determining factual accuracy of a statement
4. Determining credibility of a source
5. Identifying ambiguous claims or arguments
6. Identifying unstated assumptions
7. Detecting bias
8. Identifying logical fallacies
9. Recognizing logical inconsistencies in a line of reasoning
10. Determining the strength of an argument or claim

In an effort to clarify the process of critical thinking, Paul (1995) wrote that critical thinking is a unique and purposeful form of thinking that is practiced systematically and purposefully. The thinker imposes standards and criteria on the thinking process and uses them to construct thinking.

Paul (1995) further refined critical thinking by identifying three thought traits and/or processes possessed by the critical thinker. They are elements of reasoning, traits of reasoning, and reasoning standards.

Elements of reasoning consist of seven components that help guide the reasoning process. These components include the purpose of the thinking or the question at hand, information and/or facts about the question, assumptions made about the question, interpretation of the facts and data collected, theories and concepts related to the question, and inclusion of other points of view. Finally, an assessment of the conclusions is drawn with emphasis on implications and consequences of the decisions reached as a result of the thinking process (Figure 1).

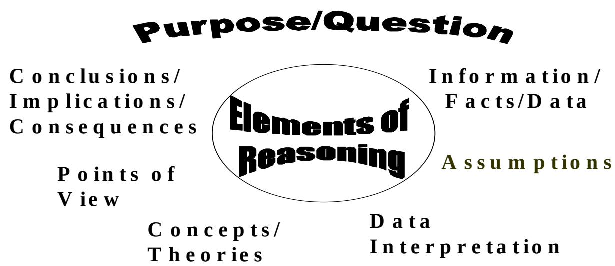

Figure 1: Elements of Reasoning

Traits of critical thinkers include independent thinking, intellectual empathy, intellectual humility, courage, integrity, perseverance, intellectual curiosity, faith in reason, intellectual civility, and intellectual responsibility. These traits are not only present in critical thinkers, they are consciously utilized to guide the thinking process (Paul, 1995).

Rudd, Baker, Hoover, and Gregg (1999) offered the following definition:

> Critical thinking is a reasoned, purposive, and introspective approach to solving problems or addressing questions, with incomplete evidence and information, and for which an incontrovertible solution is unlikely.

Creative Thinking

Creativity is a complex construct and is most commonly expressed through a broad range of intelligences including linguistic, musical, mathematical, spatial, kinesthetic, interpersonal, and perhaps even intrapersonal (Gardner, 1985). In a classic study of creativity, Taylor (1959) proposed the existence of five typologies for creativity. These were expressive, productive, inventive, innovative, and emergenative.

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Figure 2 presents forces and factors in the creative thinking process model. This model is one cycle that consists of three distinct phases: (1) an initial catalyst; (2) a gestation period; and (3) a problem solution and verification phase. In one’s reality, any problem experienced in his/her livelihood system or expressive creative "seed" could serve as an initial catalyst (Wells, 1984). After the initial catalyst, there is a gestation period where one begins to delineate the problem that he/she wishes to solve. Finally there is a problem solution and verification process in which the individual comes up with a proposed resolution or creation which he or she then tests (Wells, 1984).

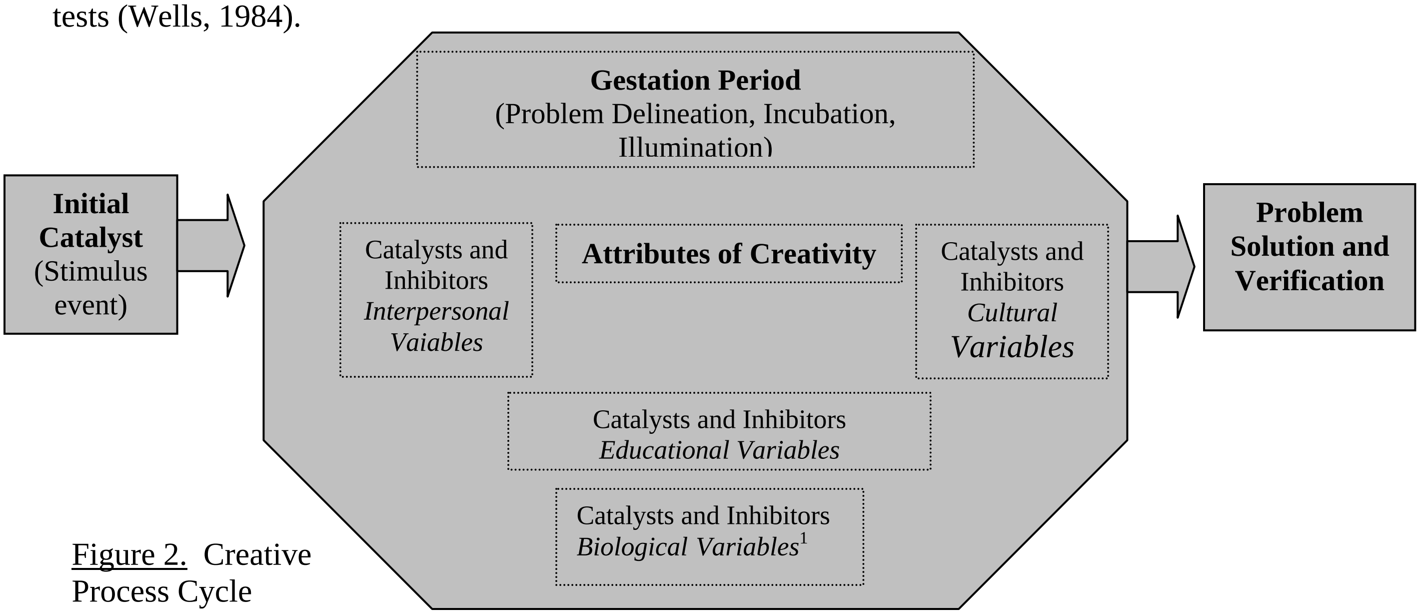

Figure 2. Creative Process Cycle

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> In some ways creativity is as delicate as the very breath of life. It can be nurtured and expended, or starved and diminished. Thus understanding and applying findings from learning style study is as important for sustaining creativity as for stimulating academic achievement. (p.257)

Understanding the manner in which the individual learns facilitates academic achievement and can lead to an environment that enhances creativity.

In discussing the impact of knowledge on creativity Sternberg and Luppart (1991) made the distinction between knowledge and usable knowledge. They stated: "knowledge can be learned in a way that makes it inert" (p. 610). Sternberg and Luppart (1991), when discussing the importance of motivation, identified two key types: Intrinsic motivation and the motivation to excel. Intrinsic motivation was seen as an important element because students are much more likely to be creative if they enjoy what they are doing. Motivation to excel has been emphasized because these individuals are willing to work for creative excellence.

In the book The Nature of Creativity (1997) Torrance reviewed experiments that examined the effects of educational setting upon creativity. The majority of the research (Boersman and O'Bryan , 1968; Moham, 1970; Hooper and Powell, 1971; Nash, 1971; Ward, 1969; Norton , 1971; Khatena, 1971; and Kogan and Morgan, 1969) found that there was a difference in creativity when the school environment (testing conditions, cue rich and cue poor, etc.) was manipulated. These findings were in contrast to studies by Alliotti (1969) and Towell (1972) who did not find any differences in creativity based upon changes in educational environments.

The core of the gestation phase of the creative process model is the creative attributes referred to by Torrance et al. (1990) as creative thinking abilities. These creative attributes were fluency, flexibility, originality, elaboration, abstractness of the title, resistance to closure, emotional expressiveness, articulateness, movement or action, expressiveness, synthesis or combination, unusual visualization, internal visualization, extending or breaking the boundaries, humor, richness of imagery, colorfulness of imagery, and fantasy. The Torrance Test of Creative Thinking (TTCT) is an instrument that can be used to operationalize these creative attributes.

This process may or may not be linear. Each iteration is different in time and shape, depending on its interaction with the other catalysts and inhibitors described in the model. It is even possible that a full iteration may not be completed because of factors such as motivation. The final phase of this model results in an end product and verification of creativity that is expressive in problem solution and verification for the typologies (of creativity) proposed by Taylor (1958). However it is important to point out that there is a very important time dimension to creativity. The time dimension is influenced by the perceived importance of the problem, as well as the motivation, support, and resources available for problem resolution.

Purpose

The purpose of this study was to explore the relationships between creative thinking abilities and critical thinking disposition. The specific objectives of the study were: (1) to describe the students in terms of academic classification, creative thinking abilities, and critical thinking disposition; (2) to determine the amount of variance in creative thinking ability explained by critical thinking disposition; and to (3) determine the relationship between creative thinking ability and gender.

Methodology

A purposive sample consisting of students in a senior level project planning and evaluation course (n=32) and two instructional methods courses (n=4) and (n=14). Data were collected spring, summer, and fall semesters of 1999.

The researchers utilized two instruments for data collection. First, the Torrance Test for Creative Thinking – Form A (TTCT) was utilized to measure creative attributes. For this three-part timed test, subjects are asked to construct a picture, complete a series of incomplete drawings, and complete drawings from sets of parallel lines. According to Torrance et al., 1990:

> The term "creative thinking abilities" as used in the TTCT, refers to that constellation of generalized mental abilities that is commonly presumed to be brought into play in creative achievements. . . The author has maintained that high degrees of the abilities measured by tests such as the TTCT increase the chances that the possessor will behave creatively. Certainly, the author of these tests would never argue that possession of these abilities guarantees that an individual will behave creatively, any more than a high degree of intelligence guarantees intelligent behavior. . . Creative motivations and skills, as well as abilities, are necessary for adult creative achievement." (p. 1)

The TTCT results in quantitative scores for the following norm-referenced constructs: (1) fluency – the ability to produce a large number of figural images; (2) originality – unusualness or rarity of response; (3) abstractness – the ability to produce good titles and to capture the essence of information involved; (4) elaboration – ability to develop, embroider, embellish, carry out, or otherwise elaborate ideas; and (5) resistance to premature closure – the ability to keep a figure open and delay closure long enough to make the mental leap that makes original ideas possible. Content and construct validity has been established by the TTCT developer (Torrance et al., 1990). Intra-rater reliability coefficients are above the .90 level (Torrance et al., 1990). In addition to the TTCT, the researchers recorded the subjects' academic rank and gender.

The California Critical Thinking Disposition Inventory (CCTDI) was the second instrument utilized. The test consists of 75 Likert-type questions that represent 7 critical thinking constructs (see Table 1). Content and construct validity has been established by CCTDI developers (Facione, Facione, & Giancarlo, 1996). The developers report an overall reliability (Cronbach's α) of .90 and scale reliability scored from .72 - .80. Total scores range form 75-450.

The following descriptions of the CCTDI constructs are from the CCTDI test manual (Facione, Facione, & Giancarlo, 1996).

Analyticity is a construct consisting of 11 items from the CCTDI. This construct targets the disposition of being alert to potentially problematic situations, anticipating possible results or consequences, and prizing the application of reason and the use of evidence even if the problem at hand turns out to be challenging or difficult. The analytically inclined person is alert to potential difficulties, either conceptual or behavior, and consistently looks to anticipatory intervention, reason giving, and fact-finding as effective ways to resolve matters.

Self-confidence is a construct consisting of 9 items from the CCTDI. This construct refers to the level of trust one places in one's own reasoning process. Critically thinking, self-confident persons trust themselves to make good judgments and believe that others trust them as well, since they believe that others look to them to resolve problems, decide what to do, and bring reasonable closure to inquiry.

Inquisitiveness is a construct consisting of 10 items from the CCTDI. The inquisitive person is one who values being well informed, wants to know how things work, and values learning even if the immediate payoff is not directly evident.

Maturity is a construct consisting of 10 items from the CCTDI. The maturity scale addresses cognitive maturity and epistemic development. CCTDI scoring gives preference to those disposed to approach problems, inquiry, and decision making with a sense that some problems are ill-structured, some situations admit of more than one plausible option, and many times judgments based on standards, contexts, and evidence which precludes certainty must be made.

Open-mindedness is a construct consisting of 12 items from the CCTDI. This construct targets the disposition of being open-minded and tolerant of divergent views with sensitivity to the possibility of one's own bias. The open-minded person respects the rights of others to holding differing opinions.

Systematicity is a construct consisting of 11 items from the CCTDI, targeting the disposition to being organized, orderly, focused, and diligent in inquiry. No particular kind of organization, e.g. linear or nonlinear, is given priority on the CCTDI. The systematic person strives to approach specific issues, questions or problems in an orderly, focused, and diligent way, however that might be accomplished.

Truth-seeking is a construct consisting of 12 items from the CCTDI, representative of those eager to seek the truth, who are courageous about asking questions, and honest and objective about pursuing inquiry even if the findings do not support one's interests or one's preconceived opinions. The truth-seeker would rather pursue the truth than win the argument.

Total Score is a measure consisting of the 75 items from the CCTDI.

The CCTDI is used extensively in military science, law enforcement, allied health, engineering, and business. Although the researchers did not find evidence of CCTDI use in agriculture, the instrument was deemed appropriate for the purpose of identifying agriculture student's disposition to think critically (Facione, Facione, & Giancarlo, 1996).

The data were analyzed by using SPSS/7.5 for Windows software. Descriptive statistics, multiple linear regression and point biserial correlational analysis was used to summarize and analyze the data.

Results

Objective number one was to describe the students in terms of academic classification, creative thinking abilities, and critical thinking disposition. Sixty-two percent of the students in the sample were female, and 74% were classified as a senior. Approximately 12% of the students were juniors, and ten percent were classified as post-baccalaureate students.

In terms of creative thinking ability, TTCT percentile scores were calculated from the raw scores based upon the adult population in the U.S. The students ranked in the 58th percentile in fluency; 75th percentile in abstractness; 51st percentile in originality; 46th percentile in elaboration; and 64th percentile in their resistance to premature closure.

Clearly the percentile scores reflect an average ability in fluency, originality, elaboration, and resistance to premature closure. The students had a greater ability to produce good titles and to capture the essence of information involved when compared to the general adult population.

In terms of the critical thinking disposition, the CCTDI consists of seven sub-scales or constructs and an overall CCTDI Total Score. The recommended cut score for each scale or construct is 40 and the suggested target score is 50. All scores range up to 60. Persons who score below 40 on a given scale are weak in that critical thinking dispositional aspect, persons who score above 50 on a scale are strong in that dispositional aspect. In recording a 50, a person is demonstrating consistent strength in that dispositional aspect. Inversely, scoring below 40 indicates that, on average, the person responds in opposition to the critical thinking dispositional aspect measured by a given scale.

On six of the seven subscales, students in this sample could not be described as being particularly strong or weak (Open-mindedness - M=44.88, SD=5.39; Inquisitiveness - M=45.64, SD=6.28; Systematicity - M=42.33, SD=5.71; Maturity - M=45.92, SD= 6.41; Self-confidence - M=43.26, SD=5.73; Analyticity - M=44.13, SD=5.48). On the construct of Truth-seeking, they could be described as slightly weak (M=39.10, SD=7.01).

Just as scores of less than 40 shows weakness, an overall CCTDI score of less than 280 shows serious overall deficiency in the disposition toward critical thinking. An overall score of 350 or more is a solid indication of across the board strength in the disposition toward critical thinking. However, an overall score of 350 is rare. People tend to have both strengths and weaknesses. The overall CCTDI score for this sample was 305.25 (SD=27.91).

The second research objective was to determine the amount of variance in creative thinking ability explained by critical thinking disposition. Five multiple linear regression analyses were utilized, with raw TTCT scores as the dependent variable, and CCTDI subscales as the independent variables. Although none of the analyses were statistically significant, critical thinking disposition accounted for 24% of the variance in resistance to premature closure ($F=1.96$, $p=.08$), 5% of the variance on fluency ($F=.35$, $p=.93$), 8% of the variance on abstractness ($F=.55$, $p=.78$); 2% on originality ($F=.49$, $p=.83$); and 1% on elaboration ($F=.06$, $p=.99$).

The final research objective was to examine the relationships between creative thinking ability and gender. Low to negligible (Davis, 1971) bivariate relationships were found between gender and resistance to premature closure ($r=.07$), fluency ($r=-.03$), abstractness ($r=.24$), originality ($r=-.11$), and elaboration ($r=.15$).

Conclusion and Implications

It appears that the collegiate educational experience has had little effect upon the students' ability to be creative or their disposition to think critically. Teaching students to remember factual information and return it in the form of an examination is the prevalent teaching mode employed in secondary and post-secondary institutions today. Teaching thinking skills is a difficult and much different endeavor. Teaching to promote thinking takes more time to prepare, is difficult to plan, and limits the amount of content "taught." Teachers can no longer be information givers. Students must learn thinking and reasoning skills to reach their fullest potential in today's society (Meyers, 1986).

The "more information is better" attitude unfortunately prevails in modern education. This is unfortunate considering that often the factual matter has a relatively short life span with students (Terezini, Springer, Pascarella, & Nora, 1993). When coupled with the fact that information learned today quickly becomes outdated, is it any wonder that our students struggle when they reach the work place? Good thinking skills will not develop on their own, they must be taught (Beyer, 1987). Teaching students to think must be a priority of our schools today. In any thought process we engage in both critical and creative thinking (Beyer, 1987).

The term critical thinking is common in educational, psychological, and philosophical circles today. Employers, parents, administrators, and students themselves want critical thinking skills developed in today's graduate. Developing critical thinking skills is not a new idea. Osborne (1932, p.402) stated that, "…it is assumed that development of thought power is one of the major aims of education." Dressel and Mayhew (1954) believed that educational institutions were responsible for teaching students to go beyond the simple mental activities of recall and restatement of ideas and facts to the higher-level skills and habits involved in critical thinking.

Anderson (1990) explored the importance of creativity in higher education when he wrote:

The college experience should include an opportunity to discover one's potential and achieve higher levels of creative expression. The extent to which this happens depends on curriculum and the commitment of the faculty members to nurture this development both inside and outside of the classroom. The learning environment as reflected by the classroom and campus setting, supportive extra-curricular and the advisor/student relationship all impact the total educational mission of developing creativity. (p. 55)

Sutton and de Oliveira (1995) asserted that although students complete basic courses they have only a superficial understanding of what they have learned. In fact, few students are taught the skills needed to examine principles, values and facts.

This study was limited to the groups that participated. The results from this study suggest that the two constructs (critical and creative thinking) are not closely connected. These researchers emphasize that much more research needs to be conducted with different age ranges, gender, and socio-economic background to confirm the results of this study. This research should help to answer very important questions on how to enhance the capacity of students to critically and creatively think. The preliminary findings in this study suggest that educators must prepare specific curriculum that stimulates creative and critical thinking separately.

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Peer Evaluation of Teaching in University of Florida's College of Agricultural and Life Sciences

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Abstract

This five-year follow up study was conducted to assess the peer evaluation process in the University of Florida College of Agricultural and Life Sciences. The long-interview process was used with faculty who were peer evaluated, faculty who chaired peer evaluation committees, and administrators who interpreted the results of the peer evaluations. Content analysis was used to interpret the interviews. Results of the interviews were triangulated to identify common themes among the groups involved in the process. The interviewees cited the time necessary to complete the peer review process and the reluctance of peer evaluation committee members to include less than positive feedback in the final report as shortcomings of the process. However, the three groups agreed that peer evaluation has improved teaching, and recommended that peer evaluation be continued in the College of Agricultural and Life Sciences at the University of Florida.

Introduction

Land grant institutions in the United States have included teaching as a component of their tripartite mission (research, teaching, and extension) since their inception. Until recent years, however, excellence in teaching has seldom been rewarded. Due to public perceptions of poor teaching and pressure from state and federal government leaders, the teaching role at universities has been magnified (Rudd, Baker, Hoover, 1996). Universities are struggling to identify and reward good teaching.

Although student evaluations of teaching are both praised and criticized, assessing teaching effectiveness is largely accomplished through this means (Keig & Waggoner, 1994). Soderberg (1986) stated that when evaluating teachers at the delivery phase of instruction, students are the most qualified to accomplish this task (1986). On the other hand, students may not be qualified to assess teaching during revision and pre-interactive phases (Keig and Waggoner, 1994). Therefore, student evaluations, while they do contribute information on teacher effectiveness, may not provide a complete portrait of all aspects of teacher performance.

Kronk and Shipka (1980) define evaluation as "appraising the quality, worth, or effectiveness of an individual's work" (p.7). Peers, students, administrators, or the faculty members themselves may conduct the evaluation. Willerman, McNeely, and Koffman (1991) refer to a process of peer observation and assistance as a method of one teacher helping another teacher to improve his or her classroom performance. Keig and Waggoner (1994), define peer evaluation as "a process in which faculty work collaboratively to assess each others' teaching and to assist one another in efforts to strengthen teaching" (p. iii). According to Lieberman (1998), peer evaluation is understood to include all procedures used by teachers to improve teacher performance and to terminate teachers who are not performing adequately after receiving this assistance.

Teacher evaluations are important, because they are a major consideration for promotion and tenure decisions (Osborne, 1998). Although student evaluations are still the main data source for evaluating teaching, the use of peer evaluations is growing (Osborne, 1998). More universities are incorporating peer evaluation as evidence in faculty evaluation. Centra (1979) stressed the importance of peer evaluation in assessing teaching, because it provides a different perspective than that of the student or supervisor for evaluation. "Faculty can evaluate their colleagues' performance at three stages of instruction: pre-interaction, delivery, and post-interaction" (Keig and Waggoner, 1994). They can also define relationships among these stages and the following processes: goals and objectives, methods and materials, and feedback. (Soderberg, 1986).

Keig and Waggoner (1994) argue that faculty evaluations are an important part of improving teaching. Successful teaching requires more than just a knowledge of the subject matter; it requires knowledge of learning theories and teaching strategies, dedication to students' advancement, awareness of the environment in which teaching and learning occurs, and concern about their teaching as well as their colleagues' (Keig and Waggoner, 1994). Gould (1991) concluded that peer evaluation, student evaluations, and self-evaluations are all valid forms of assessment and all have strengths and weaknesses.

Peer Evaluation at Other Institutions

The University of Kentucky Community College System (UKCCS) implemented a Teacher Consultation Program (TCP) in 1977 (Kerwin and Rhoads, 1996). A study conducted over three semesters within the UKCCS system, showed that faculty who participated in the TCP raised their student evaluations significantly when compared to the control group of faculty who did not participate in the program (Kerwin and Rhoads, 1996). One semester after participation, those instructors still had higher ratings on student evaluations. In addition, participating instructors applauded the program as being helpful to them as instructors (Kerwin and Rhoads, 1996).

The peer review committee at the University of Tennessee, Knoxville, made the comment in its 1987 final report that peer evaluation should be used to evaluate the faculty member's knowledge of the subject, course objectives, assignments, examinations, and contribution to the departmental teaching efforts (Bell and McClam, 1992). The University of Tennessee peer evaluation process included the participation of the instructor being evaluated by collecting a variety of course material including syllabi, assignments, tests, and written materials. The review team (consisting of a three-member group of tenured faculty) evaluated the portfolio and provided a written summary of the evaluation to the instructor. Other types of evaluation (such as classroom visitation) were optional and each department decided what would be appropriate for faculty within the unit (Bell and McClam, 1992).

Peer Evaluation at the University of Florida

In 1993, the University of Florida Teaching Improvement Committee recommended to President John Lombardi that colleges and departments within the university develop mechanisms for extensive documentation of instructional quality by adopting the use of teaching portfolios. Once implemented, this system would provide a diversity of information for teaching quality evaluation for the purposes of teaching recognition, improvement, and tenure and promotion decisions (Connor, 1994).

In July 1994, the College of Agricultural and Life Sciences faculty voted to include peer evaluation as a required and essential component for tenure and promotion. The original purpose of peer evaluation was to improve teaching and to provide input about the quality of teaching. The College of Agricultural and Life Sciences called on the UF/IFAS Teaching Resource Center (TRC), located in the Department of Agricultural Education and Communication to develop a suggested plan for conducting peer evaluations. The suggested plan was based upon models from the University of Nebraska - Lincoln, the University of Kentucky, and the University of Tennessee - Knoxville. Based on the review of peer evaluation policies from other institutions of higher education, Rudd, Baker and Hoover (1994) identified three areas of concentration for review in the peer evaluation process. The areas reviewed were classroom instruction, curriculum development and improvement, and course development and improvement. Although the TRC developed suggested guidelines for the College, each department developed their own peer evaluation policies. Departments were encouraged but not required to use the TRC format. The College of Agricultural and Life Sciences made further revisions to the process in 1997 by reducing the number of peer evaluations for promotion and tenure decisions.

In general, the peer evaluation process in the College of Agricultural and Life Sciences at the University of Florida is structured as follows. When a faculty member desires to be peer evaluated, the peer evaluation is scheduled through the department chair. The faculty member decides the course to be evaluated. The peer evaluation is scheduled to allow committee members to observe the course for one semester. The committee is usually composed of three faculty members. It is recommended that one member be selected by the faculty member being evaluated, one by the department chair, and one jointly. Typically, one member of the committee comes from another department. The department chair selects the peer evaluation committee chair from among the members of the committee.

Faculty members in line for promotion and /or tenure are required to be peer reviewed, at least once before the promotion and/or tenure decision. A faculty member may elect to be peer reviewed more than once. In addition to promotion and tenure decisions, teaching awards in the college require a peer evaluation of the faculty member in order to be considered for recognition. The teaching awards range from teacher of the year recognition to the Teaching Incentive Program (TIP) awards that add $5,000 to a faculty members’ base salary.

Problem

The use of peer evaluation has grown in popularity and it is widely used to help administrators assess faculty teaching. This evaluation method has been widely employed to make promotion and tenure decisions as well as to decide faculty merit in teaching programs. Although the use of this methodology is increasing, little has been done to assess the effectiveness of peer evaluation.

The purpose of this study was to critically examine the peer evaluation process in the University of Florida’s College of Agricultural and Life Sciences and to determine the effectiveness of peer evaluation over the last five years in the opinions of the department chairs, peer evaluation committee chairs, and the faculty who were peer evaluated. The following objectives guided this study:

1. Determine the perceptions of department chairs toward the peer evaluation process

2. Determine the perceptions of peer evaluation committee chairs toward the peer evaluation process

3. Determine the perceptions of faculty who were peer evaluated toward the peer evaluation process

4. Determine common themes among department chairs, peer evaluation committee chairs, and peer evaluated faculty in their assessment of the peer evaluation process.

Methodology

This study was descriptive and qualitative in nature, utilizing the structured long interview process (McCracken, 1988). The final interview questionnaire consisted of 8 questions. Faculty in the Department of Agricultural Education and Communication reviewed the instrument for trustworthiness. The interview questionnaire was pilot tested with a group of faculty representing those who were peer evaluated, those who chaired peer evaluation committees, and department chairs. As a result of the pilot test the interview questionnaire was slightly modified. The interviews were completed by the researchers. To ensure consistency in the interview process, the interviewers were trained by the lead researcher.

The goal of this qualitative study was not to produce a standardized set of results but rather to produce a coherent description of the status of peer evaluation in the College of Agricultural and Life Sciences at the University of Florida.

The target population was all University of Florida, Institute of Food and Agricultural Sciences (UF/IFAS) College of Agricultural and Life Sciences Departments (17). Interviews were conducted with Department Chairs from each department in the College, a chair of a peer evaluation committee from each Department, and a faculty member who was peer evaluated in each Department. A total of 45 out of the 51 selected chose to participate in the interview. Content analysis and triangulation were the methods of analysis used for the study.

Results

Perceptions of department chairs toward the peer evaluation process

According to one chair, "Peer evaluations are conducted to achieve and maintain excellence in teaching in academic programs, and for TIP awards, promotion and tenure," a sentiment echoed by many of the chairs. In fact, almost all of the department chairs interviewed indicated that peer evaluation is used primarily for promotion, tenure, and awards. Although not as prevalent, an additional theme suggested that the purpose of peer evaluation is to improve and maintain the quality and excellence of teaching. The chairs believed that teaching has improved in the college as a result of peer evaluation. The chairs cited that an unexpected side-benefit of peer evaluation was the peer evaluation committee learned from those being evaluated.

When questioned about key concepts that should be used as criteria in peer evaluation, department chairs generated a substantial list. Most chairs agreed that organization and preparedness were the most important criteria. The chairs stated that subject matter knowledge, current/appropriate curriculum, and course content are also important considerations for peer evaluation. Rapport with students, using a variety of teaching methods and clear/effective delivery were also viewed as components of good teaching. College department chairs cited student interest, and clear/fair expectations as factors that influence teaching.

Department Chairs believed that peer evaluation within IFAS is responsible for positive results including: instilling pride in teaching and increasing emphasis on teaching. As one chair stated, “You cannot attribute it all to peer evaluation, but in the last ten years teaching at the University of Florida has become very important.” Another chair stated that, “There has been a change in culture, teaching has become more important and peer review is a part of the return of pride and attention to teaching.” Yet another chair echoed “there is an emphasis on teaching, which we haven’t seen in years (which) is reinforced through peer evaluation. ”

Department chairs indicated that the time required to complete the peer evaluation process was the greatest barrier to conducting the evaluations. The department chairs also felt that committees were reluctant to share negative feedback for fear of damaging colleagues’ case for promotion, tenure and teaching awards. While some department chairs felt that peer evaluators may be too critical in their assessment of faculty this was not a major theme.

Several department chairs concurred with a colleague who suggested “the poorest teachers have not been evaluated”. There was a concern that the teaching faculty that needed the peer evaluation process the most were not being evaluated. In fact, department chairs believed that peer evaluation should be mandatory for all faculty members.

Department chairs indicated that the peer evaluation is but one evaluation tool they use in assessing faculty teaching. Student evaluations, teaching assistants, graduate and undergraduate coordinators are all considered additional sources of information to evaluate teaching.

Perceptions of peer evaluation committee chairs toward the peer evaluation process

The prevailing theme derived from those who chaired a peer evaluation committee suggested the main purpose for conducting peer evaluations was to provide evidence for promotion, tenure and awards. The committee chairs felt as if their job was to simply provide evidence for the promotion and tenure decision or teaching awards. “How can we improve the learning environment and (student) learning? This is not the ultimate goal of the process.” One committee chair said “Accountability” was the main role of the committee.

A smaller proportion of committee chairs indicated that the purpose for peer evaluation was to improve and maintain the quality and excellence in teaching. A major theme from this group was that the committees not only benefited by learning new techniques but also from exposure to unique ideas from those being evaluated. Committee chairs shared statements such as, “It is very unusual to see other faculty/your peers teach. This has improved my teaching;” “Committee participation makes you think about your own teaching;” and “peer evaluation forces folks to look at what they are doing.” Although teaching improvement was not considered the main purpose of peer evaluation among committee chairs, teaching improvement was thought to be the major benefit of the process.

The committee chairs identified five key concepts as important for evaluating teaching. The concepts identified were interaction with students, course content, course materials, clear/effective delivery, and clarity of presentation.

Committee chairs identified both the amount of time it takes to conduct a peer evaluation, and the reluctance to use negative feedback as major weaknesses of the peer evaluation process. One committee chair asked, “If they (evaluations) all come back glowing, is the process any good?” Another committee chair said, “Everyone does a great job in the classroom - the way they (evaluations) are used is not beneficial. Most of the constructive (negative) feedback is verbal.” Still another chair stated, “ There is a reluctance to put down negative comments on paper--you don’t get an honest report.”

A minor theme from the peer evaluation chairs was that peer evaluation committees feel that faculty do not know the science of teaching, and are not trained as teachers. Committee chairs believed that more pedagogical skill improvement was needed. One committee chair stated that, “Most faculty haven’t been educated and trained as teachers.”

One positive quality of peer evaluation identified by the chairs was that the process gave them the opportunity to provide feedback (both positive and negative). The committee chairs interviewed felt that teaching has improved and that teaching will continue to improve as a result of peer evaluation in the College of Agricultural and Life Sciences. One committee chair said that “There are a combination of things happening in the college-change of funding, renewed emphasis of the value of education and instruction, Professorial Excellence Program (PEP) and the Teaching Incentive Program (TIP) awards (both awards come with a substantial raise in the faculty members base salary): suddenly people see the value in teaching.”

Perceptions of faculty who were peer evaluated toward the peer evaluation process

Participants in the peer evaluation process believed that the feedback from peers was valuable. In particular, the faculty who were evaluated appreciated feedback from experienced members of the peer evaluation committee that helped them to improve teaching. A benefit,

according to one individual was that the evaluation included input by someone who has been recognized as a TIP award winner. As a whole, the faculty who were evaluated made changes to improve their teaching. Faculty shared comments such as, “(Peer evaluation) allowed me to see what the class looks like from another perspective,” and “Peer evaluation serves to enhance the learning environment for students.” Those evaluated viewed the purpose of peer evaluation as two-fold. First it provided input to improve and maintain the quality and excellence of teaching. Secondly, it provided evidence for promotion, tenure, and awards.

Faculty members who were evaluated believed the peer evaluation process has improved teaching in the college. One faculty member that was peer evaluated said peer evaluation, “gets people talking, gets dialog and interaction going, and allows for faculty to see what others are doing. The process is a benefit." Another faculty member mentioned there is "not a lot of talk about teaching - (peer evaluation allows you to) interact with folks with teaching themes."

Individuals that were peer evaluated hope that committee members will look for key concepts such as organization, clear/fair expectations, communication of what is expected, and communication of concepts when evaluating their teaching.

Negative aspects of peer evaluation, according to those that were peer evaluated, include the reluctance to use negative feedback due to promotion, tenure and awards. One individual said, "If (peer evaluation is) used for TIP, it is not a true reflection of teaching." One individual interviewed felt there were no benefits, no changes as a result, and that peer evaluation "confirmed my belief that the system does not work. We are not enforcing the true meaning of what the institution is intended for. We are encouraging mediocrity, and promoting a non-productive system."

Two suggestions for making changes in peer evaluation were made by those who were peer evaluated. The first suggested change was to separate peer evaluation from promotion and tenure. The second suggestion was to use an outside evaluation team, including professional teachers and/or blind reviewers. As one individual stated, "The reviewers themselves are not professional teachers trained in pedagogy." Another teacher said we are basic scientists, with little or no formal training, and many have a lack of respect for this." Still, another person who was peer evaluated felt that, "Changes are needed in assessment and the reporting system, we are receiving college wide evaluation inflation – people are reluctant to provide criticism because of promotion and tenure."

The faculty who were peer evaluated suggested that the long-term impact affecting their respective departments will be that peer evaluation will improve the quality of teaching. Those who were evaluated also felt that teaching is more widely recognized as a valuable effort in the institution. One faculty member stated that, "It (peer evaluation) has created a college-wide awareness that teaching IS important and not just a chore." Other faculty member's comments include, "We are far better off with peer evaluation, for the students, the improvement of teaching " and "Peer evaluation is part of an overall emphasis of improving teaching."

Common themes among department chairs, peer evaluation committee chairs, and peer evaluated faculty in their assessment of the peer evaluation process.

The researchers utilized triangulation to analyze the data. The following common themes were identified among the three groups. The participants believed that the primary purpose of peer evaluation is to provide evidence for promotion, tenure, and teaching awards. The feeling that the peer evaluation process has improved teaching in the college was a major theme in each group. In addition, each group believed that the continued use of peer evaluation in the college would improve teaching. These improvements occur not only in the faculty being evaluated but also in the faculty conducting the evaluation.

All three participant groups stresses two major negative aspects of peer evaluation. First, time was considered to be a major constraint. Although the participants agreed that the peer evaluation process held major benefits, the amount of time required to complete the evaluations is a deterrent. All groups cited the reluctance of committees to use negative feedback because of promotion and tenure, and award implications. The groups felt that this is a major problem and that the peer evaluation results were clouded as a result of this practice.

Discussion

All groups involved with the peer evaluation process agreed that peer evaluation improves the quality of teaching. The use of peer evaluation should be continued and enhanced in UF/IFAS College of Agricultural and Life Sciences. The overriding perception that peer evaluation is used primarily for promotion, tenure, and awards needs to be addressed. Why does this perception exist? What are the perceptions of those outside of the peer evaluation process?

All groups agreed that teaching improved as a result of peer evaluation. They agreed that teaching improved not only for the faculty being evaluated, but also for the faculty serving on the evaluation committee.

The amount of time spent for peer evaluations is a major concern. The most qualified teaching faculty are being taxed by serving on too many peer evaluation committees. Perhaps faculty that are not the best teachers could be utilized on committees where they could work with committee members who are "master teachers." This would serve not only the person being evaluated but also faculty who are a part of the evaluation process. Departmental policies need to be evaluated for efficiency. Faculty and administration need to determine if the benefits outweigh the time costs.

All groups were concerned that the faculty who could benefit most from peer evaluation are not being evaluated. Currently, faculty are evaluated once before being promoted to associate and full professor and if they apply for a faculty teaching award. Given the benefits of peer evaluation cited in this study, perhaps the College of Agricultural and Life Sciences should explore options that would encourage (or even require) all teaching faculty to be peer evaluated.

The reluctance of committees to use negative feedback weakens the peer evaluation process. Non-punitive peer evaluations may be in order. Perhaps other, less invasive tools for improvement of teaching should be used before being peer evaluated.

Discrepancies existed between the department chairs, committee chairs and faculty who were peer evaluated as to the criteria for evaluating teaching. More preparation in pedagogy is needed for peer evaluation committees. Better communication of expectations between the department chairs, committee chairs, and the faculty member being evaluated is needed. Peer evaluation policies need to be examined for clarity and validity.

As a result of this study the researchers recommend that the College of Agricultural and Life Sciences at the University of Florida continues to utilize peer evaluation for the purpose of improving instruction and as a tool for evaluating faculty teaching. Further study is recommended in the area of peer evaluation to determine the impact of peer evaluation on the teaching and learning process.

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A Qualitative Evaluation of Customer Service Provided by an Agricultural Center of Excellence

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Abstract

The purpose of this evaluation was to determine customer satisfaction, effectiveness, and the overall impact of technical assistance provided to industry by the personnel of a state agricultural and food products value-added Center of Excellence. Qualitative methodology was employed to satisfy the objectives of this study. Findings indicate that customers were overwhelmingly satisfied with Center services and their expectations were generally met through interactions with Center personnel. The Center is making an economic impact on the value-added products industry. Recommendations were grounded in customer suggestions and included improving communications with customers, improving the public profile of the Center, targeting new customer groups, and improving communications between the Center and industry. Implications for this study suggest that the dichotomy between service (extension) and research activities has yet to be bridged within the Center of Excellence. As an academic unit housed within a College of Agriculture at a major land grant university, Center faculty have difficulty institutionalizing a culture that is sensitive to industry demands for professional communications, timeliness, efficiency, and providing cutting edge service to customers.

Introduction and Theoretical Framework

A regional agricultural and food products value-added Center of Excellence (hereafter referred to as the Center) was established in 1997 with the mission to generate and disseminate technical and business information to stimulate and support the value-added food and agricultural products and processing sector of the economy for the state. This innovative mix of academia and industry sought to combine university research professors and industry professionals to form a unit whose purpose was to create new value-added food products in order to keep raw commodities in the state and increase economic development. The leaders of the land grant university, including the Dean of the Agricultural College, enthusiastically advocated this project. After much legislative debate in the capital city, funding was granted over several years to build the facilities, which are located just 100 feet from the College of Agriculture.

Research faculty were drawn from the College of Agriculture and assigned split appointments with more than half their time devoted to research activities (70% experiment station/30% extension). They were commissioned to serve value-added customers throughout the state by developing value-added products in conjunction with entrepreneurial customers who would, in turn, patent the products. The Center's mission assumed that knowledge and information created and disseminated by its researchers to the value-added food products industry would lead to an increase in health standards, productivity, and job creation throughout the state. It also assumed that such outcomes would stimulate the regional economy and quality of life for citizens. These assumptions could not be proven without systematic and continuous evaluation of Center activities including faculty relationships with customers; hence, a qualitative evaluation was commissioned to determine customer satisfaction with Center services.

For the purposes of this study, customer satisfaction was defined as the extent to which customers' expectations were met or exceeded by the service received from the Center. If a customer perceived that their expectations were met or exceeded, they were considered a satisfied customer. The primary reason for measuring customer satisfaction was to collect information regarding changes that should be made within the organization concerning service and delivery systems. Data collected on customer satisfaction can also be used to assess how well the Center is currently delivering on its understanding of customer needs. By measuring customer satisfaction, the Center makes certain implied, and perhaps explicit, promises about its interest in and responsiveness to serving its customers (Vavra, 1997).

Deming (1982) advocated a holistic approach to quality management and coined the term "Total Quality Management". Managers must examine the entire organizational system when using the Deming philosophy, including suppliers and customers. As the Center was established as a service organization, the Deming paradigm is an appropriate framework for determining overall effectiveness of the organization. This paradigm was used to frame this study and interpret findings since the major tenet of total quality management focuses upon a positive synergistic relationship between the company and the customer (Walton, 1986). Without customers, the Center would not exist. Therefore, the ability to please customers should be considered a top priority for hiring and training faculty (Deming, 1982).

Purpose and Objectives

The purpose of this study was to begin the process of systematic and continuous evaluation of Center activities including faculty relationships with customers. The specific objectives of the study were to evaluate customer satisfaction, effectiveness, and overall impacts of the services delivered through the Center.

Methods

The objectives of the study were accomplished by evaluating various aspects of the customer-faculty relationship from customer entry through completion of the project. Research methodology and instrumentation were developed in conjunction with the information needs of the client. The researchers attempted to understand whether or not customers were satisfied with Center services and what factors contributed to or detracted from their satisfaction. Customers were also queried regarding their progress toward attaining their business goals as a result of Center assistance and changes in the their business practices as a result of intervention from the Center.

The population for the study consisted of companies that had solicited services from the Center from 1997 to 1999. Of the 180 companies that had contacted the Center, 45 were randomly selected to participate in the study. As not all of the companies listed in the customer database had significant interactions with Center faculty, a Center staff member screened out those customers who had only requested information from the Center and had minimal contact with Center faculty. After the initial screening and solicitation for cooperation, 21 customers[1] participated in the study by consenting to a one-hour face-to-face interview. Customer profiles ranged from small family-owned businesses that were just entering the value-added food products market to large corporations employing hundreds of personnel. Due to our confidentiality agreement, no further descriptors of customers will be provided. The nature of each project was so unique that any further demographic data would indicate who participated in the study.

Qualitative data were collected and analyzed based on participant observations of Center activities and in-depth semi-structured interviews with customers (N=21). A structured list of interview questions was developed as a result of an extensive review of the literature surrounding customer satisfaction and in conjunction with Center personnel information needs (see Appendix A for a copy of the interview schedule). The interview schedule was adhered to for all interviews as well as for engaging participants in probing questions that evolved during the interview process (Merriam, 1998). Interviews lasted no longer than one hour each and were audio taped and transcribed for verbatim accuracy. A copy of the printed transcript was sent back to participants for verification of accuracy. One transcript was returned for grammatical corrections.

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[1] The study was approved by the Oklahoma State University Institutional Review Board on November 1, 1999 for one year and was assigned IRB # AG-00-046. Human subjects were involved in the study from December 1999 to July 2000.

Data analysis consisted of loading the interview text into a data analysis software program called ATLIS.ti (available at www.atlasti.de) where the interviews were coded for themes and patterns. The coding process consisted of highlighting a passage of the text and electronically tagging it to a predetermined code. Eighty-one codes (units of meaning) were developed from the interview text and were isolated and interpreted using the Deming framework. Memoing (writing notes about each code) and matrix methods (cross checking codes for relationships and interactions among themes) allowed the researchers to make claims that were rooted in the data (Miles & Huberman, 1994). To increase overall trustworthiness of the conclusions drawn, findings were presented to the client for confirmation and validation of interpretations (Merriam, 1998). Because the 21 customers were randomly selected from the population, it is appropriate to generalize the results of this study back to the population of Center customers; however, due to their focus on a particular situation, evaluation studies are limited in their ability to generalize beyond this case.

Findings

The findings are reported in conjunction with the research questions that guided this study and are grouped accordingly. All data reported are based on the interviews collected from December 1999 to June 2000. This section will report interpretations made by the researchers from customer statements (claims are in *italics*). In order to protect participant confidentiality pseudonyms have replaced the actual names and the pronoun "he" is used to reflect gender in all responses even though several women were interviewed for this study.

Customer Satisfaction with Center Services

The majority of customers interviewed were overwhelmingly satisfied with Center services. Seventeen out of 21 customers indicated that they were satisfied while four replied that they were not satisfied with Center services. Reasons for satisfaction ranged from customers having a positive relationship with Center faculty to the faculty showing a high level of commitment to their projects. There were also a variety of reasons for customer dissatisfaction, which ranged from receiving inaccurate information to failure to complete the project as promised. The following themes surrounding satisfaction and dissatisfaction emerged during the customer interviews.

Customers experienced positive relationships with Center faculty. Twenty interviewees explained that they had a very positive professional relationship with Center faculty and described faculty as helpful, professional, friendly, personable, and considerate. However, one customer indicated that he would not recommend Center faculty as being professional due to the way his project was managed. This customer was told through a phone conversation that the Center would no longer continue with his project, leaving the customer with no alternatives for assistance.

Center faculty recommended alternative processes for customers. Twelve customers responded that their project coordinator gave them more than one means by which to solve their project problems. They indicated that this was important as it saved the customer money. Two customers said that they were not given alternatives because they were not appropriate in their particular situation. Regrettably, three customers indicated they were not given alternative solutions to their problems and voiced concern that Center faculty did not have ample knowledge and expertise to facilitate their projects. These customers were displeased with the services they received and indicated that they would not seek further assistance from the Center. They stated that if they could not receive adequate assistance on their initial projects, then how could the Center provide the information on additional projects in similar areas? One customer reported that he was provided inaccurate information pertaining to his project.

Center faculty gave customers alternative sources of information to help solve their problems. Eight of the 21 customers interviewed stated that they were given additional references to contact if further assistance was needed and the Center was not able to provide further advise. Not having to seek out this information on their own was helpful to customers and facilitated a growing network among value-added producers. In contrast to the excellent service given most customers, one customer indicated that the information he was given was more than thirty years old. This person believed that the Center should be able to supply more recent information on the topic. In spite of this faux pas, he did indicate that he was generally satisfied with the Center's services and would return to complete his project, although he hoped to receive more current research findings in the future.

Customers found that the Center director was approachable. Eight customers mentioned contacts with the Center director throughout their projects. In general, they reported that it was very important to be able to have positive contacts and interactions with the Center director, who was described as very approachable. These customers were very satisfied with Center services and attributed contacts with the director as a factor to the success of their projects.

Center faculty showed a high level of commitment to customers' projects and were available to answer customers' questions. Fifteen satisfied customers reported that the Center showed a significant commitment to their projects. Commitment to the project was not directly asked during every interview; however, it emerged 15 times, indicating its importance to customer satisfaction. In contrast, two customers believed that Center faculty viewed their project as unimportant because they were not large corporations or did not have an extensive project for which the Center could get a significant amount of publicity. The Center faculty neglected to return customers' phone calls as well. Two customers indicated that they tried to contact Center faculty regarding their projects and did not receive a proper return contact. These customers were very dissatisfied with the services they had received. Both indicated that they would not return to the Center for additional services partially because of the failure to follow through with communications. Another customer indicated that this type of incident was not typical of the particular faculty member that he dealt with. However, he did express that the lack of contact caused him anxiety regarding the progress of his project.

Customers were able to successfully start a business. Several customers indicated that a major factor in their satisfaction was being able to successfully get their businesses started because of the assistance provided by the Center.

Customer was falsely led to believe that the Center would assist him in developing a value-added product. One customer indicated that a Center representative misled him. He was told that the Center would assist him in developing a new product and was initially given directions from the Center on the procedures to initiate the project. After investing time and money into the project he was told that the project would not be continued. This particular customer was extremely dissatisfied with the Center's services, but was able to successfully complete his project with the assistance from another university. He stated that he would not return for additional assistance.

The Center failed to complete customer's project. Three customers were dissatisfied with the Center's services because the Center failed to provide the information and assistance required to complete their projects.

Effectiveness of Services

This study identified several characteristics of the effectiveness construct. The most important attribute was whether or not the customers' questions were answered and/or their projects were completed. Other attributes included whether or not the customers' expectations were met, if they would return for additional services, effectiveness of communication, timeliness of services, and what the customer perceived as the most helpful aspect of their services.

The Center was effective in answering customers' questions and completing projects. Twelve customers stated that the Center was effective in answering their questions and/or completing their projects. Two customers explained that they are still in the middle of their projects but indicated that the Center had been effective in meeting goals up to the time they were interviewed. Four customers stated that the Center was not effective in completing their projects. The principal reason stated for the Center's lack of effectiveness was that the customers did not receive the necessary information and assistance required to complete their projects. It was stated on more than one occasion that time delays had a role in the project not being completed.

Customers' expectations were met by the Center. Customer expectations were broadly defined, as what the customer perceived would be the result of an interaction. Customers indicated that a direct link existed between satisfaction and expectations being met. Of the 21 interviewees, 16 responded regarding expectations of the Center. The reason for the lack of response from the remaining interviewees was due to the context of the respondent's project or relationship with the Center. Fourteen respondents indicated that the Center had met or exceeded their expectations. Accordingly, seventeen customers interviewed for this study were satisfied with the Center's services.

Most customers would consider returning for additional services from the Center. When customers indicated that they would return to the Center for additional services it is implied that they were satisfied with their overall experience; thus, indicating that the Center was effective in successfully giving customers what they expected. Fifteen of the 21 customers interviewed specified they would eagerly return to the Center again if they needed additional assistance. However, two customers indicated that they would not return, and one said that he would only return reluctantly. The main reason for dissatisfaction in these specific instances was not receiving requested information.

The Center was effective in communicating with customers. Interviewees indicated that communications between the customer and the Center were effective and added to the positive impression of Center services. Eighteen customers felt that the Center was extremely effective in communication. One indicated that he felt communication was only satisfactory, while the other two did not respond to the question.

Center services were presented in a timely manner. Thirteen customers felt that the Center dealt with projects in a very timely manner. A specific customer stated that time delays caused a hardship for his business. Four customers indicated that the Center did not meet deadlines and failed to complete the customer's project in a reasonable amount of time. Three customers did not respond to the question due to of the length of time between their projects and the interview.

The Center was most helpful in delivering services in 10 categories. Customers cited that the variety of assistance provided by the Center was helpful in making their project a success. Helpful aspects of assistance that were mentioned were 1) constant education, 2) product evaluation, 3) a particular faculty member, 4) facility use for training, 5) guidance through the entire process, 6) information regarding the legalities of marketing a product, 7) the complete process, 8) communication, 9) positive information regarding the Health Department, and 10) linking the project to other aspects of the industry.

Overall Impact of Services

The Center has made an impact on the community. The actual outcome of each project is difficult to measure quantitatively; however, this study sought to understand from the customer's perspective what outcomes resulted from receiving assistance from the Center. Table 1 details actual impacts as a result of the customer's interactions with the Center. Not all customers responded to this question as some projects were still in progress with the Center and some were not directed at the same types of outcomes.

Table 1: *Impact of Center Services on Customer's Business*

Customer	***Impact of Service***
Sam	Four new value-added products were developed.
Ed	Products are now sold in 23 states and distributed in England.
Wade	Increase in business sales due to Center sending him new customers.
Doug	Consumer awareness of Oklahoma products has increased sales.
Kyle	Able to market products throughout many different states. Two new value-added products were developed.
Todd	Gained knowledge of how to evaluate a process within his industry.
Dick	Gained the ability to package, process, and successfully market products worldwide. Employs four people full-time and will ultimately employ a total of 15 people. A new business was successfully started. Nine new value-added products were developed.
Jim	Developed a fresher, more desirable product.
Tim	Has generated approximately one million dollars of business as a result of input from the Center.
Bob	A new business was successfully started and 130 new jobs were created within a three-year projected timeline.

The Center has contributed to professional networks for its customers. Several customers indicated that Center faculty provided them with professional networks that were very important to their company's success and contributed to an increased sphere of resource acquisition and connections within the value-added industry. One customer indicated that as a result of the contacts provided by the Center he was able to decrease his input costs.

The Center has successfully bridged the gap between academia and industry. Customers reported that Center faculty explained methods and materials in terminology that was appropriate and easily understood by the customer. They indicated that appropriate communication was a very important factor in determining the effectiveness of the Center. However, a few customers pointed out that they had some difficulty with receiving information that went beyond their comprehension and suggested that academia (the Center) had difficulty in recognizing timelines, understanding that the most important end product in industry is generating a profit, and that Center faculty lacked an overall understanding of commercial ventures.

Public Awareness of the Center

An important theme that emerged spontaneously during the interviews was the lack of public knowledge of the services provided by the Center. This broad topic has been broken down into subcategories in order to better examine this uncertainty. The following subcategories are marketing of the Center, general knowledge of the Center and its services, and utilization of the Center.

The Center had not marketed its services effectively to the general public. The majority of customers that responded to this topic stated that the Center did not advertise its services well to the general public. Many indicated that enhanced promotion would help to increase public awareness of the facility and the services offered.

The majority of people within the state did not know about the Center or the services offered. Awareness of the Center in general along with knowledge of the services provided was minimal. The majority of responding customers indicated that the average person did not know about the Center. Of the fifteen interviewees that commented on this issue, thirteen indicated that they did not know that the Center existed before having a project there. Many also indicated that they were not clear about the different services that the Center offers. Interviewees cited a lack of visible promotion activities as the reason for not knowing about the Center or the services that it offers. Customers also suggested that the relative newness of the Center was a limiting factor in public awareness. Customers reported that the following sectors of the economy were knowledgeable of the Center and its services: the grocery community, the food science community, participants involved in research and development in the food-processing domain, and Agriculture alumni of the University.

The Center was not fully utilized by potential customers. Customers stated that they thought the main reason people didn't use the Center was because they are simply unaware of it.

Recommendations

Based on the findings from this evaluation, it is recommended that the Center continue the following practices, which will contribute to and foster excellent customer satisfaction:

1. Develop positive interpersonal relationships with customers.
2. Provide customers with a variety of means to solve their project problems that incorporate both high and low cost alternatives.
3. Provide customers with alternative information sources for answering questions when the Center is unable to satisfy customer requests.
4. Form positive, helpful relationships between the customer and the Center director.
5. Maintain high levels of commitment to customer projects.
6. Meet and exceed customers' expectations.
7. Provide satisfying services so customers will return for additional services.
8. Effectively communicate with customers orally and in writing.
9. Aid customers in the development of new businesses and products to improve the state's economy.
10. Provide customers with access to professional networks to ameliorate their businesses practices.

11. Bridge the gap between academia and business as indicated as a part of the Center's purpose statement.

Categories for improvement fall under marketing its services, professional communication, and quality of assistance provided. Based on the findings of this study it is recommended that the Center adopt the following practices in order to better serve customers:

1. The Center should focus on appropriate and professional communications to avoid misunderstandings with customers.
2. The Center should strive to provide customers with the highest quality and most recent information and technology available to complete their projects.
3. The Center should treat all customers equally regardless of size or scope of the project.
4. The Center should seek out knowledge and expertise to assist customers with requested service.
5. The Center should strengthen its public relations profile to enhance its ability to serve new customers, especially those facets of the value-added products industry that are currently underserved.
6. A systematic flow of information should be developed between academia and industry to increase opportunities for communication.

Conclusions

Customer satisfaction occurs when the outcome of a service delivery meets or exceeds customer expectations (Brown & Swartz, 1989). Clearly, the Center has successfully satisfied the majority of its customers by meeting their expectations for service. The Center has also effectively delivered its services to customers as the majority of customers noted that their projects were successfully completed. Other important factors that contributed to the Center's effectiveness were timeliness and communication skills, along with the variety of specific services that were offered to customers.

The Center has made an important impact on the value-added products industry in this state. One of the explicit goals of the Center was to help develop successful value-added enterprises that would retain raw commodities and jobs within the state. Through the findings of this evaluation, it is evident that the Center has successfully accomplished its mission in that new businesses have been generated and jobs have been created. However, quantitatively determining the impact of the Center was beyond the scope of this study and should be determined by further cost-benefit analysis studies.

Discussion and Implications

The Center represents an innovative mix of academic and industry cultures, which holds special challenges when serving nonacademic customers. The Center is a publicly funded institution that is operated by research professors. Its mission is to serve the value-added food and agricultural products industry within the state. Given this dichotomous role, the Center is doing surprisingly well in accomplishing its customer-driven mission.

However, there is much room for improvement. One area for consideration is the current reward structure for Center faculty. Research professors are expected to garner one to three refereed publications per year in order to retain their status as researchers (Kelsey, Maringer, & Pense, 2001). This creates an environment with extreme pressure to seek opportunities that will lead to publication, which in turn undermines service activities that result in few tangible (and tenure-related) products. With these pressures in mind, faculty are more likely to focus on projects that have a greater potential for resulting in prospects for publication. It should be noted that many of the customers who were overwhelmingly satisfied with Center services had high profile projects that resulted in large impacts and subsequent publishing opportunities for the research professors connected to the project. Some customers who were dissatisfied had projects that were commonplace or small in scope. These customers reported that they felt discounted by Center faculty because their projects were not sensational.

The current publish or perish paradigm that exists in research universities today is an inappropriate fit with the Center's mission. The highest levels of customer satisfaction are unachievable under conditions that encourage and reward research over service. We know that all of the Center's customers are not being treated equally. What we do not know is the exact cause of this disparity. Is it due to the perceived desirability of customer projects to the research professor based on the current reward structure? If so, can the Center accomplish its mission given its ties to academia?

In the final analysis, the customer must come first in any service-oriented business, and by commissioning this evaluation, the Center has demonstrated a sincere commitment to customer satisfaction, a necessary first step to institutional reflection. However, in order for the Center to become completely customer driven, radical change must occur within the institutional structure and culture. As evaluators, we leave this task to the decision makers, who will ultimately be held accountable to the citizens of this state for the outcomes of the Center.

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Appendix A

Interview Schedule

Customer Satisfaction

- How would you define customer satisfaction?
- Were you satisfied with the services provided by the Center? Why or why not?
- What were some of the positive incidents?
- What happened that you didn't like?
- What were your expectations of the Center's services?
- Were these expectations met?
- Would you consider returning to the Center for additional services? If so, what types of services would you request?
- What are other possible resources you could use in place of the services provided to you by the Center?
- If you were not satisfied with the services that you received would you state your complaints to faculty members? Would you feel restrained in stating these complaints?
- Are there any possible situations that would increase your satisfaction with the Center?
- Was cost a factor in choosing to use the Center's services or not?
- Do you feel that your interactions with the Center have caused you to become more customer focused in your own business interactions? Why or why not?

Effectiveness

- Was the advice given by the Center effective in solving your problems or completing your project? If so, could this be equated to a specific result or improvement in your business?
- What was the most helpful aspect of services you received from the Center?
- Did you receive information that was not helpful?
- How can/did the Center assist you in regard to new product development?

Project management

- Do you feel that your project was managed effectively in terms of timeliness, professionalism, and organization?
- Do you feel that the Center saw your project/problem as significant?
- Did the Center give you alternative ways to solve your problem if the cost of the first recommendation was too expensive?

Communication Skills

- Do you feel that the Center was effective in communicating with you in terms of written reports, telephone calls, letters and any other possible means of interaction?
- What type of relationship do you feel that you have/had with the Center's faculty?
- Were lines of communication left open for any questions that may come about in the future?
- Has there been any follow up? At what intervals? With any regularity?

Responsiveness to Changing Needs

- How did the Center react to changes in your project?
- Were they quick to respond to these changing needs?
- How do you feel that they handled these problems?
- Do you have any other suggestions for the Center to help them improve customer satisfaction, effectiveness, communication, responsiveness, and quality?

Gathering Stakeholder Input for Setting Research Priorities at the Land Grand University: A Pilot Study

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Abstract

The American public is demanding higher accountability from land grant universities as evidenced by declining financial support for higher education where the majority of agricultural research is conducted. Reasons for declining financial support may be a perception of disenfranchisement and concern by stakeholders that public dollars spent on research only benefits a narrow segment of the economy.

In light of declining public support for publicly funded research, the 1998 Farm Bill (Public Law 105-185) stated that stakeholder input must be collected when setting research priorities. This paper advances a model for collecting and implementing stakeholder input into setting research priorities at land grant universities that is grounded in Guba and Lincoln's Fourth Generation Evaluation theoretical model (1989).

The proposed model describes a process that will streamline and facilitate gathering stakeholder input in a direct and user-friendly manner. This model should be tested and further refined at other land grant institutions to meet the current and pressing need for greater public accountability. Implications of this study include a discussion of the importance of collecting stakeholder input and consequences of operating without community participation.

Introduction

Stakeholders of the land grant university system have benefited greatly in the past century as evidenced by the green revolution. Just two farmers can produce enough food and fiber for 100 urban and suburban dwellers, freeing them to pursue other vocations. Although agricultural research and development activities are not eminent to most stakeholders, the agricultural industry accounts for nearly 13.5% of the gross domestic product and employs 18% of all U.S. workers (Lechtenbert, 1998). In spite of the agricultural advancements made over the past century, urbanization and technology have continued to distance Americans from their agricultural heritage. It is not surprising that the public demands increased accountability from publicly funded research institutions evidenced by declining financial support for higher education where the majority of agricultural research is conducted (Altschuld & Zheng, 1995).

In this vein, the 1998 Farm Bill (Public Law 105-185) required that stakeholder input be collected when setting research priorities. Section 102c, Priority Setting Process, specifically stated (italics added):

> Effective October 1, 1999, to obtain agricultural research, extension, or education formula funds from the Secretary, each 1862 Institution, 1890 Institution, and 1994 Institution shall *establish and implement a process for obtaining input from persons who conduct or use agricultural research, extension, or education concerning the use of the funds.*

This legislative mandate focused on two important criteria required for land grant institutions to obtain research funding from the USDA: (1) setting priorities for agricultural research, extension, or education (accomplished through the Plan of Work established by the Government Performance and Results Act); and (2) obtaining stakeholder input when setting priorities for research, extension, or education. Operating without stakeholder input poses a serious threat to continued public funding for agricultural colleges.

With the U.S. Congress requiring stakeholder input at the national level (PL 105-185), a paradigm shift must occur from traditionally top-down priority setting by college deans and advisory groups to a more inclusive and democratic action research methodology for determining the direction of publicly funded research. Typical Plan of Work strategies have included both internal and external methods for assessing stakeholder input. Communication has been filtered from department heads to the dean's office for consideration when setting research priorities. Externally the deans' advisory councils, often representing major state commodity groups, have provided input on key planning issues.

These strategies are important for collecting stakeholder input, but they represent those stakeholders who are already committed and highly vested in the process. An expanded methodology was needed that would not only include agents and beneficiaries of university programming, but also engage underrepresented citizens who have lost opportunities as a result of university programming (Guba & Lincoln, 1989).

An enhanced and stable model for obtaining stakeholder input should be developed; one that could be implemented, replicated, and refined at every land grant institution that receives public funding. Developing a model for gathering stakeholder input should be comprehensive and address all agricultural commodities for each state. The Oklahoma State University Forestry Department was chosen as a case study to develop a pilot model for gathering and implementing stakeholder input into research priority setting using Guba and Lincoln's (1989) *Fourth Generation Evaluation* theoretical framework.

Purpose and Objectives

The purpose of the study was to introduce a pilot model for collecting and implementing stakeholder input into setting research priorities at all land grant institutions in an effort to meet the mandate of the 1998 Farm Bill (Public Law 105-185). The specific objectives were to:

1. Establish a need for the model and demonstrate application of theoretical principles for collecting stakeholder input.

2. Develop a streamlined pilot model for collecting stakeholder input in research priority setting.

3. Outline the pilot efforts that have been completed at Oklahoma State University regarding collecting stakeholder input for setting research priorities as a case study.

Guba and Lincoln's Model for Collecting Stakeholder Input

To collect stakeholder input for research priority setting, this study used a modified fourth generation evaluation model outlined by Guba and Lincoln (1989). The pilot model includes adjustments to Guba & Lincoln's processes and roles of participants. The purpose of making the adjustments was to increase stakeholder representation and to increase implementation of the model.

Guba and Lincoln's (1989) model provided both the needed historical context and a detailed methodology described in *Fourth Generation Evaluation*. As implied by the name of their model, Guba and Lincoln outline three forerunner generations of evaluation. The first generation was termed "measurement" and involved the use of IQ tests, examinations, and other forms of educational measurement techniques. The evaluator assumed the role of an unbiased technical expert who administered, scored, and reported test results. The second generation was descriptive in nature and cast the evaluator in the role of observer/describer of programs and individuals in relation to definable objectives. The third evolving generation of evaluation was "judgment", which cast the evaluator in the role of expert. As expert, the evaluator made judgments on the merit and worth of the program in light of its described strengths and weaknesses relative to the objectives or outcomes expected of the program.

These three generations included boundaries and parameters for evaluation that were established *a priori*, or through deductive reasoning, where boundaries were established through negotiations between the client and the evaluator. Fourth generation evaluation was termed "responsive constructivist" as it exemplified a responsive approach by negotiating parameters and boundaries of the study through an interactive process involving all stakeholders. This emerging generation of evaluation is constructivist in that the methodology employed has its roots in inductive analysis. It has also been termed "interpretive" and "hermeneutic" as well.

Fourth generation evaluation is a four-phase iterative process with a variety of steps in each phase. The first phase involved identifying stakeholders and eliciting their claims, concerns, and issues (CCI). A claim is an assertion made by the stakeholder that is favorable to the program; a concern is an assertion made by the stakeholder that is unfavorable to the program; and an issue is any state of affairs about which reasonable people may disagree. Guba and Lincoln (1989) described stakeholders as falling into three broad categories: agents are those persons involved in producing, using, and implementing the program; beneficiaries are those persons who profit in some way from the use of the program; and victims (hereafter referred to as underrepresented) are those persons who are negatively affected by the program.

The second phase of fourth generation evaluation involved opening circles of stakeholders to other groups of stakeholders and new information. It is thought that by exposing stakeholders to new information resolution and consensus will occur. In the third phase the evaluator engages in information-gathering, with the expectation that further dialog will occur between the different stakeholder groups to address the unresolved CCI's. The fourth phase involves debate between stakeholders led by the evaluator using information gathered from the third phase in an effort to reach consensus on each disputed item.

From the negotiation process in the final phase of the evaluation, three possible outcomes may result: (1) full resolution and consensus on claims, concerns and issues, which leads to action; (2) incomplete resolution where action is delayed until further information is obtained; and (3) no consensus is reached and no action is possible. An important aspect of fourth generation evaluation is that evaluations will "never stop, they merely pause" (Guba & Lincoln, 1989, p. 226).

Modified Model for Collecting Stakeholder Input

Several procedural modifications to Guba and Lincoln's four-phase model were made for the explicit purpose of streamlining the process (Table 1). We eliminated the hermeneutic circles (discussion groups) in phases one and two. As social science researchers, we chose to collect the CCI from stakeholders directly through interviews and presented the data to the department faculty. This change addressed the issue of obtaining stakeholder commitment for participation and reduced participant attrition (Greene, 2000). The affect of eliminating the hermeneutic circles served to reduce participant burnout and to economize the data collection and analysis process.

Privileging the evaluators to make judgments regarding the legitimacy and inclusion of stakeholders reverts the process back to third generation evaluation and is clearly problematic. It denies stakeholders the opportunity to self-identify and engage in the democratic process (Laughlin & Broadbent, 1996). While we sought to address this concern by deprivileging the client (Forestry Department faculty) and evaluators in phases II and IV, we do call for interpretive filtering of the data (synthesizing data collected) in phase III of our model to expedite the process of implementing stakeholder input into priority setting. This modification is also consistent with eliminating the hermeneutic circles in the modified model.

In phase IV of the modified model, democratic conversations among stakeholders at all levels of the process were encouraged through negotiation sessions. We also added the element of debate to help facilitate action alternatives regarding change to research priorities to phase IV through small group interactions. This modification was in contrast to Guba and Lincoln's belief that action alternatives will naturally result from the consensus obtained through a hermeneutic dialectic process.

Instead of recycling the entire process within hermeneutic circles, which is resource and time intensive, we proposed to establish an on-going communication network to facilitate future priority setting. This network may take any number of forms such as an Internet chat room, online conferences, workshops, newsletters, and email exchanges among stakeholder groups.

The point being that gathering stakeholders synchronously is expensive and time consuming for all parties involved. Allowing stakeholders to contribute to the ongoing dialog asynchronously serves to facilitate a democratic process, while freeing participants to enter and exit the activity at their convenience.

To further streamline the model, Laughlin and Broadbent (1996) suggested that the views of professional experts be privileged in contrast to Guba and Lincoln's model. This change was made with several conditions attached: (1) that the expert does not abuse the privilege; (2) that prior discourse and agreement among all stakeholders be obtained; and (3) that an understanding of fairness issues are clearly understood. Privileging experts served to facilitate the process in that not all elements of research priority setting need to be democratically resolved. For example, the department chair could take stakeholder input and work with faculty to establish a research agenda that is sensitive to stakeholders' needs while working within the confines of the university system.

This project adopted Babiuch and Farhar's (1994) proactive position for collecting and analyzing stakeholder priorities for university research with the explicit purpose of setting future-oriented strategic goals for research expenditures. Guba & Lincoln (1989) provided categories of stakeholders to be included in the study (agent, beneficiary, and underrepresented), and provided components from their twelve-step evaluation model for inclusion in this study's four phases. While the modified model sacrificed a measure of democracy by eliminating the hermeneutic circles, it has resulted in a more direct and linear approach for collecting stakeholder input for research priority setting. The proposed model represents a simpler process that should benefit land grant institutions seeking to include stakeholders when setting research priorities (Table 1).

Table 1. *Comparison of Theoretical Model with the Modified Model for Collecting Stakeholder Input*

Guba & Lincoln's Theoretical Model	**Modified Model**
Pre-evaluation work:	Pre-evaluation work:
a. Initiate contact with client	a. Initiate contact with client
b. Select and train team of evaluators	b. Select and train team of evaluators
c. Make entry and logistical arrangements	c. Make entry and logistical arrangements
d. Assess local political factors	d. Assess local political factors
I. Identify stakeholders and elicit their claims, concerns and issues (CCI)	I. Identify stakeholders
a. Mount continuing search strategies	a. Mount continuing search strategies
b. Establish hermeneutic circles	b. Identify potential stakeholders through staff and self identification
c. Shape the emerging joint	

construction
d. Assess trade-offs and sanctions
e. Formalize "conditions" agreement

II. Stakeholder groups engage in dialog about CCI in order to arrive at consensus
a. Make the circles again
b. Interplay of interview and observation
c. Literature analects
d. Evaluator's etiological construction
e. Sort out resolved CCI

III. Evaluator collects information about unresolved CCI
a. Prioritize unresolved items
b. Collect information
c. Utilize further hermeneutic circles
d. Gather existing information
e. Perform special studies

IV. Negotiation among stakeholder groups to reach consensus about disputed CCI

a. Define unresolved items
b. Illuminate, support, refute items
c. Provide sophistication training
d. Test agenda
e. Carry out negotiation

Post evaluation work:
a. Report findings
b. Recycle the entire process setting

procedures
c. Arrange interview appointments with agents, beneficiaries, and underrepresented stakeholders

II. Information gathering & analysis by evaluation team
a. Interview stakeholders and elicit CCI
1. Forestry Dept. faculty
2. Private land owners (NIPF)
3. Industry representatives
4. Government forestry agents
5. Associations serving forestry
b. Document analysis for CCI
1. Newsletters
2. Brochures
3. Fact sheets
4. Professional journals
5. Departmental records
c. Recording of observations
1. Interviews
2. Conference proceedings
3. On-site (businesses, plants, farms, forests, offices, and labs)

III. Data analysis – Interpretive filtering
a. Analyze interviews for emerging CCI
b. Confirm hypothesis about CCI with stakeholders (two-way negotiation process between stakeholders and evaluators)

IV. Negotiation between beneficiaries and underrepresented stakeholders and agents to reach a consensus about setting research priorities
a. Disseminate negotiation agenda
b. Test agenda
c. Debate within and among groups
d. Implement research priorities

Post evaluation work:
a. Report findings to all stakeholders
b. Establish on-going communication networks to facilitate future priority

Research Design

We employed a qualitative case study approach to gain an in-depth understanding of the situation, values, and opinions of stakeholders within a bounded timeframe (Stake, 1995). Case studies are particularly suited to situations in which it is impossible to separate the phenomenon's variables from their context (Yin, 1994). Qualitative case studies can further be described as particularistic, descriptive, and heuristic: *particularistic* referring to a focus on a particular situation, event, program, or phenomenon; *descriptive* meaning that the end product of a case study is a rich, thick description of the phenomenon under study; and *heuristic* indicating that case studies illuminate the reader's understanding of the phenomenon (Merriam, 1998).

Qualitative data collection is about "asking, watching, and reviewing" (Wolcott, 1992, p. 19); therefore, data were collected through interviews with faculty members and stakeholders, observations, and analysis of existing documents (public records, personal documents, physical materials within the study setting, and researcher-generated documents). Non-structured interviews rooted in the constructivist paradigm were used to obtain data from faculty and stakeholders (Guba & Lincoln, 1989). Interview questions were initially developed from the research questions and were refined throughout the interview process.

The case study was conceptualized as a four-phase iterative process (Table 2). The four phases were designed to provide other researchers with a framework for collecting stakeholder input that would encourage democratic conversation among diverse stakeholder groups at all levels of the process.

Table 2. *Four Phases for Collecting Stakeholder Input*

Phase	Objective of Each Phase
I	Identify and select stakeholders who fall into agent, beneficiary, and underrepresented categories. Collect stakeholder input. Early stakeholder involvement establishes legitimacy and reinforces the perception that dialogue is critical for success.
II	Assimilate and implement stakeholder input into university research priority setting activities.
V	Continue ongoing communications with stakeholders. Dialogue among stakeholders will be continued through networks affording multiple opportunities for stakeholder engagement.

The Case: Population, Sampling, Data Collection, and Analyses

We began the project by obtaining political and financial support from the Agricultural Experiment Station director and the Forestry Department head. We chose the Forestry Department at Oklahoma State University for three reasons. First, the department has 12 faculty members currently conducting basic and applied forestry related research, providing a manageable number for qualitative data collection. Second, most of the forest industry exists in the southeast region of the state, further lending this case to a contained and manageable population. Third, most of the Forestry Department's research funding was provided by the USDA through McIntire-Stennis funding, holding the department accountable to the 1998 Farm Bill mandating the collection of stakeholder input for setting research priorities. The pilot study would not only help the Forestry Department meet the legal requirement of PL 105-185, but also would provide improved communication and public relations with departmental constituents. As a result, faculty members of the Forestry Department were willing to participate in the study. We were granted time on the Forestry Department faculty meeting agenda in early spring 2000 to present our research agenda and, at that time, were given access to the research site.

Identification of stakeholders has been problematic in past participatory evaluation studies (Greene, 1988). Therefore, the first step in this study was to identify and select stakeholders based on theoretical definitions of stakeholders. Guba and Lincoln (1989) place stakeholders into the three categories of agent, beneficiary, and underrepresented. A*gents* are those persons involved in producing, using, and implementing the program; *beneficiaries* are those persons who profit in some way from the use of the program; and *underrepresented* are those persons who are negatively affected by the program. In addition, Greene (1988) defined appropriate stakeholders for participation in priority setting as those who (a) have legitimate stake in the outcome, (b) have sufficient program knowledge to contribute to the process in meaningful ways, and (c) have a high self-defined stake in university research. Ideally, stakeholder representation in a participatory model should be based on relative stake in the outcome and a commitment to the process, rather than on superficial diversity criteria; embracing core values of equity, parity, and justice (Greene, 1988).

The initial population of bona fide stakeholders was the faculty members actively engaged in research, who were categorized as agents. After the introductory faculty meeting, we made appointments with each of the 12 faculty members and conducted one-hour face-to-face interviews. Interviews were designed to familiarize participants with the priority setting process, to elicit their concerns about the process, and to stimulate thinking about the issues (Guba & Lincoln, 1989). We also asked the faculty members to identify potential stakeholders that would be categorized as other agents, beneficiaries, and underrepresented (staff identification of stakeholders). The faculty provided us with mailing lists and directories and they identified nine categories of individuals or organizations that held a legitimate stake in their research. They included (1) nonindustrial private forest landowners (NIPF); (2) government organizations such as the state and federal forest service; (3) private organizations that serve the forest industry; (4) tree farmers; (5) forest managers; (6) other academics and scientists; (7) those involved in urban forestry; (8) wildlife conservationists; and (9) students. Native American tribal members and NIPF's were categorized as underrepresented stakeholders. Thank you notes and a copy of the transcripts were sent to the faculty interviewees for verification of accuracy. Two transcripts were returned for grammatical corrections.

From faculty identification, including the Experiment Station Superintendent who was located in the Oklahoma forest region, 63 purposively selected individuals who had a legitimate stake in forestry research were interviewed. Purposive sampling was used because it was more important to have a range and salience of perceptions than to have quantifiable measures of the distribution of stakeholder input (Babiuch & Farhar, 1994; Greene, 1988).

The 75 audiotaped interviews and field notes were transcribed verbatim, cleaned, and loaded into a qualitative data analysis software program called ATLIS.ti (available at www.atlisti.de). The data were analyzed following Miles and Huberman's (1994) memoing and matrix techniques. Codes (units of meaning) were developed using the broad research purpose as a guide for identifying themes within the data set. Themes centered on stakeholder problems and information needs surrounding forestry issues. The coded data were then isolated, reviewed, and interpreted by the researchers, who met regularly to discuss and negotiate findings and conclusions. To increase overall trustworthiness of the conclusions, preliminary findings were presented to the Forestry Department faculty during a faculty meeting on October 6, 2000 for confirmation and validation. The process of member checking resulted in several changes in the manuscript to accurately reflect participant's responses.

Findings from the 63 stakeholder interviews were synthesized into a final report that was distributed to the Forestry Department faculty members December 2000 (Kelsey, Pense, & Maringer, 2000). The report included the following topics: population and stakeholder connection to the forest industry; stakeholder information needs; stakeholder perceived problems; stakeholder information needs; sources of information used by stakeholders; stakeholder use of OSU cooperative extension services; stakeholder based recommendations for the OSU Forestry Department; information needed by stakeholders; ways to package and promote information; and changes in practice. After the data set was presented, a formal letter was sent to the department head by the evaluation team requesting that a smaller working group be established to continue the iterative, dialogic process of implementing stakeholder input into research priority setting.

Plans for reengagement are in place for early spring 2001 and include forming a working group to assimilate the findings and establishing ongoing communication channels with stakeholders. At this writing, the Forestry Department head has identified four faculty members who are interested in participating in the working group. The evaluation team plans to serve in a facilitator role throughout the process, aiding and serving but not involved in decision-making (deprivileging the evaluators). The hoped for outcomes of this work are that the faculty will proceed with their daily business in a more enlightened fashion with the needs of stakeholders firmly in mind, sensitive to serving those who provide the financial support for their positions at the university.

Validity and Reliability

The study's strategy for enhancing validity included four methods endorsed by Merriam (1998). *Triangulation* strengthened the overall validity by obtaining data from multiple sources. In this case, 75 interviews were collected from stakeholders along with document analysis and written observations by the research team. *Member checks* added rigor to the study by asking participants to examine the findings for accuracy. As participant observers in the field, we engaged in *long-term observation* of the case. *Peer review* also added to validity by submitting early drafts of the research findings to peers for review and feedback.

Lincoln (1999) recommended the terms *rigor* and *adequacy* to address reliability in qualitative research designs. Four criteria for judging rigor and adequacy include *credibility*, *transferability*, *dependability*, and *confirmability* (Guba & Lincoln, 1989, p. 236-243). *Credibility* refers to the accuracy with which the research team has represented the views of the subjects in their conclusions. Credibility was enhanced in this study with prolonged engagement, persistent observations, peer debriefings, progressive subjectivity, and member checks. *Transferability* is only possible when the results of this study can be applied to similar settings. Descriptive details of the case will allow others to decide if the findings are applicable to their situation. This study did not intend to generalize to other populations, but some analytical generalizations may be drawn to the extent that this case resembles the reader's situation (Yin, 1994). *Dependability* refers to the extent to which people not involved in the study can track the research process and determine which raw data were used to reach corresponding conclusions. Detailed records of the data collection process and analyses procedures were kept by the research team, allowing interested people to reference exact quotes and corresponding interpretations. The archived documents and notes all served to strengthen the study's dependability. *Confirmability* refers to the process of checking interpretations and conclusions for researcher bias. Bias can never be completely removed from an individual, but such biases were duly acknowledged during the course of the study and analysis of the findings.

Summary

This paper outlined the work that has been completed at Oklahoma State University regarding collecting stakeholder input for setting research priorities within one academic department. Appropriate modifications to Guba and Lincoln's (1989) *Fourth Generation Evaluation* model (Table 1) were presented and justified. Guba and Lincoln provided the primary framework and operative definitions for the modified model, while others provided direction and modifications that were appropriate for our purposes (Babiuch & Farhar, 1994; Hallett & Rogers, 1994; Laughlin & Broadbent, 1996; Mathie & Greene, 1997).

Without a model for collecting stakeholder input in research priority setting researchers risk losing USDA research funding, as mandated by the 1998 Farm Bill. By having a model to obtain stakeholder input researchers can identify and address those issues needed by the constituency of the land grant institution and thus, strengthen their relevancy.

Recommendations

Given the legislative requirements under the 1998 Farm Bill for including stakeholder input into research priority setting, this model for collecting and implementing stakeholder involvement should be further developed and tested by individual departments of land grant institutions. Refinement and eventual adoption of the model would result in increased accountability for publicly funded research activities, increased communications between land grant researchers and their constituency, and would assist in the identification of research topics that are currently valued by stakeholders.

A top-down movement from the appropriate dean's office is necessary to give the work political and financial support. It is only through the political pressures of voters (PL 105-185) and agricultural college deans that greater accountability will be established among the ranks of the professorate.

The model for obtaining stakeholder input into research priority setting processes advanced in this paper is a complex endeavor, but of great importance for continued public support of the land grant university. Therefore, the college should employ social scientists to implement and facilitate the process and give this effort the highest priority.

Conclusions and Implications

When stakeholders are asked to participate in research priority setting, a greater understanding between groups may result (Mathie & Greene, 1997). Thus, soliciting stakeholder input into agricultural research priority setting can greatly contribute to developing a research agenda that genuinely serves constituents' needs. Such a participatory process adheres to the core values of equity, parity and justice, and can lead to democratic conversations that result in resource and power sharing among participants (Guba & Lincoln, 1989), which in turn leads to greater intellectual and social transformation both among the research community and those who benefit from the newly acquired knowledge.

When colleges neglect to gather a range and salience of stakeholder input for setting research priorities, they put themselves at risk in several ways. Without fulfilling the mandate of the 1998 Farm Bill, colleges risk losing research funding from the USDA. Without stakeholder input, programs will not be sensitive to emerging needs of industry and individual constituents. Without including stakeholders in the research-planning loop, citizens will be underrepresented and underserved by the land grant institutions designed to serve them. Most importantly, the land grant university may risk losing community support and thus subject itself to the criticism of irrelevancy, a claim already made by one vocal agricultural group vested in the land grant university (Dale, 2000).

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Serving Stakeholders at a Land Grant University: Forestry Professors Present Their View Ten Years after Boyer

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Abstract

Faculty roles and responsibilities have shifted over the past three decades from the generalist scholar to the research professor. Generalist scholars were valued for their teaching expertise and ability to communicate research findings to a wide array of audiences. In contrast, research professors must hone their skills in the laboratory or field and are responsible for creating empirically based knowledge for society. Given this shift in role over time, it was imperative to ask the question regarding who is serving stakeholders (those who have a legitimate stake in the outcomes of a program) and how do research professors perceive their responsibility toward serving stakeholders at a land grant university? Findings indicated that faculty roles have indeed shifted within the career span of professors from teachers to researchers. Faculty perceived their role as those who generate knowledge and that it is the extension services' role to serve stakeholders. Faculty had difficulty identifying specific stakeholders of their research, and they collaborate most often with other faculty. The primary mode of communicating with stakeholders was via the peer-reviewed journal article. In its contract with the citizenry of this nation, the land grant university promised to provide teaching, research, and service to all its stakeholders. Research professors have redefined that contract through the evolving promotion and tenure structure, which primarily rewards research activities. If the land grant university is to continue to be the university for the people, then it needs to initiate a cultural revolution where service is truly valued equally with research, and where promotion and tenure committees have the courage to not count journal articles as the principal measure of scholarship.

Introduction

The long-established model of western European higher education implemented in the United States during the 18th and 19th centuries included teaching, research, and service where teaching was considered the most highly prized activity of the academic faculty. Promotion and tenure were based on a broad definition of scholarship, which included teaching and service to the community (Cardozier, 1991). This tradition persisted until the 1950s and 1960s when the expansionist era prevailed. The escalating economy called for academics to become empirical researchers who produced knowledge by collecting large data sets and reported results via journal articles (Lovett, 1986). The new research professor was socialized to become a member of a discipline-based guild, held his/her loyalty to the field of study, rather than the employing institution, and was encouraged to seek national and international recognition as a researcher to earn promotion and tenure.

By the end of the 1960s, the dominant social group on campus was unequivocally the research professor. Scholarship activities were narrowly redefined as systematic inquiry and were measured in terms of quantifiable products such as books, articles in professional journals, and papers presented at professional meetings (Blackburn, et al., 1991; Sundre, 1992). Because of the emphasis placed on research and subsequent peer-reviewed publications required for promotion and tenure, faculty came to view teaching as a competing factor for time with research activities, rather than as a natural outlet for research activities (Fox, 1992).

By the 1970s, larger universities had trouble retaining prized research professors unless they were promised few teaching hours, low numbers of advisees, graduate seminars, research assistants, and generous research and travel budgets (Lovett, 1986). By the 1980s critics of higher education condemned the practices of the research professor, citing that knowledge generated at the empirical level was not cost effective or relevant to the ordinary citizen who supported public universities. State legislatures have echoed public concerns of university irrelevancy by reducing institutional funding levels in order to send a message to the faculty to reexamine their mission and to place more emphasis on undergraduate education (Hunt, 1993). In order to compensate for the reduction in state funding to support research activities, faculty sought funding through external sources such as federal grants and contracts.

Under this pressure, academics began to respond to these circumstances. In 1990 Earnest Boyer, then president of the Carnegie Foundation for the Advancement of Teaching, published <u>Scholarship Reconsidered: Priorities of the Professoriate</u> giving rise to a decade of debate over faculty perceptions toward serving stakeholders in terms of planning and implementing a suitable research agenda, one that benefits the citizens who support the public university. Appropriate stakeholders were defined as those who (a) had a legitimate stake in the outcome of a program, (b) had sufficient program knowledge to contribute to the process in meaningful ways, and (c) had a high self-defined stake in university research outcomes (Greene, 1988). Ideally, stakeholder representation should be based on relative stake in the outcome of a program.

Given the historical context of the shift in faculty roles over time from generalist scholar to research professor, this study sought to capture faculty perceptions toward serving stakeholders at a land grant university in the year 2000. Faculty service in this context referred to the relationship between a faculty member's research agenda (only professors who were actively engaged in research activities were interviewed for this study) and how that research would benefit stakeholders, both directly and indirectly.

Theoretical Framework

The theoretical underpinning of this study rests in an expanded definition of scholarship, one that includes teaching and service as promotable activities and defines scholarship as a variety of creative works measured by the ability to *think*, *communicate*, and *learn* (Boyer, 1990). Boyer (1990) and Rice (1991) discussed scholarship as discovery (research), integration (connecting across disciplines), application (of knowledge to solving public problems), and teaching (bringing new knowledge to learners). Others, such as Pellino, Blackburn, and Bogerg (1984) also suggested six dimensions of scholarship to include professional activities, research and publication, artistic endeavors, community service, pedagogy, and engagement with the novel. Notably, Rice (1991, p. 1) made a compelling argument to "think more creatively about what it means to be a scholar in the contemporary context," asking academics to lay aside the teaching-versus-research debate and redefine scholarship. Calls for a more inclusive definition of scholarship are reminiscent of the early professoriate, the generalist scholar, but more importantly, they signify recognition that not every professor is or should be a researcher (Boyer, 1987). More inclusive definitions of scholarship seek to value other forms of creative work that do not always lend themselves to a peer-reviewed journal article. The findings discuss how one faculty group views itself in terms of the movement away from the research professor to the generalist scholar and implications for colleges of agriculture.

Purpose

The purpose of this study was to discover how research professors perceive their role and responsibility toward serving stakeholders at a land grant university using a grounded theory approach (Strauss & Corbin, 1998). Specific objectives of this study were to establish:

1. How faculty roles and responsibilities have shifted over time.

2. How faculty perceive service toward stakeholders.

3. Whom faculty identify as their stakeholders.

4. Whom faculty collaborate with in research efforts.

5. How faculty communicate with stakeholders.

Research Design and Data Collection Methods

This study utilized qualitative case study methodology (Merriam, 1998) to develop grounded theories (Strauss & Corbin, 1998) surrounding faculty perceptions toward serving stakeholders at the land grant university. One of the most important uses of the case study is to "*explain* the casual links in real-life interventions that are too complex for the survey or experimental strategies" (Yin, 1984, p. 25, emphasis in original). Grounded theory is "derived from the data, systematically gathered and analyzed through the research process" (Strauss & Corbin, 1998, p. 12). Data collection, analysis, and eventual theory are intertwined activities as a result of using this methodology. Data are analyzed and hypotheses are drawn in the researcher's mind as participants are being interviewed. The researchers begin this study with the hope of better understanding faculty connections to their stakeholders. The interpretations and conclusions were derived from the reality of our participant's world, rather than another's conceptions of how things ought to work. When constructing grounded theory, the emphasis is on building rather than testing theory, which leads researchers to consider alternative meanings of phenomena in a systematic and creative process.

Data were collected from January to March 2000 from 12 professors who were actively engaged in research activities. Individual appointments were made and the participants were interviewed in their respective offices during the workday. The interviews lasted less than one-hour each, were audiotaped, and transcribed for verbatim accuracy. Copies of the printed transcripts were sent back to participants for verification of accuracy. Two transcripts were returned for grammatical corrections. All interviews adhered to a flexible interview schedule that was developed in conjunction with the purpose of the study: to better understand how research professors perceived their role and responsibility toward serving stakeholders at a land grant university. No two interviews were exactly alike, but the general line of questioning focused on the faculty's appointment, research agenda, identification of stakeholders, relationship between the research agenda and stakeholders, and communication patterns with stakeholders. The researchers engaged participants in probing questions, which evolved during the interview process to further explore emerging hypotheses.

The data were analyzed following Miles and Huberman's (1994) memoing and matrix techniques and Strauss and Corbin's (1998) methods for developing grounded theory. Fifty-four codes (units of meaning) were developed from the interview data using the qualitative data analysis software program ATLIS.ti (available at www.atlasti.de).

The coded data were then isolated, reviewed, and interpreted by the research team to draw conclusions, which were discussed and negotiated among the research team and with two members of the Forestry Department to increase overall trustworthiness of the conclusions drawn. The process of member checking resulted in several changes in the manuscript that more accurately reflected participant's perceptions.

Because of their focus on a particular situation, case studies are limited in their ability to generalize to a greater population (Yin, 1984). It is appropriate to generalize the results of this study to other academic departments at land grant universities only to the extent that other academic departments resemble this case (Merriam, 1998).

Findings

The sample for this study was drawn from a population of research professors who work for a college of agriculture at a land grant university. All research professors within an academic department (N=12) agreed to participate in the study. One faculty member had a 100% teaching appointment and was not interviewed as this study sought to determine research professors' perceptions. All participants had an earned doctorate in their content areas. Eleven of the twelve were actively engaged in research projects, where the Extension Specialist participated indirectly in research activities with other faculty members (Table 1). Ten faculty members received federal funding for research activities under the McIntire-Stennis Act. All of the participants were male. The average length of service for faculty was 12 years and ranged from 1 month to over 24 years. In order to protect participant confidentiality pseudonyms were used when quoting individuals.

Table 1. *Faculty Rank, Academic Appointment, Years of Service, Research Area, and Reported Stakeholders*

Rank	Research/ Teaching/ Extension	Years of Service	Research Area	*Reported Stakeholders*
Prof.	100/0/0	3	Wildlife ecology	NIPF[1], Ranchers, biologists, hunters, Audubon Society
Prof.	75/25/0	24	Eco-physiology	City tree board, forest mgt., NIPF, Urban Community Forest Council, professional societies
Assoc. Prof.	75/25/0	14	Forest regeneration	Nurseries (state & private), other academics
Assoc. Prof.	70/30/0	18	Forest biometrics	Forest mgt., industry, students, govt. agencies
Assoc. Prof.	70/30/0	18	Silviculture	Forest mgt., govt. agencies, consultants, NIPF, industry
Assoc. Prof.	67/33/0	11	Forest hydrology	Forest mgt., other academics
Prof.	65/35/0	24	Forest genetics	Christmas tree growers, govt. agencies, other academics, industry
Assoc. Prof.	50/50/0	18	Forest economics	Other academics, industry, NIPF, students, govt. and international organizations
Asst. Prof.	40/60/0	1	Forest resources mgt.	NIPF, industry
Assoc. Prof.	25/0/75	9	Wildlife habitat	Ranchers, other academics, wildlife mgt., wildlife biologists, conservationists, govt. and private organizations
Asst. Prof.	0/57/43	0.8	Wood products	Industry
Ext. Sp.	0/0/100	2	Diverse projects	NIPF, youth, private organizations

[1] Nonindustrial Private Forest Landowner

Shift in Faculty Role Over Time

The longer research professors held their faculty positions the more they emphasized research activities over teaching or extension. Table 1 details the academic appointments and research areas of each faculty member who participated in the study. Seven of the nine senior faculty appointments consisted primarily of research responsibilities. The three junior faculty positions were primarily composed of teaching and extension appointments. To confirm the shift in faculty roles over time, we interviewed the department head. He stated, “Junior faculty generally tend to have heavier teaching appointments. Senior faculty often wish to lighten their teaching load to focus on research, writing, and with seniority are more able to effect that transition. The option to create new teaching positions to take the load off senior professors is sometimes employed to avoid overburdening younger faculty; however, restricted budgets often preclude this approach. Those with higher teaching and extension appointments have historically found it more difficult to show recognized scholarship. Thus, the concept of scholarship is in the process of change, which ultimately will result in a broader definition." (K. Smith, personal communication, August 10, 2000).

Faculty research focus shifted over time from applied to basic research. Davis and Irons discussed their personal shift in focus from applied to basic research during the course of their careers. Davis spoke of this trend as a function of the availability of research funding. As he explained it, external funding to do applied research is limited. In time, faculty members learn where the better sources of funding are and then change their research focus to take advantage of more lucrative funding sources. "Some of the work I did when I first came here was directly applicable almost immediately. Now it is more basic, much more long term. There is not much money available to do research at the really applied level. If you want to get the kind of money that I think a big risk program needs, and we're talking about $25-50,000 a year in outside support, you have to go after money that comes from federal agencies." Irons described his shift in more geographic terms. As a new faculty member, his research focused on narrowly defined local issues. As time passed, he became involved with more sophisticated and theoretical research that could be applied nationally and internationally. Irons stated that his work on local issues gave him a general sense of what stakeholder needs were; however, they were difficult to refine into researchable, and eventually publishable problems.

Faculty Perceptions Toward Serving Stakeholders

Faculty perceived a need to serve stakeholders, but cited several barriers to doing so. In discussing service to stakeholders it should be noted that both direct and indirect service activities are included. For example, an indirect service activity may be publishing the applied results of a field trial in a nontechnical magazine; whereas, direct service may include giving a workshop at a growers meeting on best management practices. Jackson, Evans, Foster, Davis, Irons, and Carter made direct reference to their perceptions regarding serving stakeholders and indicated a need to serve both directly and indirectly on some level, but cited several barriers to doing so. Davis reminded us "that an attitude towards service goes along with the land grant institutions." However, the need to publish unique and interesting research results in peer-reviewed journals overshadowed this service attitude for Bailey, Irons, and Kelley.

Faculty perceived applied research as more responsive to stakeholder needs, but identified basic research as more valuable in terms of publishing, and ultimately promotion and tenure decisions. Bailey, Irons, and Kelley discussed basic versus applied research agendas. The chief barrier to directly serving stakeholders was the current promotion and tenure system used by American universities. The heavy weight placed on the number of peer-reviewed publications as a benchmark of efficacy and scholarship left little time for faculty to engage in directly serving stakeholders' needs. Faculty identified applied research as most helpful in addressing nonacademic stakeholder needs, yet expressed concern that papers written on applied research results would not be publishable in the most prestigious venues. This perceived fact has effectively acted as a disincentive to fully serving stakeholders in the applied and basic research domains because spending time on applied stakeholder issues takes time away from basic research activities.

Kelley asserted that his research had served stakeholders as his work involved land management impacts on wildlife, particularly various species of birds that are useful and available to his stakeholders, whom he identified as nature conservation organizations and environmental watchdog groups. In contrast, Irons and Bailey felt that their research was more basic and that they were not as responsive to a particular set of stakeholders (nonacademics). Bailey stated that his career was going to finish up on an issue that would not be popular with stakeholders, yet stressed that this line of inquiry was necessary at the more basic level to gain a deeper understanding of his content domain. Irons noted that the kind of applied research that most directly served stakeholders was not valued under the current promotion and tenure system. "The kinds of things that get published in your journal articles, the highly valued journals in your field, are a long way from what the practice is and there is a big gulf there. So if we are to do research that's closely linked to the needs of the patrons of the university, it would be a different kind of research than we do to get published in refereed journals."

Faculty perceived that being accountable to stakeholders in terms of setting a research agenda would stifle academic freedom. Another barrier to serving stakeholders was the perception that the current trend to increase responsiveness to stakeholders stifles academic freedom. Davis stated that university faculty should be shielded from stakeholders so that they can follow science unfettered by political whims. In contrast, Irons expressed concerns that universities are failing in their role as public servants because researchers have been too protected from the public. Bailey expressed his concern about collecting stakeholder input for determining research agendas and its potential impact on research and the function of the university. "I just want to go on record as saying this is a hideous thing for the government to do (asking faculty to collect stakeholder input for determining the direction of their research agenda) with respect to science. It's like saying science ought to go where the wind blows."

Faculty members did not want to be held accountable to stakeholders. While all of the faculty members felt a need to serve their stakeholders to varying degrees, the idea of accountability to stakeholders was met with open hostility. The general perception was that accountability reduces academic freedom and interferes with the scientific process. The statements made by two faculty members, Davis and Irons, indicated that justifying their work to nonacademics was not productive and their work should be judged solely on its scientific merit without regard to stakeholders who may or may not exist.

The faculty did not all agree about the role of stakeholder needs in setting a research agenda, but there was agreement that it was not entirely their responsibility to gather and distill stakeholder input into researchable problems. Further, it was felt that documentation on stakeholder input, currently utilized for some research funding, was not taken seriously by the administrators who approved Hatch and McIntire-Stennis proposals at both the university and the funding agency.

In general, faculty research agenda decisions were based largely on content specialty and were made independently of stakeholder input. It has been demonstrated that the majority of the faculty who participated in this study valued research over teaching and service activities. Thus, they made a loose connection between their research agendas and serving stakeholders. All faculty members discussed the focus and future direction of their research activities, but only Jackson placed an emphasis on directly soliciting stakeholder input for setting his research agenda. Others discussed potential benefits of their research to stakeholders, but research activities were not driven by the explicitly stated needs of stakeholders. All felt that their work was beneficial to the community, but faculty were not always able to link their research findings to a specific stakeholder group.

Faculty Identification of Stakeholders

The faculty identified nine categories of individuals or organizations that held a legitimate stake in their research and were the focus of faculty service activities. These categories included nonindustrial private forest landowners, government organizations such as the state and federal forest service, private organizations that serve the forest industry, tree farmers, forest managers, other academics, those involved in urban forestry, wildlife conservationists, and students. Subsets of these nine categories of stakeholders included Native Americans, the underserved, and youth.

Nonindustrial private forest landowners (NIPF) emerged as the focus of service for faculty members. A common misconception surrounding the forest industry is that most of the land is owned, operated, or both by mega-corporations, when in fact NIPF own over 70% of the privately held forest lands in the United States. Bailey, Jackson, Foster, Irons, Kelley, Carter, and Martin identified nine types of information required by NIPF. They were wildlife management, hardwood forest management, long-range planning, development of organizations for representation, sustainable management initiatives, general forest management, low-cost regeneration methods, timber marketing, and student service projects. Lee pointed out that most of the private forestry organizations for NIPF began recently, indicating a new focus on this important stakeholder group by the faculty. Before the emergence of NIPF as the dominant group, other researchers held the top position among stakeholders.

Faculty viewed other researchers as an important stakeholder group. Bailey, Evans, Irons, Kelley, and Hunger referred to academic stakeholders both directly and indirectly. Three mentioned the journal audiences in which they publish as users of their research. One researcher indicated that the current system for rewarding scholarship resulted in other academics holding a foremost place among stakeholders. Nine faculty members reported collaborative relationships with other faculty members where faculty shared expertise, equipment, or both. Faculty-to-faculty collaboration was by far the most common type of collaboration mentioned.

Forest managers are perceived as primary consumers of faculty research. Evans, Foster, Kelley, and Carter cited forest and wildlife managers as primary users of their research data. Evans worked primarily on forest growth modeling and indicated that managers used the information he provided. Another researcher indicated that forest landowners and managers, large and small, were beneficiaries of department research. A wildlife biologist identified wildlife managers as his primary audience.

Much of the research generated within the department serves stakeholders that cross state boundaries. Many stakeholders of this department resided outside the state. Rationale was given that forests know no boundaries, and that this state's forest resources overlap two neighboring states. Gray identified a stakeholder group that he was currently serving by providing plant material outside of the state. Four faculty identified government and nonstate agencies in neighboring states as being their primary stakeholders. Another faculty identified regional agencies as his primary stakeholder group. Irons referred to the state's forestry community in general as a stakeholder and specifically identified the Environmental Protection Agency.

In some cases faculty did not clearly articulate who their stakeholders were or whom they should be serving. Two faculty members indicated that they would like to develop relationships with industry (the term "industry" typically refers to mega-corporations). However, Jackson informed us that larger companies "traditionally house their own researchers and there has not been a lot of money available from them." They do not typically collaborate with university faculty. Three faculty either talked of clients that no longer existed or were overly general in identifying stakeholders.

Faculty were not accustomed to identifying who their stakeholders were and cited examples that represented limited interactions with stakeholders. In attempting to tell us about potential stakeholders, one researcher pointed to an isolated contact with an individual and his successful contribution to the development of the stakeholder's consulting business. Six faculty cited private organizations, clubs, and societies that they had served in the past as stakeholders, including organizations that directly related to their area of expertise.

<u>Faculty Collaboration with Stakeholder Groups</u>

Faculty reported that in addition to serving stakeholders through research findings, they had also partnered in significant ways with stakeholder groups, both governmental and private organizations. Evans, Davis, Kelley, and Carter identified the United States Forest Service as a partner in their research activities by providing funding, personnel, resources, and expertise to faculty, thus making significant contributions to faculty research. Three faculty members reported having, or seeking, a partnership with industry and identified various groups as research partners and consumers of research. Lee stated that relationships with industry should be improved as such relationships benefit all parties involved with shared resources.

Faculty Communication Patterns with Stakeholders

Faculty communicated with stakeholders in a variety of ways. Bailey, Lee, Foster, Carter, Martin, and Hunger spoke about communicating with stakeholders. They cited books, newsletters, newspaper articles, attendance at meetings and conferences, visits to industrial plants, and extension offices as avenues for communication. These faculty were most reliant on the printed word to report their work, and assumed that extension educators would interpret and disseminate the outcomes of their research activities for the general public. Carter commented that he tries to write two papers in his head, one he writes for the research audience, the other for the lay audience. In fact, the lay audience paper never actually gets written, but he tries to keep extension specialists informed on what research he is conducting and the implications of his findings.

The principal outlets for research results were peer-reviewed journal articles. By far, the most common approach to reporting the results of research was the peer-reviewed journal article. Time and again, faculty indicated that journal articles were written by scientists for other scientists. As a result, much of the information generated at the university never reaches the majority of stakeholder groups who might benefit from the research.

Formal extension programs aid the faculty in transmitting information to stakeholders. One faculty member discussed directly participating in formal extension programs, and others mentioned that they had participated in extension activities. Faculty reported that extension was the key avenue for satisfying stakeholder needs. For example, the forestry extension specialist developed a Master Woodland Program to train the trainer in best management practices. Kelley reported speaking at one of the sessions and taking participants on a tour of demonstration areas.

Faculty interact directly with nonacademic stakeholders on a limited basis. Bailey and Lee indicated that they had participated in forestry-related symposia and meetings. Bailey, Kelley, and Carter discussed speaking at various functions. In most cases faculty addressed groups that were interested in the faculty's specialty area, such as ranchers who assembled to learn about game bird research and best management strategies for bird populations.

Discussion and Recommendations

While the land grant university was founded on principles of scholarship, which include teaching, research, and service, many faculty have become research professors who are highly engaged in creating new knowledge. The implications of the research professor model are that faculty are focused on a commitment to the profession versus the institution, generating new knowledge regardless of the utilization of that knowledge, and publishing research results in peer-refereed journals. Negative outcomes on a national scale have included a decline in institutional commitment to undergraduate education, excessive specialization, and a proliferation of publications that may not be of much use to stakeholders (Lovett, 1986). One research professor interviewed for this study suggested "the administrators in the university should protect the people doing the basic research from that kind of criticism so that they can go to their lab and do their work without having to worry about the hassles of explaining it." Unfortunately, this type of thinking may lead citizens to rebel against the university culture. If the land grant university is to continue to be the university for the people, then it needs to initiate a cultural revolution where service is truly valued equally with research.

The literature surrounding faculty roles and responsibilities toward serving stakeholders has demonstrated that there are no simple solutions to the acceptance of more inclusive definitions of scholarship. The problem lies in the current academic reward structure where faculty are evaluated on the number of journal articles published, the amount of external funding secured in the form of grants and contracts to support research, teaching activities in terms of load (not quality) and, to a very small extent, service to the community (Hunt, 1993). Even after a decade of debate to redefine scholarship, the results of this study revealed that faculty were not sufficiently motivated to shift from the role of research professor toward generalist scholar as was advocated by Boyer (1990) more than ten years ago. The peer-reviewed journal article remains the defining characteristic of a modern-day scholar. Consistent with their current job descriptions that emphasize research and teaching, faculty were reluctant to devote much time or effort to communicating research results to lay audiences and assumed that to be the role of the extension service.

If the cooperative extension service is to serve as the exclusive voice for interpreting and disseminating faculty research findings to the lay audience, than colleges of agriculture must support more extension personnel to fill the gap between the research professor and stakeholders. One can already hear the cries of the administration for more funding to support such an effort and the counter cries of taxpayers that they are not getting a sufficient return on their investment as it is. Given the fact that budgets must be a zero sum equation, should research professors be replaced by extension staff when attrition occurs? This issue must be seriously pondered by the professoriate, else colleges of agriculture may come to resemble the humanities division, where more than two-thirds of all published scholarship in peer refereed journals is never cited anywhere else (Scott,

1993) as faculty continue with research agendas that have little regard for stakeholders' needs. Boyer (1987, p. 11) has cautioned that public support for higher education is "linked to the tangible idea that the investment should pay off".

As the current trend in legislation has demonstrated, land grant universities must become more sensitive to gathering stakeholder input when setting research priorities. Public Law 105-185 (1998 Farm Bill) required that stakeholder input be collected when setting research priorities. Section 102, item c specifically stated: "Effective October 1, 1999, to obtain agricultural research, extension, or education formula funds from the Secretary, each 1862 Institution, 1890 Institution, and 1994 Institution shall establish and implement a process for obtaining input from persons who conduct or use agricultural research, extension, or education concerning the use of the funds" (Available: www.reeusda.gov/part/areera/).

If faculty are to be held accountable for serving stakeholders, both directly and indirectly, then those activities should be valued equally in status to the peer-refereed journal article when administrators make decisions as to who stays and who goes. Credit should be given to faculty for not only creating new knowledge but for applying it to solving problems. The deeply imbedded culture of publish or perish is foremost on the minds of junior faculty (Hunt, 1993) and will require a great unearthing on the part of college leadership to transform an institution from one of research to one of education and service. The rhetoric is that faculty are to do both, but both are not valued equally.

T. S. Eliot (1939, p. 38) wittily expressed frustration with his colleagues inability to reach a diverse audience in the following statement: "We write for our friends, most of whom are writers, or for our pupils, most of whom are going to be writers; or we aim at a hypothetical popular audience which we do not know and which perhaps does not exist. The result in any case, is apt to be a refined provincial crudity." This sentiment strangely mirrors the findings of this study. Research professors at the land grant universities write for other academics, with the implied, however unrealized, hope that the extension specialist or county extension agent will interpret and disseminate these writings to a popular audience. The result, in this case, is that stakeholders, provincial and sophisticated alike, are still in many regards underserved.

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Florida State Fair Youth Livestock Achievement Program: An Educational Alternative for Youth

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Abstract

This study was conducted to gather perceptions of youth livestock exhibitors toward an achievement program conducted by the Florida State Fair (FSF) during the first two years after initiation. The Achievement Program was applied to all eight youth livestock shows including: Beef Cattle, Dairy Cattle, Dairy Goats, Market Hogs, Market Steers, Poultry, Rabbits and Sheep. Youth have the opportunity to earn achievement points based on their individual efforts, which are translated into monies proportional to their involvement. Youth earn points by attending and participating in various educational events. The top four participants in each show have the opportunity to compete in a Champion event. In 1998, 572 and in 1999, 591 youth participated in the FSF Achievement Program.

Youth participation by age level was similar in 1998 and in 1999 with seniors making up the largest number of entries (54% and 56% respectively). Participants were asked to list the three things they liked the best about the program. For both years, youth liked the chance to earn money and achievement points, the educational aspect/chance to learn and the skill-a-thon as the top three aspects of the program. There was a difference in rankings of items liked best when participants were sorted based on previous state fair participation. Youth who did not participate in the FSF the previous year ranked the educational/opportunity to learn most frequently. Youth who did participate in the state fair the previous year ranked the opportunity to earn money/points most frequently. However, they did indicate that an advantage of showing a market animal in the Achievement Program was the opportunity to earn money based on their knowledge/preparation and that the opportunity to earn money was more evenly (fairly) distributed across all exhibitors.

Introduction/Theoretical Framework

Historically, youth livestock shows have been considered valuable for several reasons. From an animal agriculture perspective, youth livestock shows allow for recognition of superior animals and breeding/production efforts. Through the raising and exhibition of livestock, youth are exposed to the animal agriculture industry and many are motivated to pursue further education and related careers. Competition can be a great motivator and livestock projects afford youth opportunities to develop important life skills. Billings (1980) noted that there is a tremendous advantage associated with competition when it results in the acquisition of knowledge and negative when it detracts from learning.

There is a rich history in youth livestock programming that includes both competitive and non-competitive educational events. Livestock expos, quiz bowls, skill-a-thons, demonstrations, herdsman contests and tours have been used by county faculty, 4-H leaders, agricultural education instructors, and state specialists to teach youth animal agriculture techniques and enhance life skill development (Drew, 1963; Marsh, 1980; Sawer, 1987 & Spike, 1997). The educational events and activities listed above help round out the experience of participation in a youth livestock project. Smith & Collins (1988) echo that one of the most important goals of 4-H and FFA is to provide educational opportunities for youth and note that consideration should be given to competition and it's impact on the educational process. Many awards and recognition programs in the 4-H and FFA are closely linked to competition and the various leadership opportunities associated with youth livestock programs. Each year there are several prominent and highly publicized cases of unethical and illegal practices in youth livestock shows. Billings (1980) noted that historically, competition in youth livestock shows results in a few "winners" and many "losers." Over the past several decades the exhibition of market animals in youth livestock shows has become increasingly competitive. Murphy, Norwood & Dubes (1992) cite the correlation between the intensity of competition and the sale price of the top market animals. This phenomenon has tipped the balance at many shows from an educational experience to a profit-making venture, which in turn has led to occasional incidents of unethical/illegal practices. In 1992, Murphy et al. found evidence of unethical fitting and showing practices in youth/junior livestock shows in Texas. Some examples cited are, use of illegal drugs or chemicals, "altering" genetics, falsifying birth dates, use of custom fitters and physical alterations and abuse. Murphy et al., 1992 attribute these phenomena to the high dollar premiums gained for champion market animals in youth livestock shows. The competition for premiums has tended to shift the objectives for participation in livestock project to a profit-making venture and away from core values and principles that are central to the 4-H and FFA. The media exposure and public perceptions of these events are detrimental to all programs that involve youth.

Another long time concern associated with the ‘show ring’ is the lack of correlation to the ‘real’ livestock industry. This lack of correlation is most evident in market animal shows. The purchase of ‘club’ animals at inflated prices in an attempt to buy the champion coupled with inflated auction prices for a select few leave many with a distorted view of the economics of raising livestock. Many of the practices used to prepare a market animal for show have little to do with standard industry practices for raising an animal for market. From an educational perspective, agents and teachers are placed in a conflict situation when teaching students about industry standards while coaching them on raising show animals.

The Florida State Fair Achievement Program began in 1998 to reward youth for the production, maintenance and showing of quality animals as well as participation in numerous educational events (Florida State Fair, 1999).

Objectives

Specific objectives of the study were to describe the profile and perceptions of youth participating in the 1998 and 1999 FSF Livestock Show and Achievement Program. Research questions compared the differences between perceptions of youth livestock exhibitors based upon previous state fair participation and identified perceptions of youth who previously participated in an auction component of the state fair or a county/state livestock sale toward the Achievement Program.

Materials and Methods

The population for the study was all youth livestock exhibitors that chose to participate in the Achievement Program during the 1998 (N=572) and the 1999 (N= 591) FSF. The researchers developed a one-page survey, which was reviewed for content validity by faculty in the departments of Animal Science and Agricultural Education and Communication. The State Fair Livestock Office mailed the survey to all exhibitors who participated in the market steer, market hog, dairy, breeding beef, sheep, rabbits, poultry and dairy goats divisions after the fair. The survey gathered data on youth participation by division, their level of participation; junior (8-11years), intermediate (12 –14years) or senior (15+ years), the three things they liked best about the program and the three things they would like to see changed in future achievement programs. Perceptions of youth who participated in the market hog and steer auction component of the 1998 state fair and in county/ state fairs were also assessed.

Three hundred thirty seven surveys (58.9%) were returned from the 1998 mailing and 351 surveys (59.4%) were returned in 1999. Descriptive statistics and qualitative analysis were used to analyze the data. Data were analyzed using the Statistical Package for Social Sciences (SPSS, 1999).

Results

Participation by enrollment in specie divisions was similar for both years (Table 1). Youth participated most frequently in breeding beef division (94 in 1998 and 95 in 1999) and least in the dairy goat division (17 and 21), respectively. Rules allow youth enter two specie divisions. Approximately, 47 (14%) in 1998 and 53 (15.1%) in 1999 of the respondents participated in two specie divisions.

Of the youth responding, the majority in 1998 (44%) and 1999 (53%) were seniors, followed by intermediates, 29% (1998) and 24%(1999). Juniors represented 27% of the participants in 1998 and 23% in 1999. Slightly over one- half (54%) of the youth participating in 1998 had previously participated in the state fair youth livestock program and 56% were repeat participants in 1999.

Table 1. *Florida State Fair ChampionYouth Livestock Entries by Specie Division*

1998(N=377)	*1999(N=409)*	
Specie	**Percent**	**Percent**
Beef Breeding	24.9	23.2
Swine	18.0	22.0
Dairy	16.4	14.9
Sheep	9.8	11.0
Rabbits	10.6	9.3
Steer	10.3	7.3
Poultry	5.3	7.1
Dairy Goats	4.5	5.1
TOTAL	**100**	**100**

Youth were asked to list the three things they liked the best about the achievement program. Of the 336 youth responding in 1998: 40% (N=133) liked the money or premiums, 28% (N=95) liked the educational/ knowledge/opportunity to learn aspect and 24% (N=79) liked the skill-a-thon. Slightly less than one-fifth 18% (N=59) liked the volunteering component of the program, 11% (N=37) liked the showmanship/showing component, 4% (N=12) liked the demonstrations/illustrated talks and 7% (N=24) liked the poster component of the program. The 1999 results were similar, but showed an increase in some areas. Approximately one-third (29%) liked the money or premiums and an equal number liked the educational/ knowledge/opportunity to learn aspect. Slightly more than one- fourth, 26%(N=90) liked the skill-a-thon, 23% (N=82) liked the volunteering component of the program, and 20% (N=69) liked the showmanship/ showing component, 9% (N=33) liked the poster and 7% (N=26) liked the demonstration/ illustrated talk components of the program.

One of the most interesting outcomes was in the difference between youth that participated in the state fair in 1998 who had participated in 1997 (no achievement program) and those who were participating for the first time in 1998. Those youth

(N=149) who did not participate in 1997 ranked educational/ knowledge/opportunity to learn as the thing they most liked and those youth who participated in 1997 (N=180) ranked the money/premiums the highest (Table 2).

This trend was similar for the 1999 participants who did not participate the previous year; with the most frequently reported item they liked best being the

opportunity to learn/educational aspect of the program. The opportunity to earn money/points was the most frequently reported item by the 1999 youth that previously participated in the program. However, an interesting pattern emerged in the responses of youth that participated in the achievement program in previous years (Table 2). The 1999 youth who participated in 1998 did not mention the money/points as frequently as their counterparts did in 1998, even though more youth were repeat participants in 1999.

Table 2. *Rank order of item youth liked best about the achievement program summarized by previous state fair participation*

Did NOT Participate in Previous Years			**Did Participate in Previous Years**		
Item	Frequency		Item	Frequency	
1998(N=149) *1999(N=151)*			*1998(N=180)* *1999(N=194)*		
Educational/Learn/Know	45	52	Money/Premiums/Points	90	63
Money/Premiums/Points	41	45	Educational/Learn/Know	48	60
Skill-a-Thon	35	34	Skill-a-Thon	40	57
Volunteering/“ask me”	28	34	Volunteering/“ask me”	31	50
Poster	15	11	Showing	23	36
Showing	14	35	Poster	9	22
Demo/Illustrated	7	9	Demo/Illustrated Talk	7	14

Youth who participated in the market hog and steer program in 1997 (N=51) were asked to list their perceptions of the achievement program in 1998. The overall criticisms of the achievement program from those youth who participated in the auction program in 1997 (market steer and hog) was the inability to earn as much money and that they worked harder in the achievement program in 1998. The positive perception of youth that previously competed in the auction program was that there was more equal distribution of money and they didn’t have to find buyers for their animals.

The 1999 participants who had previously shown a market animal at a county or state fair with an auction or sale were asked to provide their perception on the advantages and disadvantages of the state fair achievement program. Of the 1999 respondents 155 (44%) indicated they had previously entered livestock in a market show that cumulated with an auction/sale. The top three most noted advantages of the state fair achievement program over the auction based market animal sale were: everyone has the opportunity to earn money and/or points (money) can be earned by participation in activities (N=50); educational and knowledge gained (N=25); and that they did not have to find buyers (N=14). The top two disadvantages of the achievement program compared to an auction based market animal sale was that there was not as much profit/money to be earned (N= 64) and there is no means to secure support from community or an opportunity to meet buyers (N= 6).

When asked to provide three suggestions for improvement to future achievement programs, youth in 1998 ranked increased opportunities to earn more points/money, more organization/directions, more time to complete activities and no written/easier test as the top suggested four changes for 1999. In the second year of the program the suggested changes shifted substantially. Youth in 1999 ranked more organization/directions (82 with 34 specific references to the skill-a-thons) as their most frequently suggested change. This was followed by increased opportunities to earn more points/money, more time to complete activities and improved facilities. The request for more educational seminars and information completed the list of the five most suggested changes for 2000 (Table 4).

Table 4. *Participant suggestions to enhance future achievement programs*

Item	**1998**	**1999**
More points/$/opportunities to earn	39	53
More directions/better organized	38	82
Knowledge test (no test - too hard)	38	13
More time/too rushed/too crowded	35	40
Facilities (better/need improvement)	25	40
Auction (reinstate)	19	7
Record book change/judging	19	16
Ability to track score	17	13
More educational seminars/information	10	38

The final question on the survey asked participants if they planned to show again at the state fair. Approximately 82% of the youth indicated they would participate in the program in the future. Sixty-two participants (18%) responded negatively, noting they would not show at the fair in the future. Of those 62, fifty or 81% indicated the reason they would not participate is because they would be graduating (non-eligible) or had other time commitments that would not allow them to participate.

Conclusions /Implications

To try to return to the educational emphasis and intent of youth livestock shows, the Florida State Fair eliminated the traditional “auction” program for top market steers and hogs and instituted an Achievement Program in 1998. The Florida State Fair is held each year in mid-February. The Achievement Program recognizes and rewards youth for exhibiting champion animals and for participation and achievement in an assortment of educational events. Youth have the opportunity to earn achievement points, which are translated into monies proportional to their involvement in these activities (e.g. educational poster, demonstrations, skill-a-thon, written tests, record books, quiz bowls, volunteering to answer questions). Youth participating in this study exhibited animals in the following divisions: market steer, market hog, dairy, breeding beef, sheep, rabbits, poultry and dairy goats.

While the auction component was removed, youth are rewarded for producing market animals; all market steers and hogs were sold above market price. To account for developmental differences in youth there are three levels of competition, junior (age 8-11), intermediate (age 12-14) and senior (age 15+). The maximum age of participation varies depending on the last year of eligibility of youth depending on their enrollment in 4-H or FFA. This program levels the junior livestock economic "playing field" for all youth, regardless of specie, allowing the top competitor in the rabbit division to earn the same savings bond premium as the top market steer competitor.

The point system is unique for each species given the history behind their respective exhibition standards and end use of the animal (market and breeding). For example, market animals receive points for gain in weight; rabbits on the other hand do not have such a category. Following competition in "point" earning events, the total number of points are tallied for each participant by species. In each species the four individuals with the highest points are rewarded. The champion and 2nd, 3rd and 4th place individual in each species division receive, respectively, a $1000 bond, $750 bond, $500 bond and $250 bond. In addition to receiving these bonds the top four exhibitors in each species have the opportunity to participate in a "Champion of Champion" contest. This Champion of Champions contest is a round robin contest that tests the participant's knowledge and skills in the other specie areas. This means, if you were one of the top 4 winners in the market hog division you have to exhibit knowledge and skills in rabbits, breeding beef, market steer, poultry, sheep, dairy and dairy goats. The Champion of Champions wins a $3000 bond with monetary awards (bonds) given to the next 5 high individuals (Florida State Fair, 1999).

From an educational perspective, the Achievement Program enhances and supports the educational programming of county faculty, 4-H leaders, agricultural education instructors and state faculty to include all components of livestock production, industry issues and the development of leadership and life skills.

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Florida Association for Family and Community Education Volunteers: Instructional Implications for Professional Development

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Abstract

Volunteerism permeates many areas of American life. Volunteers contribute substantially to the educational programming and effectiveness of the Cooperative Extension Service. The Florida Association for Family and Community Education (FAFCE) is a volunteer group that works with the Family and Consumer Science program area of the Florida Cooperative Extension Service. Currently, there are approximately 3200 FAFCE volunteers in the state of Florida, and their number is declining annually. Extension agents work closely with these volunteers, yet they receive little formal training on volunteerism. A research study was conducted to explore the demographic characteristics and learning styles of these volunteers.

Three of the five Florida Cooperative Extension districts in the state of Florida participated in this study. A demographic questionnaire and a learning styles assessment test were administered to volunteers attending meetings in January to April, 1999. Two hundred seventy-four FAFCE volunteers participated in this study. The mean age of these FAFCE volunteers was 71 years of age, with a range from 49 to 90 years of age. The majority of the volunteers were Caucasian females. Slightly under one-half (42%) of volunteers reported they have received some form of professional development as a FAFCE volunteer. As a group FAFCE volunteers were field dependent. The median GEFT score for FAFCE volunteers was 2.0, with GEFT scores ranging from 0 to 18.

Findings from this study provided useful insight and baseline data on the FAFCE volunteer program. Professional development for agents and state specialists should include a variety of instructional strategies and techniques to ensure successful transition of information, thereby meeting the preferred learning needs of all participants

Introduction/Theoretical Framework

Volunteers are used in all areas of extension, including Family and Consumer Science, 4-H, Horticulture and Agriculture, with the majority of volunteers working in the 4-H youth development program area. Florida county extension agents and state extension specialists work directly with volunteers and are responsible for a myriad of volunteer training and management programs. Therefore, an effective volunteer management-training program needs to address both principles of volunteer management and how to effectively deliver instruction or educate clientele.

Snow and Yallow (1982) note that the success of education is dependent on the adaptation of teaching to the learning differences among learners. Effective transition of information from the extension agent and/or specialist to the volunteer is necessary for a successful program.

Over the years, researchers of volunteerism have come up with some core competencies necessary to ensure a successful volunteer program. From these core competencies and theories, certain individuals have developed models for implementing a successful volunteer program. One of the main components of volunteerism is orientation and training (Brudney, 1990; Campbell & Ellis, 1995; Naylor, 1973; Rauner, 1980; Scheier, 1985; Vinyard, 1981; Wilson, 1976).

Brudney (1990) feels that volunteers need training and supervision in order to do their job effectively. Training gives volunteers the skills and knowledge needed to perform their work well and effectively (Wilson, 1976). Wilson (1976) is of the belief that orientation is only the beginning of training for the volunteer, although too many agencies think that orientation is the only training needed for volunteers. Rauner (1980) describes three types of training for the volunteer: pre-service, or orientation training, prepares the volunteer to begin the job; in-service training provides for a better understanding of the scope of their job; and continuing education includes training not related to a specific subject or job. Training for volunteer leaders will allow them to increase their skills, and in turn, offer more potent training to the volunteers (Rauner, 1980). It is important that volunteers receive effective training because poor training can harm the organization by decreased productivity in volunteers, a possible loss of volunteers, and by decreasing the image of the organization (Naylor, 1973).

Naylor (1973) notes that traditionally, training primarily included instruction solely on skills necessary to perform the specific task or job, but educators have disagreed, as this type of training lacks in providing for individual volunteer learning needs. It is important to break down the content information into teachable parts, so the volunteers are able to comprehend all aspects of the training. To successfully do this skilled trainers need to utilize a variety of teaching techniques and methods in training (Naylor, 1973).

If learning is a positive experience, then an individual strives to learn more, as they are motivated to further their learning. Research shows that knowing about yourself and your audience will help you in your teaching and working with others. Learning styles are "characteristic cognitive, affective and physiological behaviors that serve as relatively stable indicators of how learners perceive, interact with and respond to the learning environment" (Keefe, 1987, p. 4). This supports the premise that educators should select a variety of strategies to assist the learning styles of the audience. This will result in a multifaceted and effective program that will appeal to more than one learning style at a time (Sarasin, 1998). The Ontario Ministry of Agriculture, Food and Rural Affairs (2000) note that it is important to match the learning styles of volunteers with appropriate training methods in the volunteer management process.

Boone (1985) feels that appropriate methods, experiences, and materials must be selected when implementing a planned program. "Learning theory, as it may apply to adult learners, is basic to the choice of learning materials and methods" (Boone, 1985, p. 234). This emphasized the need to match certain learning technologies to the needs and socio-cultural characteristics of the audience.

In the 1940s, Witkin initiated research on cognitive style with studying the perceptions of individuals in different spatial orientations. He unexpectedly found that people differed by how they use orientation tasks (Witkin & Goodenough, 1981). Witkin (1976) later characterized these perceptual characteristics among individuals as field dependent or field independent. His basic premise is that individuals differ in their learning styles and individuals tend to teach according to their learning style. By recognizing these differences in learning styles, one can adapt their instruction to meet the needs of all learners (Witkin et al., 1971). Field dependent learners are global learners who prefer structured educational settings. They tend to have highly developed social skills and are aware of their social environment (Garger & Guild, 1984). Field independent learners are more likely to be analytical and perceptual learners who prefer to structure their own educational settings. They may have less developed social skills and are interested in concept attainment, with the ability to distinguish differences among concepts (Garger & Guild, 1984).

Witkin et al. (1971) found consistent gender differences by field dependence, with women tending to be more field dependent then men. This is supported by many research studies (Cairns, Malone, Johnston, & Cammock, 1985; DeRussey & Futch, 1971; Morf, Kavanaugh, & McConville, 1971; Parlee & Rajogopal, 1974; Saarni, 1973; Sherman, 1974; Takigami, 1975). However, current research by Rudd, Baker and Hoover (1998) and Baker, Rudd, Hoover and Grant (1997) dispute this finding. Demick (1991) believes further study is needed in this area, due to the argument that many of these studies supporting gender differences by field dependence show only a low statically significant effect.

There is some evidence of a relationship between age and field dependence. Comalli (1965) and Schwartz and Karp (1967) found that older aged individuals tended to be more field dependent. After the late 30s, individuals tend to lean toward field dependence (Comalli, 1965; Schwartz & Karp, 1967).

Recent research disputes this finding (Panek, 1985; and Takigami, 1975). Panek (1982) who utilized the GEFT and a personality test on women age 60-81 suggests increasing age may have an effect on personality relationships. Knox (1981) notes that the transfer of learning tends to decline with age.

Baker et al. (1997) found that the Extension professionals tended to be field dependent learners. The researchers recommended that any training delivered to this group include techniques to appeal to field dependent learners such as the opportunity for social exchange, and a structured learning environment (Baker et al., 1997).

Because Florida Extension volunteers make such an impact on the state of Florida, it is imperative that volunteers are successfully delivering their educational programs. This reinforces the need to provide volunteers with instructional techniques and teaching strategies. Snow and Yallow (1982) note that the success of education is dependent on the adaptation of teaching to the learning differences among learners. Therefore, an effective volunteer management-training program not only should address the principles of volunteer management but also how to effectively educate clientele.

Purpose and Objectives

The purpose of this study was to determine learning styles of FAFCE volunteers with the ultimate goal of sharing results and providing instructional methodology recommendations to agents and state specialists for inclusion in volunteer training. The objectives were to do the following: 1) Determine the demographic characteristics of FAFCE volunteers, 2) Identify current informal and formal volunteer training programs for FAFCE volunteers and, 3) Determine the learning styles of FAFCE volunteers.

Methodology

Population

The sample for this study consisted of a select group of Florida Association for Family and Community Education (FAFCE) volunteers in the state of Florida, along with the county extension agents that work with FAFCE volunteers. There are approximately 3,200 FAFCE volunteers in the state of Florida located throughout five regional districts. A purposeful sample of volunteers and agents was taken from those attending Districts II, III and IV meetings. The findings of this study are limited to the FAFCE volunteer who participated in this study. Additionally, FAFCE volunteers who participated in the study represented individuals who were motivated to attend District II, III and IV meetings during 1999. The total sample for this study was 274 FAFCE volunteers. Two survey instruments were utilized for the study, a researcher developed questionnaire and the Group Embedded Figures Test (GEFT) (Witkin et al., 1971). The researcher-developed questionnaire was used to collect demographic information pertaining to FAFCE volunteers. The GEFT was used to determine the learning styles of the FAFCE volunteers in the study. Faculty in Agricultural Education and Communication and Program

Development and Evaluation reviewed the researcher-developed instrument for content and face validity.

Learning styles were measured by the GEFT (Witkin et al., 1971). The GEFT was designed to allow for a large number of individuals to be tested in one testing session (Witkin et al., 1971). The national mean score for the GEFT is 11.4, with those scoring below 11.4 considered field-dependent, while those scoring above 11.4 considered field-independent (Witkin, et al, 1971). The GEFT was based upon the Embedded Figures Test (EFT); the EFT reliability estimates are favorable with a reported reliability coefficient of .82 for both males and females (Witkin, et al, 1971).Data CollectionData Collection The questionnaire and GEFT were administered to the sample of the between January of 1999 and continued through April of 1999. Final numbers of participants in the study include 273 FAFCE volunteers.

Data Analysis

Data were analyzed using the Statistical Package for the Social Sciences for Windows Release 9.0 (SPSS®, 1999). Percentages and frequencies were calculated to develop a descriptive profile of the population. GEFT scores were measured with age of the selected sample through bivariate correlation.

Results/Findings

Demographic Characteristics of FAFCE Volunteers

Two hundred seventy four FAFCE volunteers participated in this study. An additional 34 individuals completed the survey and reported their role as something other than an FAFCE volunteer or extension agent, these individuals were not included in the analysis.

Eighty-seven percent (87.2%) of FAFCE volunteer respondents were female, while 7% were male and 12 % did not select a gender. Nine out of ten (90%) volunteer respondents were Caucasian/White, 6% were African American, and 4% were Native American. One individual in the study was Hispanic, one individual was West Indian, and one individual did not respond.

The mean age of these FAFCE volunteers was 71 years of age, with a range from 49 to 90 years of age. Twenty-four volunteers failed to report their age.

Individuals in the sample were asked to identify their educational level. Of the 268 volunteers that responded to the question, “Please indicate your highest degree completed,” 6% said some high school, 44% had a high school degree, 31% attended some college, 3% had earned an associates degree, 8% earned a bachelors degree, and 6% of volunteers surveyed had a graduate degree.

FAFCE volunteers and extension agents involved in the study represented three of the five extension districts in the state of Florida: Districts II, IV, and V. The FAFCE volunteers in the study represented 24 of the 67 counties in Florida.

Current Informal and Formal Volunteer Training Programs for FAFCE Volunteers and Extension AgentsCurrent Informal and Formal Volunteer Training Programs for FAFCE Volunteers and Extension AgentsCurrent Informal and Formal Volunteer Training Programs for FAFCE Volunteers and Extension Agents

The FAFCE volunteers were asked, "Have you received training as a member of FAFCE?" Just under half (42%) of volunteers reported they have received training. Twenty-percent of the volunteers did not respond to this question. Those that participated in training noted they participated in a variety of trainings (10%), leadership training (8%), educational/specific topic training (7%), Family Community Leadership (FCL) (6%), officer training (3%), monthly training (1%), working with youth (1%), and county level training was mentioned by one participant.

Respondents were asked to report the individual or group who hosted the training. Sixty-five percent of FAFCE volunteers did not respond to this question. Twenty percent of training was reported as given by county level agents (19%). Other trainers included FAFCE member (4%), University of Florida (3%), a variety of trainers (3%), state specialists (2%), leader trainer (2%), FCL staff (1%), and volunteers (1%). The following trainers were also mentioned: club president, community leaders, and both national and state officers.

Learning Styles of FAFCE Volunteers and Extension Agents

As a group FAFCE volunteers were field dependent. The median GEFT score for FAFCE volunteers was 2.0, with GEFT scores ranged from 0 to 18(Table 1).

Table 1. *GEFT Scores for FAFCE Volunteers*

	FAFCE Volunteers (n=264)
Mean score	2.84
SD	3.08
Median	2
Minimum	.00
Maximum	18

Correlational analyses were conducted with the variables of GEFT score and age. The correlation for the dependent variable, GEFT score, with the independent variable, age, can be observed in Table 2. A significant low negative correlation was found between age and GEFT score (r=-.17, p=.008). Two additional correlations were run to see if the age of volunteer above and below the mean age could predict GEFT scores. FAFCE volunteers were separated into two groups for this analysis. There were no significant correlations between age and GEFT score for FAFCE volunteers who were 71 years of age and younger (n=108), and those above 71 years of age (n=132).

Table 2. *Correlation for the Dependent Variable, GEFT Score and the Independent Variable, Age, Age < 71 and Age > 71*

Variable	N	Correlation[1]	p-value
Age	240	-.17*	.008
Age $\leq$ 71	108	-.02	.818
Age >71	132	-.14	.121

*Significant at p<.01
[1] Pearson product moment correlation

Conclusions

Results of the demographic portion of the survey indicate that the majority of the FAFCE volunteers were Caucasian, females with an average age of 71 years. Most of the volunteers do not work outside the home (92%). Almost half of the volunteers earned a high school degree, and almost one-third attended some college.

Forty-two percent (42%) of volunteers noted they received training as a member of FAFCE. Major training received included: a variety of training (10%), leadership training (8%), educational/specific topic training (7%), and Family Community Leadership (6%). The most significant responses to the individual responsible for the training include county extension agents (19%), Family and Consumer Educator (4%), University of Florida (3%), a variety of trainers (3%), state specialists (2%), and leader trainer (2%). Brudney (1990) believes that training coordinates the motives and needs of the volunteers, the organization, and clientele. Naylor (1973) notes that lack of training can decrease productivity in volunteers, decrease the image of the organization, and the organization can loose volunteers as a result. Not only is it important to provide current technical content to volunteers, it is equally important that trainers use a number of methods and teaching techniques in training (Naylor, 1973).

The assessment of learning styles indicated that the median GEFT score of FAFCE volunteers was 2.0. This indicates that FAFCE volunteers field dependent learners. There was a low negative correlation ($r = -.171$, $p = .008$), between age and GEFT score for FAFCE volunteers. As age increases, scores go down. The direction of the relationship is consistent with literature; however, the relationship observed is very weak and does not explain a great deal of variation in the model. The findings of this study do not contribute substantially to the research by (Comalli,1965; Schwartz & Karp, 1967) that show as individuals' age, they tend to exhibit increasing field dependence.

The majority of individuals in this study were field dependent women, which supports the research that shows a relationship between field dependence and gender (Cairns, et al., 1985; DeRussey & Futch, 1971; Morf, et al., 1971; Parlee & Rajogopal, 1974; Saarni, 1973; Sherman, 1974; Takigami, 1975). However, an equivalent comparison group of males was not available for analysis. Therefore, we can not attribute the field dependence of the group solely on gender.

Implications

The results of this study affect FAFCE volunteers, extension agents, state specialists, and the Florida Cooperative Extension Service. The findings of this study suggest specific volunteer leadership and training issues that should be addressed in relation to FAFCE.

Orientation and Training

For example, less than half of FAFCE volunteers (42%) reported they received training, and 20% did not even respond to this question. For volunteers to carry out the mission, handle subject matter, and educate individuals in the community, they must receive adequate training.

Efforts should be made to increase training and workshops for FAFCE volunteers. This reaffirms the need and rationale that FAFCE volunteers are a viable constituent group that should be served by UF/IFAS, Florida Cooperative Extension Service faculty, both at the county and state level. There is a continued need for agents to deliver educational programs and training to volunteers. Agents must be conscientious and understanding of learning styles in an effort to deliver effective programs.

Given the value and importance of FAFCE volunteers representing UF/IFAS Florida Cooperative Extension Service, the effort and input focused on professional development for volunteers can enhance their effectiveness in delivering programs to the clients in the state of Florida. Therefore, it is imperative to offer professional development to both our state specialists and agents and subsequently our volunteers, in an effort to deliver effective programs to the state of Florida. Witkin (1976) notes that individuals differ in their learning styles and they tend to teach according to their learning style. By recognizing these differences in learning styles, one can adapt their instruction to meet the needs of all learners.

Additionally, training regarding instruction, including how to recognize differences in learning styles should be addressed, as these volunteers in turn educate and teach in their communities. It is vital for them to understand and appreciate different learning styles and for them to utilize a variety of teaching methods in their volunteer programs. By accommodating the unique learning styles of all learners, this will greatly increase the successful transfer of information

This effort will provide volunteers, county faculty, and state specialists with a variety of instructional strategies and guidelines for program delivery. The ultimate goal is to make the volunteers better educators and trainers within their communities and consequently enhance the effectiveness and image of UF/IFAS. Boone (1985) states that volunteers should not be over looked because volunteers are representatives of the organization that can acquire and disseminate information to the public, and they extend the resources available to the organization.

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Pre-Service and In-Service Needs of Beginning Agriscience Teachers Supervising Livestock SAE's

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Abstract

Agriscience teachers in Texas place a great deal of emphasis on agriculture programs and SAE's which are primarily geared toward livestock show projects. The purpose of this study was to determine the pre-service and in-service needs of beginning agriscience teachers in Texas for supervising SAE's involving livestock projects.

The design for the study was descriptive. A random selection of 145 beginning agricultural science teachers (1 year to 5 years) in Texas were surveyed in order to determine if they possessed any skill, ability, or scientific application deficiencies in the specified area of SAE livestock show programs. The data were collected by mailed surveys with a response rate of 57.7%.

The findings of the study were as follows:
1. The average beginning agri-science teacher in Texas had been teaching for 2.53 years and 2.52 of these years were in the schools where they were currently working.
2. The average beginning agriscience teacher was 29 years old.
3. The respondents reported the average agriscience program with beginning teachers in Texas had an enrollment of 123.4 students.
4. Beginning agriscience teachers believed that they were the least knowledgeable about poultry and rabbits and the most knowledgeable about goats and beef cattle.
5. The agriscience teachers had the least amount of years of participation with rabbits and poultry and the most years of participation with goats and beef cattle.
6. Beginning agriscience teachers in Texas found it difficult to select, purchase, feed and care for quality show rabbits, but much less difficult to select, purchase, feed and care for quality beef cattle and swine.
7. The most frequent stock show problems faced by beginning agriscience teachers were parents, making travel arrangements and getting students and livestock to different locations.

Introduction

Agriscience teachers in Texas place a great deal of emphasis on agriculture programs which are primarily geared toward livestock (Kieth, 1997). Dyer and Osborne (1995) stated that in Areas I and II in Texas, five percent of the agriculture departments reported every student was involved in an SAE program. This emphasis is due to the continuing competition in major stock shows, county, and local stock shows around the state.

It has long been proven there is a positive relationship between a quality SAE program and the influences they have on students. Teacher experience plays a role in student participation, and their knowledge and understanding of SAE is another factor research has reported to be related to SAE quality. Another teacher characteristic related to SAE effectiveness is teacher commitment to teach about SAEs in the classroom. Gibson (1987) reported a positive relationship between SAE program quality and the amount of classroom instruction on SAEs. Johnson, Lindhardt, and Stewart (1989) reported that beginning teachers considered conducting SAE programs, which include livestock shows, to be one of their highest priorities.

Other research related to SAE has also attempted to identify factors that contribute to SAE effectiveness. One of these factors is previous enrollment in high school agriculture by the teacher (Anyadoh, 1989). Several studies have focused on the identification of teacher characteristics associated with SAE program quality, and the amount of supervision provided by teachers has probably been studied more than any other factor. Many of these studies have confirmed the positive relationship between the amount of supervision (supervision visits) and SAE program quality and/or scope (Harris, 1983; Gibson, 1987; Anyadoh, 1989).

Although many studies have been conducted to show both presevice and in-service needs of beginning agricultural science teachers, Claycomb and Petty (1983) concluded that the in-service needs of beginning teachers change over time. Furthermore, Birkenholz and Harbstreit (1987) stated that the in-service needs of beginning agricultural teachers should be assessed and prioritized on a continual basis.

Theoretical Framework

One important factor research has found as related to SAE, is teacher knowledge and understanding of SAE (Hoover & Arrington, 1994). Anyadoh (1989) found another positive relationship to SAE quality to be previous enrollment in high school agriculture classes by the teacher. Gibson (1987) found one final characteristic of the teacher related to SAE effectiveness to be teacher commitment to teaching about SAE in the classroom. A positive relationship was present between SAE program quality and the amount of instruction on SAE in the classroom.

Lambreth (1986) reported some inhibiting factors to be a lack of agricultural background, inadequate resources, and large student-teacher ratios. Other barriers to SAE effectiveness were found to be a lack of facilities, low student desire, inadequate teacher time for supervision, student participation in other school activities, and various economic factors.

Ingersoll (1996) said that one of the most important characteristics of a qualified high school teacher is college training in the subject in which he or she teaches. Also, Dillard (1991) stated, it is hard to teach subjects for which you are not prepared for. And Schumacher (1993) said that teachers teach what they know.

Research by Shippy (1981) and Mundt (1994) concluded beginning teachers perceived their highest needs to be in the areas of program planning, development, and evaluation; planning, execution and evaluation of instruction; and managing student behavior. Kahler (1974) claimed beginning teachers' needs are somewhat different from those of the experienced teacher.

Cox (1985) stated due to lack of experience, demands on the undergraduate students to learn the competencies necessary to effectively carry out the FFA advisor role can become overwhelming.

Dyer and Osborne (1995) reported teachers claim to support SAE, however many fail to implement the programs fully, resulting in decreased student participation. The researchers also stated a high priority for beginning teachers is conducting SAE programs, but little relationship exists between their actual performance and their perceptions. The researchers recommend universities offer beginning teacher induction programs to assist beginning teachers in developing quality SAE programs.

Garton and Chung (1997) stated agriculture teachers have had and continue to have needs for in-service education. The researchers also reported that SAE development and supervision ranked in the top ten most important needs of agriculture teacher in-service training.

In 1987, Birkenholz and Harbstreit found the greatest need for in-service training to be in the areas of computer in the classroom, training agriculture/FFA contest teams, developing skills in agribusiness management and electricity, and assisting students with SAE records.

Shelhamer and Bishop (1985) conducted a study in which Montana employers were asked to identify personal characteristics that make people more employable in agribusiness. Over 45 percent of these employers preferred some type of FFA involvement. Agricultural employers preferred employees that had a strong academic background and had participated in extracurricular activities such as FFA SAE programs.

In Hankes' 1996 study, she reported that Houston Livestock Show and Rodeo exhibitors of champion livestock used their moneys to further their education. Over 50 percent of these exhibitors earned a bachelor's degree, while 93 percent have post high school education. Also, program completers of vocational agriculture have an employment rate of 99 percent.

The theoretical framework for this study provides evidence that Supervised Agricultural Experience (SAE) programs are an important teaching and learning tool that helps students develop skills and abilities leading toward a career. Previous research has also shown that a teacher's effectiveness often determines the success of an SAE program. However, the teacher's effectiveness is dependent upon the amount of training the teacher had in the specific area, therefore suggesting a need for in-service and pre-service training for agriscience teachers.

Purpose/Research Questions

Agricultural science teachers in Texas have the responsibility of advising, making recommendations, and selecting quality animals for the students' livestock show project. It is imperative that teachers in Texas stay current with research and new and improved methods of instruction. If agricultural science teachers are not competent in the area of livestock show programs, they will not be able to deliver an acceptable quality of instruction to their students.

The purpose of this study was to determine the pre-service and in-service needs of beginning agriscience teachers in Texas for supervising SAE's involving livestock. These needs will be used to determine any changes that should be made in curriculum/training and in-service programs.

As a means of accomplishing this purpose, answers to the following questions were sought:

1. What are the demographic variables of beginning agricultural science teachers in Texas?

2. What level of knowledge and past participation with livestock show projects do beginning agricultural science teachers possess?

3. What past exposure to livestock show programs do beginning agricultural science teachers possess?

4. Do beginning agricultural science teachers have the perceived ability to select and purchase quality show animals?

5. Are beginning agricultural science teachers familiar with feeding and care of livestock?

6. What are other problems associated with livestock show programs?

Research Procedures Used

The design for the study was descriptive. Beginning agricultural science teachers(1 year to 5 years) in Texas were surveyed in order to determine if they possessed any skill, ability, or scientific application deficiencies in the specified area of SAE livestock show programs. In addition to demographic and open-ended questions, data were collected using Likert-type questions. The data were collected by mailed surveys from a sample of beginning agricultural science teachers in Texas.

The target population in this study was beginning agricultural science teachers that were teaching in the state of Texas. A sample of 145 individuals were randomly selected from a population of 290 beginning teachers. These individuals represented all parts of the state. Procedures were followed according to Dillman (1978) for controlling for non-response.

The survey instrument used for the collection of data was a questionnaire to determine the level of knowledge possessed by the instructors of SAE livestock show programs. The questionnaire was developed by the researcher following interviews of instructors at both the San Antonio and Houston Livestock Shows and an extensive review of related literature. The instrument was designed by the researcher using the Total Design Method (Dillman, 1978).

Part I of the survey collected demographic information that determined the dependent variables. Part II of the survey consisted of six parts. The first was a five-point scale to determine the participants' level of knowledge with 5 being very knowledgeable and 1 meaning no knowledge. Past participation was also determined in this section by simply filling in the number of years of participation. The next sections: high school and university exposure, selecting ability, and care of seven different common animals found in Texas show programs were all on five-point scales. There were 10 questions dealing with other problems that were answered by circling either yes or no. Two additional open-ended questions were included to determine problems with parent involvement and any other types of problems instructors might have experienced with show programs.

Surveys were mailed on April 2, 1999. Using standard follow-up methods, a 57.7% response rate was achieved by June 4,1999. Any questionnaires received after this date were considered non-respondents. Statistical analysis was completed using SPSS on a Macintosh computer system. Descriptive statistics were used to summarize the data pertaining to: (a) the demographic variables of beginning agriscience teachers in Texas, (b) their level of knowledge and past participation with livestock shows, (c) the past exposure Texas agriscience teachers have to livestock show programs, (d) their ability level to select and purchase quality show animals, (e) their familiarity with feeding and caring for livestock, and (f) other problems associated with livestock show programs.

Findings

Over one-third of the respondents (35.1%) had only been teaching agriscience one year. Slightly over 15 percent had been teaching two years and 23.4 percent indicated they had been teaching three years. Thirteen percent indicated they had been teaching for four years and 13 percent had been teaching 5 years as well. The mean years teaching was 2.53 and the median was 2.0 years.

Thirty-four percent of the teachers had only been at their school one year. Almost one-fifth had been at their current school two years and 22.4 percent have been there three years. Slightly over 14 percent had been at their current school four years and 9.2% have been there five years. The mean years at their current school was 2.52 and the median was 2.0 years.

The largest percentage (41.8%) of the teachers were between the ages of 27 and 31. Over one-third (36.7%) were between the ages of 22 and 26. Nine percent were 32 to 36 years of age and 5.2 percent were between 37 and 41. Slightly over three percent were between 42 and 46 and only 1.3 percent were between 47 and 51. There were no beginning agriscience teachers between the ages of 52 and 56 and only one was in the age group of 57 to 61 years of age. The mean age of the beginning agriscience teachers was 29.2 and the median was 27 years.

The majority of agriscience departments had between 1 and 100 students in their programs. Slightly over 40 percent of the agriscience departments had between 101 and 200 students enrolled and 3.8 percent had an enrollment between 201 and 300. Only 5.2 percent had between 301 and 400 students enrolled and 1.3 percent had between 401 and 500. The mean current enrollment was 123.4 and the median was 101.5.

Agricultural science teachers were asked to respond to the level of knowledge and years of past participation for seven different types of show animals. These included beef cattle, dairy cattle, sheep, swine, goats, rabbits, and poultry. The level of knowledge was answered using a five-point Likert-type scale where 1=No Knowledge and 5=Very Knowledgeable.

Table 1 shows that beginning agricultural science teachers possessed the least amount of knowledge in the area of poultry with a mean of 1.9. Following in order of knowledge level were rabbits (2.49), dairy cattle (2.52), swine (2.59), and sheep (3.26). Respondents indicated they had the highest levels of knowledge in goats with a mean of 3.84 and beef cattle with a mean of 3.80.

Table 1. *Level of knowledge of livestock*

Animal	M
Goats	3.84
Beef Cattle	3.80
Sheep	3.26
Swine	2.59
Dairy Cattle	2.52
Rabbits	2.49
Poultry	1.90

Note: Higher means indicate higher level of knowledge.

Table 2 shows the results of the question about years of past participation. The animal that respondents had the least years of participation with was rabbits with a mean of 3.54 years, followed closely by poultry (3.62 yrs.) and dairy cattle (3.73 yrs.). Next in years of participation was swine (4.68 yrs.), sheep (5.36 yrs.), goats (5.92 yrs), and finally beef cattle with 7.27 years of participation.

Table 2. *Years of participation in livestock show programs*

Animal	M
Beef Cattle	7.27
Goats	5.92
Sheep	5.36
Swine	4.68
Dairy Cattle	3.73
Poultry	3.62
Rabbits	3.54

Note: Higher means indicate more years of participation.

Table 3 lists the years of high school exposure to the animals by the participants in the study. Respondents reported having the least years of exposure to goats (0.67 yrs) followed by rabbits (.85 yrs.), dairy cattle (1.36 yrs.), poultry (1.58 yrs.) , and sheep (2.09 yrs). Respondents had the most exposure to swine with 2.73 years of participation and beef cattle with 2.79 years.

Table 3. *High school exposure to livestock*

Animal	M
Beef Cattle	2.79
Swine	2.73
Sheep	2.09
Poultry	1.58
Dairy Cattle	1.36
Rabbits	.85
Goats	.67

Note: Higher means indicate greater exposure.

Table 4 lists the college semesters that the participants had exposure to the different animals. Respondents had the least amount of exposure to rabbits with .46 semesters, followed by goats (0.67), poultry (1.03), dairy cattle (1.08), and sheep (1.71). Participants had the most university exposure to swine and with 2.17 semesters and beef cattle with 2.36 semesters.

Table 4. *University exposure to livestock*

Animal	**M**
Beef Cattle	2.36
Swine	2.17
Sheep	1.71
Dairy Cattle	1.08
Poultry	1.03
Goats	.67
Rabbits	.46

Note: Higher means indicate greater exposure.

Agriscience teachers were asked to rate their ability in selecting and purchasing quality show animals for show programs. A five-point Likert-type scale was used to determine their ability level where 5=Very Able and 1=Not Able.

Table 5 describes the ability level of the participants to select and purchase quality show animals. The survey shows that the participants felt they had the least ability in selecting and purchasing quality show rabbits with an ability level of 2.08. Following rabbits were dairy cattle (2.58), goats (2.73) and poultry (2.87). Participants felt they were more able to select and purchase quality beef cattle with an ability rating level of 3.94 and swine with a 4.04.

Table 5. *Livestock selection and purchasing ability*

Animal	**M**
Swine	4.04
Beef Cattle	3.94
Sheep	3.39
Poultry	2.87
Goats	2.73
Dairy Cattle	2.58
Rabbits	2.08

Note: Higher means indicate higher ability.

Agriscience teachers were asked to rate the level of difficulty they had in selecting and purchasing quality show animals for show programs. A five-point Likert-type scale was used to determine their level of difficulty where 5=Very Difficult and 1=Not Difficult. Table 6 describes the participants' level of difficulty experienced in selecting and purchasing quality livestock show animals. Participants experienced the most difficulty when selecting and purchasing rabbits with a difficulty level of 3.65 and dairy cattle with a level of 3.55. The next most difficult to select and purchase were goats (2.95), poultry (2.97), and sheep with a 2.86. They indicated that they experienced the least difficulty selecting and purchasing beef cattle with a 2.61 level of difficulty and then swine with a 2.40.

Table 6. *Livestock level of difficulty*

Animal	**M**
Rabbits	3.65
Dairy Cattle	3.55
Poultry	2.97
Goats	2.95
Sheep	2.86
Beef Cattle	2.61
Swine	2.40

Note: Higher means indicate more difficulty.

Agricultural science teachers were asked to respond to their familiarity with feeding and care of the different livestock show animals. A five-point Likert-type scale was used to describe their abilities.

Table 7 describes the participants' familiarity with feeding show animals. Participants were least familiar with feeding rabbits 2.54. Following rabbits were dairy cattle (3.01), goats (3.13), poultry (3.38), and sheep (3.66). Participants were most familiar with the feeding of beef cattle (4.17) and swine with a 4.29 familiarity rating.

Table 7. *Familiarity with feeding of SAE livestock projects*

Animal	**M**
Swine	4.29
Beef Cattle	4.17
Sheep	3.66
Poultry	3.38
Goats	3.13
Dairy Cattle	3.01
Rabbits	2.54

Note: Higher means indicate a higher level of familiarity

Table 8 describes the participants' familiarity with the care of livestock show animals. The mean was somewhat similar to the familiarity of feeding of livestock with rabbits being the lowest with 2.73 familiarity rating and swine the highest with a 4.39 rating.

Table 8. *Familiarity with care of SAE livestock projects*

Animal	M
Swine	4.39
Beef Cattle	4.29
Sheep	3.84
Poultry	3.53
Goats	3.30
Dairy Cattle	3.28
Rabbits	2.73

Note: Higher means indicate a higher level of familiarity

Question six dealt with determining other problems with livestock show programs. To determine what other problems beginning agriscience teachers face, participants were asked a series of yes/no questions in which the participants responded by circling either “Yes” or “No.” Table 9 shows the questions and results of the participants’ responses.

Table 9. *Problems with livestock shows*

Question	% Yes	% No
Have you had trouble getting animals validated?	8.9	91.1
Have you had problems filling out entry cards?	9.0	91.0
Were there any problems once you arrived?	28.2	71.8
Were there any problems arranging travel?	37.2	62.8
If a student was ineligible, could you substitute another showman?	67.1	31.6
Did you remember all necessary supplies?	76.9	23.1
Did you order the proper number of gate/car passes?	82.1	17.9
Were show officials helpful?	85.9	14.1
Were there problems getting all students and livestock to different locations?	34.6	65.4

The respondents were asked in an open-ended question format whether they had experienced problems with parents at any time during the stock show season. Over half (55.7%) answered “No” and 44.3% answered “Yes.”

Those responding “Yes” and indicating that they had had a problem with parents were grouped into six different categories. Table 10 shows that the biggest problem agriscience teachers had with parents were the parents who thought they knew everything and the new teacher knew nothing, therefore not following the teacher’s advice. Closely following this was the problem of how parents conducted themselves at stock shows. The comments ranged from drinking with or around students to not being happy with the barn in which they were stalled. Next was the problem of the parents not thinking the teacher spends enough time with their child, parents doing all the work for the student, and parents undermining teacher authority.

Table 10. *Problems with parents*

Problem	Frequency
Parents think they know it all	10
Poor parent conduct at stock shows	8
Teacher does not spend enough time with their child	7
Parents do all the work for the student	6
Parent undermining teacher authority	5
Other problems	9
TOTAL	45[a]

[a]N=79, 34 did not respond

Respondents were asked to include any other problems they may have experienced during the show season which were not covered on the survey. After reading all the responses they were grouped into four different categories. Table 11 shows the participants who responded to this question had a number of comments that dealt with many problems, some of the most frequent being: validation and show rules, followed by problems with administrators and other teachers in the schools, and care and feeding of animals.

Table 11. *Additional problems*

Problem	Frequency
Validation and show rules	7
Care and feeding of animals	5
Problems with administration and other teachers	3
Other	7
TOTAL	22[a]

[a]N=79, 57 did not respond

Conclusions

The following conclusions are based on interpretations of data presented in the study and are restricted to only the population surveyed. They are also limited to the limitations found in chapter one of the study. The conclusions are as follows:

1. The average beginning agriscience teacher in Texas had been teaching for 2.53 years and 2.52 of these years were in the schools where they were currently working.

2. The average beginning agriscience teacher was 29 years old. This may be due to the fact that while these teachers are considered beginning teachers in Texas, they may have come from another state where they had previously been teaching.

3. The respondents reported the average agriscience program with beginning teachers in Texas had an enrollment of 123.4 students.

4. Beginning agriscience teachers believed that they were the least knowledgeable about poultry and rabbits and the most knowledgeable about goats and beef cattle.

5. The agriscience teachers had the least amount of years of participation with rabbits and poultry and the most years of participation with goats and beef cattle. However, they reported having the least years/semesters of high school and university exposure to goats and the most to swine and beef cattle.

6. Beginning agriscience teachers in Texas found it difficult to select and purchase quality show rabbits, but much less difficult to select and purchase quality beef cattle and swine.

7. When caring for and feeding livestock, beginning agriscience teachers were least familiar with the care and feeding of rabbits and most familiar with beef cattle and swine.

8. The most frequent stock show problems faced by beginning agriscience teachers were parents, making travel arrangements and getting students and livestock to different locations.

9. Almost half of the beginning agriscience teachers indicated having problems with parents during the stock show season.

Recommendations

The following recommendations are made by the researcher as a result of having conducted this study.

1. In future research concerning beginning agricultural science teachers, it should be made sure that the beginning agriscience teachers in the study are teachers who are just beginning their career and have no previous teaching experience.

2. Teacher educator programs in agricultural education should implement more training in the area of livestock care and evaluation to better prepare their teachers for the selection and purchasing aspect of stock shows as well as for the care and feeding of show animals leading up to the actual show.

3. More in-service workshops focused on small animals should be offered to beginning agriscience teachers.

4. University educators should make students in their agricultural education programs more aware of good public relations techniques to use, especially when dealing with parents.

5. Teacher educator programs in agricultural education should cover ownership requirements for animals shown in major stock shows.

6. In-service workshops which cover time and people management skills upon arrival at stock shows should be offered.

7. Teacher education curriculum for agriscience teachers should contain classes which include information about the SAEs.

8. Teacher educator programs in Texas should work with the Texas Agricultural Extension Service to develop pamphlets to deal with problems that can occur at livestock shows.

9. Studies similar to this should be conducted in other areas of the agriscience teachers' responsibilities, i.e., CDEs, LDEs, record books, etc. in order to verify the findings of this study.

10. Studies similar to this should be conducted in other states in order to verify the findings of this study.

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Using Visuals Effectively in the Distance Education Classroom

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Abstract

The purpose of this study was to evaluate the effectiveness of visuals and their components presented through a television monitor in the distance education classroom. As a means of accomplishing the purpose of the study, answers to the following questions were sought: (a) What are the demographic variables of the participants in the study? (b) What are the most appropriate color combinations for effective presentations for graphics utilizing distance education equipment? (c) What are the most appropriate types of fonts for effective presentations for graphics utilizing distance education equipment? (d) What are the most appropriate font sizes for effective presentations for graphics utilizing distance education equipment? (e) What are the most appropriate styles of emphasis for effective presentations for graphics utilizing distance education equipment? (f) Are there differences in preferences of color combinations, fonts and font sizes according to selected demographic variables?

The design for this study was survey research. Participants were asked to rate different color combinations, font types, font sizes and styles of emphasis according to their personal preference.

This study found that contrasting color combinations are essential to presentation formatting. The most preferred color combination was violet background/white text. The color preferred most for text was white. Sans-serif fonts are more desirable than serif fonts. The most preferred font size was 54. Distance or visual impairments had no significant relationship with color combination preferences, preferences for font style or styles of emphasis.

Introduction/Theoretical Framework

Americans have come to rely on technology for entertainment, communications, and to accomplish other daily tasks (Coldeway, 1988). Technology in telecommunications has been embedded into the routines of our lives at home and work over the last several years. Most recently, the use and application of telecommunication technology has found its way to our educational system (Valore & Diehl, 1987). Traditional education has become infused with technology and therefore, methods of education have greatly changed. Common words such as pencil, blackboard, and textbook are being replaced with words such as satellite uplink and downlink, laser disk, electronic library, Internet, telecourses and interactive video (Slama, 1995). This relatively new phenomenon, referred to as distance education, has greatly increased the possibilities for providing and accessing instruction (Wolcott, 1995).

Distance education takes place when the instructor and student are separated and the instructional gap is bridged by technology (i.e., voice, video, satellite, and print) (Willis, 1993). The gap that separates the instructor and the students at the remote site poses special challenges and responsibilities to the instructor. The instructor must develop an understanding for: (1) the needs of distant learners with limited or no face-to-face contact; (2) the delivery system technology; (3) how to function as a facilitator; and (4) course content material (Gottschalk, 1996).

The aim of distance education is to deliver instruction in places and times convenient to the learners instead of the instructor or the teaching institution (Moore & Kearsley, 1996). Through offering distance education courses, colleges and universities are given the opportunity to extend the institution's educational offerings, add consistency to curriculums by allowing students from many campuses to take courses from the best teachers, and reduce time and expenses in student and instructor transportation (LeBaron & Bragg, 1994). With all the opportunities to be gained, Wolcott (1995) claimed that, "it is increasingly likely that a college professor will be responsible for teaching in a distance education program" (p. 39).

Bischoff et. al (1996) stated the delivery method used for distance education is increasingly the use of interactive television technology. The technology used in distance education serves to enhance courses and their educational value (The Center for Distance Learning Research-Texas A&M, 1996). The Center for Distance Learning Research at Texas A&M (1996) suggested instructors should understand the capabilities and limitations of the technology. The center also commented that instructors' abilities to teach may be more valued through distance education classes since a broader audience is reached from a variety of places. Therefore it is important that graphics be modified or redesigned for maximum effectiveness over television monitors. Cyrs and Conway (1997) stated that existing lecture-based courses which are taught over television without the teaching methods being modified or adjusted result in a "talking head" telecourse.

There has been limited research devoted to determine what makes effective visuals in the distance education classroom. The increase in technology changes the problem from being able to find a way to deliver necessary materials, to finding good quality materials to deliver (Moore & Kearsley, 1996). If educators can communicate concepts in a variety of delivery methods, instead of predominately text, chances will increase that a greater number of students will be able to comprehend and retain information (Sethi, 1998).

Statement of the Problem

Despite widespread agreement about the need to incorporate visuals into the distance education classroom, there is controversy concerning the most effective color combinations, font type and size, and styles for emphasis. Experts have suggested the best color combinations, fonts, type size and styles to use for effective visuals in the classroom. However, the suggestions have contradictory information.

The literature also emphasized the importance of using effective visual components to enhance learning in distance education. The problem of this study was dissenting guidance in the designing of visual components to enhance the dissemination of information in the distance education classroom. The purpose of this study was to evaluate the effectiveness of visuals and their components presented through a television monitor in the distance education classroom.

Questions To Be Answered

In order to accomplish the purpose of this study, the following questions were formulated:

1. What are the demographic variables of the participants in the study in regard to the following variables: (a) distance seated from the television monitors; (b) gender; (c) size of hometown; (d) level of computer literacy; (e) access and utilization of the Internet and/or World Wide Web; (f) amount of television watched daily; and (g) visual impairments?

2. What are the most appropriate color combinations for effective presentations for graphics utilizing distance education equipment?

3. What are the most appropriate types of fonts for effective presentations for graphics utilizing distance education equipment?

4. What are the most appropriate font sizes for effective presentations for graphics utilizing distance education equipment?

5. What are the most appropriate styles of emphasis for effective presentations for graphics utilizing distance education equipment?

6. Are there differences in preferences of color combinations, fonts and font sizes according to selected demographic variables?

Significance

There is an ever-increasing likeliness that more colleges and universities will be adopting distance education programs and more college professors and students will be directly involved in distance learning. Therefore, it is important to research the effectiveness of visuals in these courses, since there has been little research done to identify the needs of visuals to enhance presentations.

Limitations

There were limitations of this study, which should be considered in the interpretation of the findings. First, the sample of this study was limited to the population of graduate and undergraduate students at a selected university, cooperating high school agricultural science teachers and participants of orientation activities who were present at the selected university during the 1998 summer sessions. Second, the study was further limited to those graduate and undergraduate students at the selected university, cooperating agriscience teachers and participants of orientation activities who voluntarily participated in the focus group activity.

Another limitation of the study was the variance in color adjustment levels and size of the television monitors. This must be taken into account when interpreting the data on color combinations. The monitors used in the study were 32" Sony televisions. Also, the statements used on the slides were kept short and this could be a limitation in making determinations of the best font sizes to use.

Methodology

Design

The design for this study was survey research, which was used to determine preferences of participants. Demographic information was collected from each participant concerning the distance seated from the television monitors, gender, size of hometown, level of computer literacy, access and utilization of the Internet and/or World Wide Web, amount of television watched daily, and visual impairments. In addition to the demographic information, participants were asked to rate different color combinations, font types, font sizes and styles of emphasis according to their personal preference.

Procedure

The distance from the television monitors to each chair was measured and recorded. The distance was measured from an estimated eye level, for each person seated in each chair, to the middle of the screen on the monitors. The chairs were labeled with numbers so each participant could be tracked for distance from the monitors. The participants were asked to put their chair number on the demographic information of the survey.

A series of two-color color combinations were shown to the participants, and they were asked to place a value from one to ten (one = no appeal, ten = high appeal) for each combination. The color combinations were chosen from previous research conducted by Pettersson (1989). The researcher’s study listed colors in rank order of preference for both the background and text, and combinations were derived from those results. The colors used were the default colors on the Microsoft Power Point program. Participants were also asked to choose which font types (serif or sans serif) were most readable to them. Types of font selected came from research by Johnson (1996), The Center for Distance Learning Research (1996), and Bankerd (1997). In this study, seven slides were presented with two statements in different font types. Participants chose which font type was most readable. They were also asked to place values on font sizes. There is some conflicting previous research on the size of font that is acceptable. Gibson and Mata (1992) stated point size should be no smaller than 26, while Bankerd (1997) suggested size could go as low as 24 point. For the purpose of this study, font sizes went as low as 18 point and as high as 66 point. Participants also chose the type style, which was most effective for showing emphasis. The styles of emphasis used were italics, underline, shadow, bold, and combinations of these styles.

Population

The population consisted of volunteers and included high school agricultural science teachers, current students of the selected university (both undergraduate and graduate), incoming freshman students and their parents. This sample of participants was used to enhance the range of the demographic variables, since the distance education classroom will be used by traditional and non-traditional audiences. The sample consisted of one hundred participants.

Instrumentation

The instrument used to measure the viewers’ appeal to color combinations and type styles was a researcher-designed survey consisting of five sections. Participants were asked to watch a series of Power Point slides and answer questions regarding the slides.

The first section of the questionnaire was used to obtain information regarding demographics. The second part of the questionnaire was fifteen sets consisting of four two-color combinations. Participants were asked to assign values to each combination, using a Likert-type rating scale from one to ten according to the level of appeal, (one = no appeal, ten = most appealing). There were a total of 60 color combination slides to be evaluated, however there were only 34 different color combinations. Combinations were repeated as a means of enhancing reliability. The third section of the questionnaire was designed to determine the viewers’ preferences between serif and sans serif fonts. Participants were shown seven slides, each having the same statement in two font types. Participants were asked to select the most appealing type of print.

The fourth section measured the size of print on a Likert-type scale, (1 = not readable, 10 = very easy to read). The section consisted of twelve questions. The size of the print ranged from 18 point to 66 point. The fifth section was designed to determine preferences of type styles for emphasis on important phrases or key words. Participants simply placed an “X” in the appropriate space for the emphasis style they preferred. There were four sets of three styles.

Setting

The classroom used for the survey was the distance education classroom at a selected college of agricultural sciences. The classroom seats 39 students. The individual seats were numbered to measure the distance from the center of the two 32” Sony television monitors at the front of the classroom. The lighting in the room remained at the same setting for every group so lighting would be consistent. The dimmable fluorescent overhead lights were at one hundred percent intensity. The overhead track lights were turned off, and the wall sconces were turned 20 percent intensity. There are no outside windows in the classroom to affect the lighting.

Collection of Data

Data collection began June 15, 1998, using the researcher-designed questionnaire. To increase participation in the study, willing participants received pencils as suggested by Dillman’s Total Design Method (1978). Participants were given a survey with a cover which thanked them for participating, briefly described the intentions of the study, and asked them to answer spontaneously, keeping their answers to themselves. Data collection was completed on August 12, 1998.

Data Analysis

Survey instrument responses were coded and entered into a computer file for analysis. Statistical analyses of the data files were completed using SPSS. Descriptive statistics were used to summarize the data pertaining to demographic variables and preferences to color combinations, font style and size, and styles of emphasis.

In order to determine if there was a relationship between the participants’ demographic variables and their preferences to color combinations, font types and sizes, and styles of emphasis, an analysis of variance test was performed using the .01 level of significance for variables to enter the equation. Although the a priori level of significance for the study was .05, it was reduced to .01 in order to control for the experimental-wise Type I error which might occur as the result of conducting repeated tests of significance. Post hoc analysis was conducted using the Duncan multiple range test. Pearson’s product moment coefficients and their resulting probability levels were calculated to determine if significant differences occurred between the variables of age and distance from the monitors and preference for color, font type, font size, and style of emphasis. As a means of measuring reliability, color combinations were repeated in sets. Pearson's product moment coefficients and their resulting probability levels were calculated to determine if significant differences occurred between repeating sets of color combinations. Significant correlations were found between the duplicated sets except for one color combination violet background/white text).

Results/Conclusions

The following results and conclusions are based on data collected through the focus group sessions.

Characteristics of Participants

The majority of participants were seated 20' or closer to the monitors at the front of the room. The most common seating range was 18'1" to 20' where 17% of participants chose to sit, 40% of the participants chose to sit 20'1" to 30' away from the monitors, 33% sat from the less than 10' range to 18' from the monitors and 10% of participants sat over 30' from the monitors.

The majority of participants (67%) were male. The age of the participants ranged from under 20 years to 50 and over. The majority (33%) were ages 20-24. The next largest age group was 45-49. Most of the participants (47%) came from a small town with a population of 500 to 4,999 people.

The majority of participants (48.4%) perceived themselves as somewhat computer literate and 84.7% reported having access to the Internet or World Wide Web. Thirty-two percent of participants utilized the Internet or World Wide Web weekly. Participants were also asked to indicate the amount of television they watched daily. The majority of participants (64.3%) watched one to two hours daily.

Fifty-seven percent of the participants possessed a visual impairment of some kind. The most common type of impairment among those participants was near-sightedness (39%), followed by far-sightedness (10%). Forty-three percent of the participants did not possess a visual impairment of any kind.

Preference of Color Combinations

Only those color combinations with ratings of 5.0 and higher were deemed acceptable. The color preferred most for text was white and yellow was the second highest preference. White text was in the top four-color combination selections preferred. The top four preferred color combinations, with ratings of 7.0 and up, were violet background/white text, green background/white text, black background/white text, and black background/yellow text. Those combinations with ratings of 6.0 to 7.0 were white background/black text, yellow background/blue text, white background/blue text, yellow background/black text, green background/yellow text, yellow background/red text, white background/green text, blue background/yellow text, black background/green text, and blue background/white text. The color combinations rated below 6.0 but still accepted at above 5.0 were white background/red text, and orange background/black text. The color combination with the lowest rating was yellow background/white text with a rating of 1.0.

Preferences of Font Sizes

There was a negative correlation between the rating of the font size with distance seated from the monitor. In most instances, except the extremes (18 point font size and 66 point font size), the participants further from the screens rated the font sizes lower. The most preferred size of font was 54. Font sizes larger than 54 began to decrease in scores as font size increased. Only those sizes with scores of 5.0 or higher were deemed acceptable. Font size 36 was the lowest scoring size still over 5.0, with a score of 6.43.

In every instance except one, sans-serif fonts were preferred over serif fonts. The fonts compared were: (1) Helvetica (97%)/Times (3%); (2) Palatino (13%)/Arial (87%); (3) Chicago (36%)/Bookman (64%); (4) New York (46%)/Arial (54%); (5) Helvetica (71%)/Century Schoolbook (29%); (6) Times (8%)/Gills Sans Condensed Bold (92%); and (7) Avante Garde (68%)/Book Antiqua (32%). The only time a serif font was preferred over a sans-serif font was in the third group where Bookman was preferred over Chicago. This finding concurs with previous research sited (Johnson, 1996; Bankerd, 1997; and the Center for Distance Learning Research, 1996) that sans-serif fonts are easier to read and generally preferred over serif fonts.

Styles of Emphasis

A combination of styles allows for better emphasis on important phrases and key words. The majority of participants chose a combination of two styles for emphasis in every instance where they were asked to choose between two styles of emphasis and a combination of the two.

Differences in preferences of color combinations, fonts, font sizes, and styles of emphasis according to selected demographic variables

Distance had no significant relationship with color combination preferences, preferences for font style or styles of emphasis. There was a significant relationship between the distance seated from the monitors and the size of font preferred. As distance increased, the preference to font sizes decreased. There was also a significant relationship between color combinations and age. There was a negative correlation between three of the color combinations and age (as age increased, preference for these color combinations decreased). The combinations were repeated in the survey to ensure reliability and the negative correlations appeared each time. No other demographic variables were significant in other preferences. When testing for reliability between the repeated color combinations, significant correlations were found between the duplicated sets except for one color combination (violet background/white text).

Recommendations

As a result of the findings of this study, the following recommendations are made:

1. Specific color combinations recommended are the top four preferred in the study: Violet background/white text; green background/white text; black background/white text; and black background/yellow text. Dark colors are recommended for background use with contrasting light colors for text. White or yellow are recommended for text.

2. Sans-serif fonts are recommended for text over serif fonts.

3. The recommended font sizes to be used are 40-48. Font size should not exceed 54 or be less than 36.

4. When emphasizing words or key phrases in the text, it is recommended that a combination of two styles of emphasis be used.

The following is a list of recommendations for future studies related to this study:

1. Further research should be conducted with color combinations being transmitted through the interactive compressed video system to determine if preferences remain the same after being delivered to a remote site.

2. Research should be conducted to determine the amount of text acceptable for monitors.

3. Because overheads are also utilized in the distance education classroom, a similar study should be conducted for determining what is most effective when overheads are presented using a document camera. A study should also be conducted to find if there is a difference in the effectiveness of overheads as compared to graphics seen on the television monitors.

4. The level of lighting in the classroom is an issue since darkness makes the slides and overheads easier to read and see, but makes note-taking more difficult. A future study should be done to determine the best level of lighting to utilize in the classroom.

5. The test should be repeated for the violet background/white text color combination since it was rated first in preference and was the only combination that did not show a significant correlation between the duplicate set.

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Attrition Rate in a Swine Continuing Education Course Delivered Asynchronously

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Introduction

Rapid advances in technology and distance education have provided a way for educators to reach more learners, regardless of time or place. Examples of these technologies include satellite, videoconferencing, and web-based learning environments.

World Wide Web Course Tools, or WebCT, is one of the newest innovations used in the web-based learning environment. "As of September 1999, WebCT has more than 3.6 million student users in 97,000 courses at over 800 colleges and universities in more than 40 countries" (WebCT, 1999, company). Students who use WebCT have the ability to access course content, take quizzes, submit homework and interact with instructors. "By offering a rich suite of course tools, WebCT enables instructors to quickly and easily create and customize their courses" (WebCT, 1999, company).

National Pork Producer's Council (NPPC) offered a continuing education, self-study farrowing management course available on the Internet as a WebCT course through NPPC's website (NPPC, 1999, producermain.html). This thirteen-week course was part of the Distance Learning Project, a program that was implemented by NPPC in 1998. The farrowing management course consisted of 10 lessons and incorporated a self-graded quiz with each lesson. The learner was allowed three attempts at the quiz. The lessons were self-paced and designed to be completed in about one hour. Participants who registered for the WebCT course were assigned a user name and password that gave them access to the farrowing management course. After all 10 quizzes were completed, the learner was then asked to fill out an on-line evaluation form. The learner was awarded a certificate at the end of the course.

NPPC first offered this course in the spring of 1999. Of the 84 participants enrolled, 23 completed the 10 lessons in the course. When the course was offered again the following fall, 133 people enrolled in the course, and 77 completed all 10 lessons. Even though distance education offers many opportunities to learners outside university walls, the completion rate of courses offered via distance education is lower than the completion rate in those courses offered through traditional modes.

Theoretical Framework

In order to develop a full understanding of the high attrition rate within distance education programs, it is important to first understand the characteristics of the adult learners and their reasons for participating in these programs. It is also necessary to incorporate instructional design, technological exposure, and barriers to course completion in relation to attrition rate.

Knowles, Holton, and Swanson (1998) define the characteristics of adult learners and their reasons for learning:

1. *The need to know.* Adults need to know why they need to learn something before undertaking to learn it. Adults should be made aware of how a learning situation can be applied toward real world experiences that in turn makes learning more meaningful.
2. *The learner's self-concept.* Adults have a self-concept of being responsible for their own decisions, for their own lives. Once they have arrived at that self-concept they develop a deep psychological need to be seen by others and treated by others as being capable of self-direction. They resent and resist situations in which they feel others are imposing their wills on them.
3. *The role of the learner's experience*. Adults come into an educational activity with both a greater volume and a different quality of experience from youths. These experiences lead to a diverse audience in any adult group setting. Background, learning styles, motivation, needs, interests, and goals vary to a large degree, and while the same is true of a group of youths, the big difference here is the emphasis on the individualization of teaching and learning techniques in adult education. Greater experience can also have some negative effects as well. Throughout a lifetime a person tends to develop mental habits, biases, and presumptions that tend to inhibit that individual from alternative ways of thinking and developing new ideas and different perceptions.
4. *Readiness to learn*. Adults become ready to learn those things they need to know and be able to do in order to cope effectively with their real-life situations.
5. *Orientation to learning.* Adult learners are life-centered in their orientation to learning. Adults are motivated to devote energy to learn something to the extent that they perceive that it will help them perform tasks or deal with problems that they confront in their life situations. Furthermore, they learn new knowledge, understandings, skills, values, and attitudes most effectively when they are presented in the context of application to real-life situations.
6. *Motivation.* While adults are responsive to some external motivators (better jobs, promotions, higher salaries), the most potent motivators are internal pressures (the desire for increased job satisfaction, self-esteem, quality of life). Motivation may be blocked by an adult's negative self-concept as a student, time constraints, and programs that violate principles of adult learning (pp. 55-61).

A primary concern of adult programs delivered at a distance is the high attrition rate. Many studies have been conducted in order to explain this phenomenon. Garrison (1987) believes that the reason for these studies is due to the need to show that "distance education is an effective and viable method of structuring and delivering education" (p. 95). A more important reason for these studies is the need to understand the characteristics of the distance learner in order to better design and deliver distance educational programs. Results from these studies "will not only ensure a better quality of program for current students but should also suggest means of improving access to educational programs and learning" (p. 95).

It is also important to recognize that attrition cannot and should not be attributed to one factor and that reasons for withdrawal are complex and interrelated (Bernard & Amundsen, 1989; Garrison, 1987; Kember, 1989; Morgan & Tam, 1999; Morgan & Littlewood, 1998; Powell, Conway, & Ross, 1990; Woodley & Parlett, 1983; Woodley, 1987). Barriers to learning and participation can be classified under three headings: situational, institutional, and dispositional (Cross, 1981). Other studies that have been conducted identify the same barriers but add an epistemological variable that creates difficulties for the learner and has an impact on his/her ability to complete a course (Enckevort, Harry, Morin, Schutze, 1986; Garland 1993; Gibson & Graff, 1992; Morgan & Tam, 1999; Woodley & Parlett, 1983). *Situational* barriers include a poor learning environment, lack of time due to work or home responsibilities and geographic location. *Institutional* barriers include cost, problems with institutional procedures, course scheduling, course availability and tutorial assistance. *Dispositional* barriers include lack of a clear goal, stress of multiple roles, time management, learning style differences, adult pride (interest, motivation and attitudes toward school and content), psychological, social, and economic factors. *Epistemological* barriers are concerned with the diversity of the different academic disciplines such as the research paradigms and communication techniques. All four factors have an impact on persistence in completing a distance education course.

When educating adults in distance learning environments using technological tools such as computers, it is important to address the question of "which methods of instruction and learning are particularly suited to adults' ways of learning" (Enckevort et al., 1986, p. 33). Galusha (1998) cited lack of technological training for the student as a barrier to learning in a distance education environment. Students who lack computer or writing skills may be inadvertently excluded from a course using an electronic medium as a delivery method. "If students are undertaking distance learning courses that require knowledge of the computer, then the students must be taught, at a minimum, the fundamentals of operating the system of choice of the distance-taught course. If distance learning is to be successful, technical barriers must be made a non-issue" (p. 11).

The issue of self-efficacy, "perceptions about one's capabilities to organize and implement actions necessary to attain a designated performance of skill for specific tasks" (Oliver & Shapiro, 1993, p. 81), is believed to be able to provide a "foundation for developing positive strategies for introducing computer-related skills" (p. 81). Oliver & Shapiro (1993) noted that few studies had been conducted concerning the concept of computers and self-efficacy, but among the studies most revealed that "those who possess a high degree of self-efficacy tend to be higher achievers than those who have a lower degree of self-efficacy" (p. 83).

The use of learner-centered strategies in web-based instruction is expected to lead to better instructional designs and improved andragogical practices (LeJeune, 1998). Intentional learning, self-direction, collaboration, and self-reflection that are commonly practiced in adult instruction may now be adapted to on-line courses. Dick and Carey's (1996) systematic instructional design model is one example of the steps one could follow in designing instruction. It consists of 10 steps: 1) determining the instructional goal; 2) analyzing the instructional goal; 3) analyzing learners and context; 4) writing performance objectives; 5) developing assessment instrument(s); 6) developing instructional strategies; 7) developing and selecting instruction; 8) designing and conducting formative evaluation of the instruction; 9) revising the instruction; and10) conducting a summative evaluation. This model was selected to determine if the course developers followed a systematic approach to designing the Farrowing Management Course on WebCT.

Purpose of Study and Research Questions

The purpose of this study was to evaluate how the interrelationships among learner characteristics, systematic instructional design, and technological comfort levels influenced the completion rate of a NPPC Farrowing Management course delivered via WebCT.

The following research questions were addressed in this study:

1. Were there differences in adult learner characteristics (situational and dispositional barriers) between completers and non-completers of the WebCT Farrowing Management Course?
2. Were there differences in perception of the appropriateness of course design (dispositional and epistemological barriers) between completers and non-completers of the WebCT Farrowing Management Course?
3. Were there differences in prior technological exposure and technological self-efficacy between completers and non-completers of the WebCT Farrowing Management Course?
4. What were the components of systematic instructional design that course designers implemented during the development of the WebCT Farrowing Management Course?
5. What were the suggestions made by course designers, completers, and non-completers for improvement of the WebCT Farrowing Management Course?

Research Procedures

The research for this study was conducted nationally in 15 states in the United States. The sampling technique used for this study was a qualitative method known as representative sampling. Representative sampling is "representative of a population to which it is desired to generalize" (Lincoln & Guba, 1985, p. 200). "Gatekeepers" were utilized in order to identify the course developers, completers, and non-completers of the course.

Qualitative research was the methodology. A semi-structured interview (with an interview protocol specific to completers, non-completers and course designers) and document analysis (an evaluative review of the WebCT course and an on-line evaluation collected by NPPC) served as the data-gathering sources. The researcher was the data-gathering instrument.

The interviews were conducted by telephone and were recorded and transcribed for future data analysis. The researcher continued to conduct interviews from both the completers and non-completer populations until the interviews failed to turn up any new data. Respondents were coded to ensure confidentiality with initials representing course developers (CD), completers (C), non-completers (NC), and non-completers who completed no lessons (NCN). A number followed to indicate the interview order. See Table 1 for the list of respondents.

The researcher used the constant comparative method to compare across categories and construct meaning (Lincoln & Guba, 1985). From this analysis, the researcher determined the relationships of how learner characteristics, technological comfort and instructional design influenced the completion rate of a web-based course.

Table 1. *List of Respondents*

Group	**N**	**Code**
Course Designers	5	CD1, CD2, CD3, CD4, CD5
Completers	15	C1, C2, C3, C4, C5, C6, C7 C8, C9, C10, C11, C12, C13 C14, C15
Non-Completers	11	NC1, NC2, NC3, NC4, NC5
Non-Completers- No Lessons		NC6, NC7, NC8, NCN1, NCN2 NCN 3

Findings

The complete findings were written as case studies in three sections: course designers, completers, and non-completers. A summary of findings follows:

Course Designers

The course was developed out of a need for the National Pork Producer's Council and the Agricultural Extension Service to work more closely in order to provide educational tools for anyone interested in expanding their knowledge about important issues in pork production such as farrowing management, breeding and gestation, nutrition, growing to finish, and nursery care.

Course designers wanted to create a course that would allow individuals to have access to information anytime and anywhere with the ability to work on it at their own pace provided they had a computer with access to the Internet. The purpose of the WebCT Farrowing Management Course was to provide producers with the information to perform their jobs better than before and to work more efficiently.

Although course designers did not specifically adopt an instructional design model, such as Dick and Carey's Systematic Instructional Design model, all of the steps in Dick and Carey's model were present to some degree.

1. Determining the Instructional Goal: Course designers used a variety of methods to determine the subject material to be used for the course. Initially, course designers met in Iowa to develop a list of learning objectives. A second method used by course designers in order to determine course content was a technique called visualization – seeing themselves as workers in a farrowing house.
2. Analyzing the Instructional Goal: The entry level skills required of the learner in order to succeed in this course were minimal; a desire to learn, a love for animals, the ability to read and write, and computer skills, although not mentioned in the course overview, were required of the learner prior to enrolling the course.
3. Analyzing the Learners and Context: On-line quizzes were created and implemented at the end of each lesson in order to analyze the learner and measure how much learning had taken place. The course designers were not able to incorporate any hands-on activities for the learners, but believed that the on-line quizzes were a way to provide the learner with something to do after they completed a lesson, and it provided the learners with feedback regarding their progress in the course.
4. Writing Performance Objectives: Performance objectives were identified to the learner at the beginning of each lesson, providing the learner with expected outcomes of each lesson.
5. Developing Assessment Instrument(s): Course designers developed on-line quizzes in order to assess the learners.
6. Developing Instructional Strategies: The course was converted to a web-based format by one individual, CD5, and a student worker by converting the print based material, videos, pictures and slides into digital formats and placing everything on-line in an easy to follow format.

7. Developing and Selecting Instruction: The instructional materials were derived from the course designers' determination of what was important for producers to know and learn about farrowing management in order to have a well functioning farrowing house. The expected outcomes of the course were two-fold: course designers wanted learners to understand the reason behind their actions and to enhance their job skills in order to continue to strive in the area of swine production. Course designers did not; however, develop and select instruction for the audience that actually enrolled in the course. This course was developed with the novice producer in mind and little consideration was given to the possibility of the more advanced producer enrolling in the course seeking more detailed information.
8. Designing and Conducting Formative Evaluation of the Instruction: Course designers used several methods to evaluate the course content. They used experts in the area of farrowing management to review the material for accuracy, conducted workshops and used the course content to teach them, and offered the course as a pilot study on-line to obtain feedback from the learners for suggestions for improvement.
9. Revising the Instruction: The instruction was revised from the feedback received from the formative evaluations from the workshops, pilot course, and swine experts.
10. Conducting a Summative Evaluation: The summative evaluations were collected at the end of the course and provided a way for course designers to continue to revise and improve the instruction.

Certificates were awarded to the learner upon completion of the course. Although the certificates did not have any educational credit attached, the course designers felt it was important to acknowledge those who had completed the course successfully.

Completers

The audience for the completers ranged from the novice pork producer (C14) to the expert. There were a few college instructors enrolled in the course (C4, C12), a pre-vet student who worked as a farrowing technician (C7), an instructional specialist (C5), several farrowing house managers (C1, C8, C13, C15), a feed salesman (C3), farrowing house employees (C6, C9), and several individuals who were self-employed and had been in the business for many years (C2, C10, C11).

The majority of the completers asked for more scientific or technical content and viewed the course as a refresher course; good for training new comers, but leaving the experts wanting more (C1, C2, C3, C4, C5, C7, C8, C9, C12, C13, C14, C15). Based on the interviews with the course designers, the course content was developed for the novice producer (CD1, CD3, CD4).

All of the completers ranked this course middle to high priority on their list and maintained a schedule in order to work on the course (C1, C2, C3, C4, C5, C6, C7, C8, C9, C10, C11, C12, C13, C14, C15). Even though several completers expressed that the content was not scientific or technical enough, they continued on with the course because they had enrolled in the course, paid for it, and were determined to finish what they started (C1, C2, C3, C4, C5, C14, C15). Five completers also expressed their concern with answers to a few of the quiz questions believing that it was probably a matter of opinion on technique (C8, C9, C12, C13, C14).

With the exception of two completers, this was the first time anyone had enrolled in a web-based course (C1, C3, C4, C5, C6, C7, C8, C9, C10, C11, C12, C13, C15); however, they were not intimidated by the technology used to deliver the material, and many enrolled because of the convenience the web-based learning environment afforded them (C1, C2, C3, C4, C5, C6, C7, C8, C9, C10, C11, C12, C13, C14, C15). Four of the learners; however, acknowledged the importance of hands-on training/learning (C5, C7, C10, C14). Technological difficulties were solved by the learners, either in their ability to fix the problem on their own, or by incorporating the help of a family member or someone associated with the farrowing management course (C1, C3, C6, C9, C11, C15). Completers described themselves as high (C2, C3) to average (C1, C4, C5, C7, C8, C10, C11, C12, C13, C14, C15) computer users.

Almost all completers had difficulty downloading the videos and there was a common complaint among all concerning the amount of time it took to download the videos as well as the poor quality of the videos (C1, C2, C3, C4, C5, C6, C7, C8, C9, C10, C12, C13, C14, C15).

The majority of the learners printed off the materials to study and logged back on to the course to complete the quizzes (C1, C2, C4, C5, C6, C8, C13, C14). Two people also expressed the desire to have a notebook with the course material, much like the notebooks used in the Nebraska Extension Home Study Kits prior to placing the course on-line (C3, C9).

Completers displayed a variety of adult learning characteristics found in the literature (Knowles, Holton, & Swanson, 1998). They had a purpose for enrolling in the course. For the majority of the learners, the purpose was to increase their knowledge about farrowing management (C3, C4, C6, C7, C9, C10, C11, C13, C14, C15). Others enrolled in the course in order to use the materials to train their employees on farrowing management techniques (C1, C8). They chose to learn via the Internet because they liked the advantages the web-based learning environment presented – the ability to work on a course at their own pace and on their own time in the convenience of their home or office. Completers also displayed a high degree of self-directedness, another characteristic of adult learners. Distance learning environments tend to be unstructured and require an individual to be in charge of their own learning. Completers developed and maintained a schedule to work on the course and ranked the course middle to high priority on their list of activities/responsibilities.

Completers had the background knowledge and prior experience to be successful in the Farrowing Management Course and the course content was relevant and meaningful to them. They also displayed a high degree of motivation to complete the course. Both issues demonstrated another characteristic of the adult learner.

Non-completers

The audience for the non-completers included a farrowing specialist for a feed company (NC1), a farrowing manager (NC3), experienced producers (NC4, NC5, NC6, NC8), a manager at a nutrition research center (NC7), and novice producers (NC2, NCN1, NCN2, NCN3).

Almost all of the non-completers worked on the course in their home (NC1, NC2, NC3, NC4, NC5, NC6, NC8). They ranked this course as a middle (NC3, NC8) to low (NC1, NC2, NC4, NC5, NC6, NC7) priority and did not keep a schedule to work on the course.

The majority of the non-completers enrolled in the course in order to increase their knowledge in farrowing management (NC1, NC2, NC3, NC5, NC8, NCN1, NCN2, NCN3) and to train others under their supervision (NC4, NC6, NC7). They also enrolled in the course because of the convenience of a web-based learning environment (NC2, NC3, NC6, NC8). They described themselves as average computer users (NC1, NC2, NC3, NC4, NC4, NC5, NC6, NCN2, NCN3) with the exception of one individual, (NCN1). Lack of computer skills did not hinder the completion of the course for all respondents except NCN1. However, almost all of the non-completers cited the lack of scientific or technical content as a reason for not completing the course, claiming that they would not benefit from the instruction; therefore, they chose not to finish the course (NC1, NC3, NC5, NC7, NC8).

Other reasons for not completing the course included too much time allotted to complete the course (NC2, NC4, NC6), failing to submit the quizzes (NC4, NC6, NC8), poor time management (NC2, NC4, NC5, NC6, NC7, NC8, NCN2, NCN3), attitude toward course content (NC1, NC3, NC5, NC7, NC8), and home/work responsibilities (NC2, NC5, NC7, NC8, NCN2, NCN3). A snapshot of the differences and similarities between completers and non-completers follows (Table 2).

Table 2. *Differences and Similarities Between Completers and Non-Completers*

	Completers	**Non-Completers Some Lessons**	**Non-Completers No Lessons**
Learner Characteristics	Persistent	Procrastinate	Procrastinate
• Study Process	Print-Outs	Print-Outs/Some Failed Submit Quiz	N/A
• Study Location	Work/Home	Home	N/A
• Course Rank	Middle-High	Middle-Low	Low
Instructional Design	Too Simple – Just Right	Too Simple	N/A
Technological Comfort/Exposure	High-Average	Average Failed to Submit Quiz	Low/Average

Conclusions, Implications and Recommendations

A summary of findings indicated that course designers used instructional design methodologies while creating this course, but targeted the novice producer as the primary audience. They did not take into consideration that advanced producers seeking more scientific or technical content would enroll. Non-completers did not foresee learning anything new from the course, and the lack of advanced course material resulted in many of the non-completers dropping from the course. Completers voiced similar complaints regarding the course content; however, they chose to remain in the course because they set this as a goal and were determined to finish. Two implications exist from these findings: 1) course designers need to create a course or several courses to reach different levels of producers, and 2) completers and non-completers demonstrate a difference in motivation and learning characteristics in regards to finishing the course. Therefore, the researcher recommends conducting a needs assessment in order to determine the level of material producers are seeking and creating lessons to correspond to those learners' specific needs. A second recommendation made by the researcher is to further study the role that persistence or motivation has in course completion. Completers demonstrated a high-degree of motivation in relation to the course, and wanted to finish regardless of their dissatisfaction, while non-completers were uninterested in receiving a certificate when they determined that the course content was not what they were seeking.

Other barriers to completion include too much time (making it easy to procrastinate) or too little time due to multiple responsibilities; both indicate poor time management on the learners' part. The implication exists that an individual still needs structure, even in a self-paced learning environment such as a web-based course. The researcher recommends incorporating weekly chat sessions in order to provide peer interaction and feedback from experts.

Technology was a barrier for only one individual enrolled, resulting in non-completion of the course, but for the rest of the learners, technology was a non-issue. The majority of the learners experienced difficulty downloading the videos and complained about the poor quality of the clips if they were able to view them. Therefore, many of the learners chose not to incorporate the video clips in their learning process. An implication exists that course designers need to improve the quality of the videos as well as decrease the problems associated with download time. The researcher believes that the videos could provide value to the course content and recommends re-digitizing the videos with the new and improved software available today or distributing the videos on CD-ROM.

There were several suggestions made by course designers, completers, and non-completers for improvement to the Farrowing Management Course. The implication exists that the individuals who were involved in the development of the course and enrolled in the course are interested in seeing the course evolve and improve for future enrollees. Based upon their suggestions, the researcher will provide recommendations for course improvement.

Recommendations for Course Improvement

The researcher developed recommendations for the National Pork Producer's Council to help lower the attrition rate for the WebCT Farrowing Management Course. Although these recommendations evolved from findings in this study, the researcher believes that many of these suggestions may be applied to a wider audience and may be considered as best practices when developing/designing and delivering/teaching material for a web-based course.

1. Conduct an on-line needs assessment that would determine the level of material that the learner is seeking and have corresponding lessons created to match the learner's needs.
2. Hyperlink to additional information. This would encourage self-directed learning and allow learners to seek more detailed information.
3. Have a database for the quiz questions that will randomly select the questions each time a learner takes a quiz in order to avoid taking the same one three times.
4. The slow download time and poor quality of the videos created several problems and almost all of the learners chose not to watch them. The researcher believes that the videos could serve as a valuable teaching tool and may offer some of the more detailed and scientific information that the learners are seeking. One solution to the on-line video dilemma would be to place the video clips on a CD-ROM and offer it to the learner for a few additional dollars for those who have the capability to run CD-ROMs on their computer. For those individuals who do not have that capability, the researcher suggests re-digitizing or re-streaming the video clips using the more advanced software available today and incorporating more still images with audio overlay in order to cut down on the choppy appearance of the videos.
5. Add to the Introduction/Welcome page a list of technological capabilities needed in order to utilize everything the course has to offer. Also include a list of qualities for success and expectations when enrolling in a distance education course.
6. In order to obtain more learner interaction and feedback within the web-based environment, have the course designers sponsor weekly chat sessions featuring a topic of the week. This would allow individuals to ask questions and view other participant's queries. A Frequently Asked Questions (FAQ) page could also be added to address questions when not in a chat session.
7. Administer an on-line pre-test for potential students in order to determine if this course is right for them. If they pass the quiz, they should already have a solid understanding of the content in the course and are looking for higher level content.
8. Create several lessons (i.e. more than 10) and allow learners to choose content that is relevant to them. Once the learner has completed 10 lessons, they are awarded a certificate of completion for their custom designed course.

Recommendations for Future Research

This study was exploratory in nature. Because teaching and learning on-line is a relatively new field of study, there was a need to determine learner characteristics and instructional design components that may or may not influence attrition rate. Based upon the results of this investigation, it is recommended that a follow-up study be conducted after implementation of the recommended changes in course design to determine if attrition rate changes.

Persistence or motivation and procrastination are learning characteristics that influence completion (Enckevort et al., 1986; Moore, 1986; Powell et al., 1990; Woodley, 1987). The researcher recommends that further research be conducted in this area utilizing a persistence or motivation instrument such as the Motivated Strategies for Learning Questionnaire (MSLQ) (Pintrich, Smith, Garcia, & McKeachie, 1991) in further understanding the role that motivation or persistence plays in course completion.

Final Reflections

The interrelationships among learner characteristics, instructional design, and technological comfort are quite complex. Just like the three legs of a stool provide support and balance, these three factors interplay to provide support to the learner in an asynchronous environment. For example, the course designers must consider prior technological exposure and comfort of the learner when developing a course. Depending on the learner's technological skill set, the course designers may need to provide an opportunity for practice, guided tutorials, or detailed instructions to ensure that technology is not a barrier to course completion. Additionally, course designers can create an atmosphere for peer interaction using communication tools such as chat rooms, threaded discussion, bulletin boards, etc., to simulate the types of discussions that are typical in face-to-face situations. These interrelationships deserve consideration for effective design and delivery of web-based courses.

Even though distance education is providing more convenience and access to continuing education, the learners are still accustomed to the "traditional" classroom environment. Although attrition rate is normally higher in asynchronous situations, it appears that it is more a result of our social norms rather than instructional design issues. With the exception of the simplicity of content, the only difference between completion and non-completion is within the control of the learner and their willingness to be self-directed. Maybe with time and more exposure to these on-line learning environments, learning characteristics will change. Just like the 1900s when America was shifting from an agrarian society to an industrial society with the invention of the automobile and gasoline, the next 100 years will shift from the industrial to the information age. This time the vehicle is the Internet.

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Computer Experiences, Self-Efficacy and Knowledge of Freshman and Senior Agriculture Students

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Abstract

Freshmen (n = 82) and senior (n = 75) agriculture students at a land-grant university were studied to compare their computer-related experiences, computer self-efficacy, and computer knowledge. Both freshmen and senior students reported a variety of computer experiences, with a majority in both groups owning a computer and having completed one or more computer courses. A higher percentage of seniors had studied each of eight computer topics than had freshmen. Seniors had a higher level of overall computer self-efficacy than freshmen. Seniors also scored higher (52.0% correct) on a 35-item computer knowledge exam than did freshmen (39.6% correct). Recommendations for enhancing the computer education of agriculture students were made as a result of this study.

Introduction

Computers play an important and ever increasing role in modern agriculture. In follow-up studies, university agriculture graduates consistently rate computer skills as being important to career success (Andelt, Barrett, & Bosshamer, 1997; Graham, 1997; Radhakrishna & Bruening, 1994). Yet, Heyboer and Suvedi (1999) found that recent (1993 - 1998) graduates of the College of Agriculture and Natural Resources at Michigan State University felt they had received less than satisfactory preparation in computer use, rating computers as the area in which they were least prepared for employment.

Agricultural employers also place significant importance on computer skills, with more than 80% indicating that computer skills are either an ‘important" or "very important" factor considered when making employment decisions (Monk, Davis, Peasley, Hillman, & Yarbrough, 1996). Thus, university agriculture programs must ensure that graduates are competent in computer use (Davis, 1997; Johnson, Von Bargen, & Schinstock, 1995).

In a Cornell University study, Monk et al. (1996) determined that agriculture graduates should be proficient in word processing, presentation graphics, spreadsheet analysis, database management, technical graphics, Internet use and electronic mail. Further, students should be sufficiently comfortable with computer and information technologies so they can develop new computer skills throughout their careers. Researchers at the University of Wisconsin-Stout also found that abilities in these same areas are important for students in a wide variety of majors (Furst-Bowe et al., 1995).

Recognizing the importance of computers in agriculture, Bekkum and Miller (1994) surveyed deans at 71 land-grant colleges of agriculture to determine the strategies used to ensure that graduates were proficient in computer use. Of the 59 deans responding, less that one-half (44.1%) reported a college-wide computer education requirement. Further, 11 (18.6%) of the deans believed that, in the future, less time would be required for basic computer skill development, since students would have developed these skills prior to entering college. According to Kieffer (1995), many university faculty and administrators accept the premise that students enter college already possessing basic computer skills.

Johnson, Ferguson, and Lester (1999) tested this premise by assessing the computer experiences, self-efficacy and knowledge of students ($\underline{N}$ = 175) enrolled in three freshman-level agriculture courses at a land-grant university during the fall 1998 semester. The researchers concluded that the students had not completed a common core of computer experiences, lacked confidence in their computer skills, and had a low level of computer knowledge (as indicated by a mean score of 38.8% correct on a 35-item multiple choice exam). Student academic classification explained only about 10% of the variance in either computer self-efficacy or exam scores. However, the researchers cautioned that the upper-division students enrolled in these introductory courses might not be representative of all upper-division agriculture students.

Johnson et al. (1999) noted a substantial positive correlation ($\underline{r}$ = .67) between computer self-efficacy and computer knowledge and hypothesized that, while students recognized their lack of computer skills, they were not motivated to improve because computer skills are not regularly required in undergraduate courses. Subsequent research (Johnson, Ferguson, Wyatt & Lester, 2000) found that undergraduate agriculture courses tended to require a limited amount of student computer use, with most required tasks being drawn from a fairly narrow subset of basic computer skills. Brown and Kester (1993) posited that students tended to forget many of the skills learned in introductory computer courses because they did not use these skills in subsequent courses.

Given the importance that both graduates and employers place on computer skills, and the suggestion that computer skills decay because of disuse in subsequent courses, a clear need existed to examine and compare the computer experiences, self-efficacy and knowledge of freshman and senior agriculture students. The results of this study would provide information necessary for enhancing the computer experiences and skills of undergraduate agriculture students.

Objectives

The purpose of this study was to describe and compare the computer experiences, self-efficacy and knowledge of freshmen and senior agriculture majors in a land-grant university. Specific objectives were to:

1. Compare demographic and computer-related experiences of freshmen and senior agriculture majors;

2. Compare the computer self-efficacy of freshmen and senior agriculture majors;

3. Compare the computer knowledge of freshmen and senior agriculture majors; and

4. Determine the relationship between selected demographic and computer-related experiences and computer self-efficacy and knowledge of freshmen and senior agriculture majors.

Methods

Data were collected by administering the Computer Experiences and Knowledge Inventory (CEKI) in five sections of a course enrolling primarily freshmen (AGED 1011 - Freshman Orientation) and in eight purposively selected upper-division agriculture courses during the fall 1999 semester. These courses had a total unduplicated enrollment of 253 students; however, only students classified as freshmen (N = 84) or seniors (N = 74) were analyzed and reported for this paper.

The CEKI consisted of three parts. Part One contained 24 items related to student demographics and computer-related experiences. Part Two consisted of eight Likert-type items requiring respondents to assess their own level of skill (1 = "no skill"; 5 = "high skill") in eight specific areas of computer use. Part Three was composed of 35 multiple choice items (with five response options, including a "Do not know" option) designed to measure student knowledge in the areas of general computer knowledge (six items), Internet use (five items), word processing (eight items), file management (five items), spreadsheets (six items), databases (three items), and BASIC computer programming (two items). All items in Part Three were written so as to be answerable by persons familiar with common operating systems and application programs.

The CEKI was evaluated by a panel of five experts with experience in teaching introductory computer applications to college agriculture students and was judged to possess face and content validity. For the present study, coefficient alpha reliability estimates were .78 (Part Two) and .82 (Part Three) for the freshmen students and .89 (Part Two) and .85 (Part Three) for the senior student group. The reliability of Part One was not assessed, since, according to Salant and Dillman (1994), responses to non-sensitive, demographic items are subject to little measurement error.

Results

The typical freshman student was an 18-year-old (Mdn) female (54.9%), who had graduated in a senior class of 130 (Mdn) students while maintaining an "A-minus" or higher grade average (63.8%). Poultry science (23.2%), horticulture and agricultural education (14.6% each), and pre-veterinary medicine (11.0%) were the most common majors for the freshmen students.

The typical senior was a 22-year-old (Mdn) male (74.3%), with a college grade point average of between 2.50 and 2.99 (41.3%). The most frequently reported majors were agribusiness (28.0%), poultry science (20.0%), and agricultural education and turf management (9.3% each).

Both freshmen and senior students reported a variety of computer experiences (Table 1). Over 70% of both freshmen and senior students reported owning a computer, with virtually all being PCs. Seniors (88.0%) were more likely to have completed a computer course than were freshmen (76.8%), although a majority in both groups had completed one or more computer courses. A majority of both freshmen (52.5%) and senior (62.7%) students had completed either one or two computer courses. Almost all (90.3%) of the freshmen completing computer courses had done so at the high school level, while a majority of senior students (95.4%) had either completed computer coursework only in college (39.4%) or in both high school and college (56.1%).

Table 1. *Computer-Related Experiences of Freshmen and Senior Agriculture Students.*

	Freshmen		Seniors	
Variable	n	%	n	%
Own a computer	82	71.6	75	77.3
Type of computer:	58		57	
PC		96.6		94.7
MacIntosh		3.4		3.5
Both		0.0		1.8
Number of computer courses completed:	82		75	
None		23.2		12.0
One		23.2		28.0
Two		29.3		34.7
Three		15.9		13.3
Four or more		8.5		12.0
Where computer course(s) was/were completed:	62		66	
High school only		90.3		4.6
College only		4.8		39.4
Both high school and college		4.8		56.1

A majority (53.8%) of freshmen reported they had never taken a course (other than a computer course) where computer use was required. Among seniors, a majority reported that the use of spreadsheets (61.6%), databases (83.6%), and presentation graphics (57.5%) were required "not at all" or "seldom" in their college courses.

The students were asked to indicate whether or not they had studied selected computer topics. Over one-half of the senior students had studied seven of the eight topics, with computer programming being the only topic not studied by a majority of the seniors. Word processing, file management and spreadsheets were the only three computer topics that 50% or more of the freshmen reported studying. Small to large discrepancies existed between the percentage of seniors and freshmen having studied each of the eight computer topics, with a higher percentage of seniors having studied each topic. Overall, freshmen reported studying 4.0 (Mdn) of the eight computer topics, while seniors reported studying 6.0 (Mdn) of the eight topics.

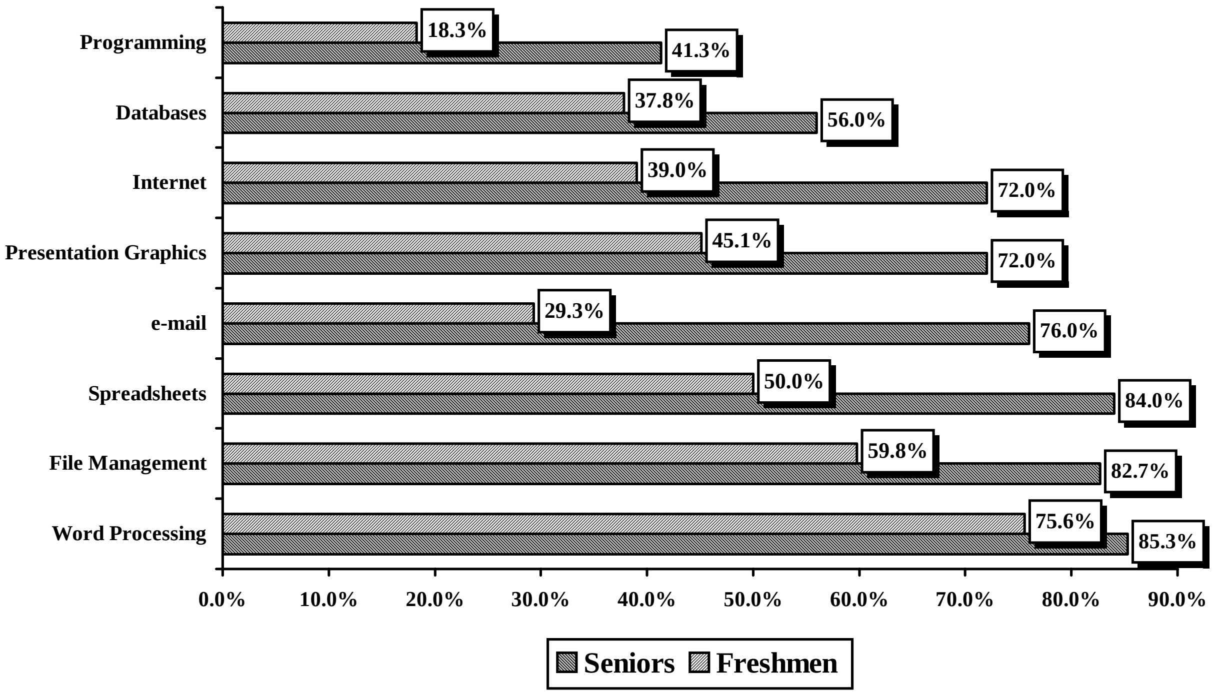


Figure 1. *Percentage of freshmen and senior students having studied selected computer topics*.

The students also rated their own level of skill in each of eight areas of computer use on a five-point Likert-type scale (1 = "no skill"; 5 = "high skill"). For ease in reporting, responses were collapsed into "below average skill," "average skill," and "above average skill" categories. Less than one-half of the freshmen rated their skills as above average for any of the eight areas of computer use. Conversely, a majority of seniors felt they possessed above average skills in word processing, Internet use, and electronic mail. A majority of freshmen rated their skills in computer programming, databases, presentation graphics, and spreadsheets as being below average. Computer programming and databases were the only areas where a majority of seniors rated their skills as below average. Table 2 summarizes student perceptions of their level of skill for each of the eight areas of computer use.

Responses to the eight individual items reported in Table 2 were summed and averaged (using the original 5-point scale) to arrive at an overall measure of computer self-efficacy (CSE) for the freshmen and senior student groups. For the freshmen, the mean CSE score was 2.78 (SD = .78); for the seniors, the mean CSE score was 3.19 (SD = .73).

Table 2. *Self-Perceived Computer Competency of Freshmen and Senior Agriculture Students.*

	Freshmen (n = 82)			**Seniors (n = 75)**		
Computer area	Below average %	Average %	Above average %	Below average %	Average %	Above average %
Word processing	8.5	42.7	48.8	4.0	36.0	60.0
File management	20.7	42.7	36.6	13.3	42.7	44.0
Internet use	17.1	50.0	32.9	10.7	33.3	56.0
Electronic mail	17.1	45.1	37.8	9.3	36.0	54.7
Spreadsheets	51.8	32.1	16.1	28.0	33.3	38.7
Presentation graphics	57.3	25.6	17.1	24.0	41.3	34.7
Databases	61.0	29.3	9.9	53.3	29.3	17.3
Computer programming	82.9	12.2	4.9	74.7	20.0	5.3

For freshmen, the mean score on the 35-item exam portion of the CEKI was 13.85 (SD = 5.12), or 39.6% correct. The mean score for seniors was 18.2 (SD = 6.22), or 52.0% correct. As shown in Figure 2, a higher percentage of freshmen scored in the lower score intervals, while a greater percentage of seniors scored in the higher score intervals.

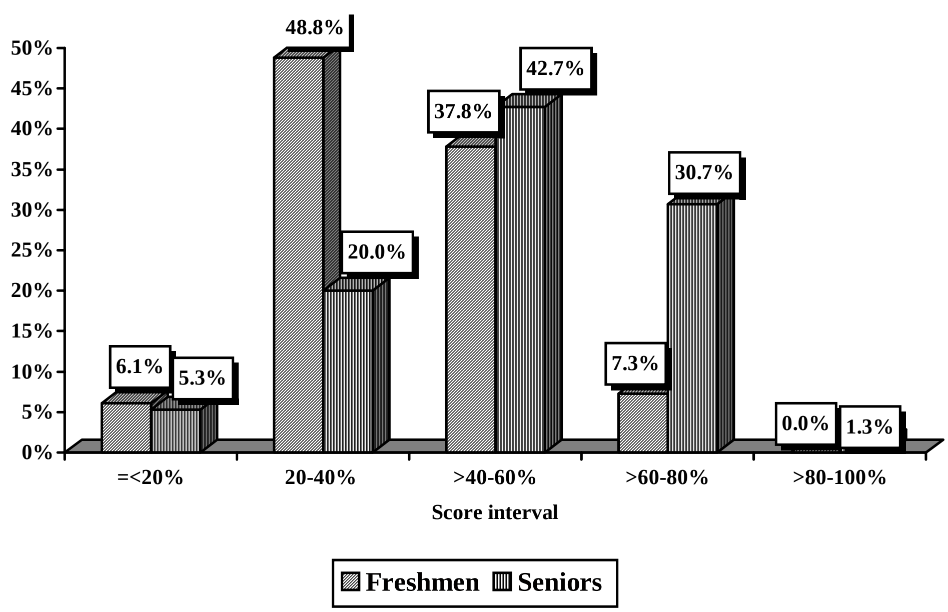
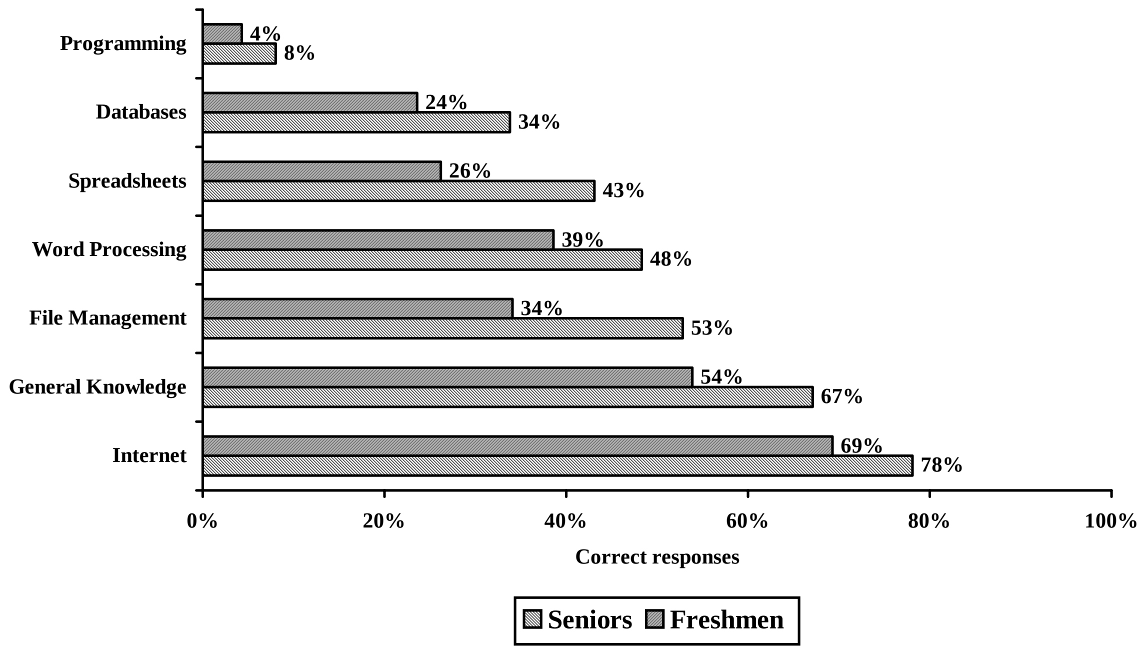


Figure 2. *Distribution of Grouped CEKI Exam Scores for Freshmen and Senior Students.*



Seniors scored a higher mean percentage of correct answers on each of the seven areas of the CEKI exam than did freshmen. Seniors averaged over 50% correct on the Internet use, general knowledge and file management exam sections. For freshmen, mean scores were above 50% correct for the Internet and general knowledge sections; scores were less than 40% for the remaining exam sections (Figure 3).

Figure 3. *Mean Scores on the CEKI Exam, by Section and Classification*

For freshmen, the relationship between demographic and computer experience variables and computer self-efficacy and CEKI exam scores ranged from negligible to substantial. Owning a computer had the highest correlation with computer self-efficacy ($\underline{r}$ = .46), while the number of computer topics studied had the highest correlation with CEKI exam scores ($\underline{r}$ = .30). A substantial positive relationship existed between computer self-efficacy and CEKI exam scores ($\underline{r}$ = .63).

For seniors, the relationship between demographic and computer experience variables and computer self-efficacy and CEKI exam scores ranged from negligible to moderate. The extent to which respondents felt that computer use had been required in their college courses was the best predictor of computer self-efficacy ($\underline{r}$ = .51). College grade average was the best predictor of scores on the CEKI exam ($\underline{r}$ = .42). Finally, a moderate positive relationship existed between computer self-efficacy and CEKI exam scores ($\underline{r}$ = .35). Table 2 summarizes these relationships for both freshmen and senior agriculture students.

Table 3. *Relationship Between Selected Demographic and Computer Experience Variables and Computer-Self Efficacy and CEKI Exam Score for Freshmen and Senior Agriculture Students.*

	Freshmen ($\underline{n}$ = 82)		**Seniors ($\underline{n}$ = 75)**	
Variable	CSE	CEKI exam score	CSE	CEKI exam score
Age	-.11	.08	-.24	.01
Gender[a]	-.08	-.10	-.13	-.23
High school senior class size	.05	.07	---	---
High school grade average	.36	.15	---	---
College grade average	---	---	.15	.42
Completed computer course(s)[b]	-.01	.15	.05	.14
Number of computer courses completed	.28	.25	.10	.17
Number of computer topics studied	.34	.30	.16	.10
Computer-use required in HS courses [b]	.29	.07	---	---
Extent of required college computer use	---	---	.51	.27
Own a computer [b]	.46	.24	.20	.22
Computer self-efficacy (CSE)	---	.63	---	.35

[a]Coded as female = 0 and male = 1. [b]Coded as no = 0 and yes = 1.

Conclusions

Both freshmen and senior agriculture students in this study had a variety of computer-related experiences. A majority in both groups had completed one or more computer courses and owned a computer. However, a significant minority of both freshmen (23.2%) and seniors (12.0%) reported having never completed a computer course.

Significant percentages of freshmen had not received instruction in important areas of computer use. Fewer than one-half of the freshmen had studied presentation graphics, Internet use, e-mail, databases, or programming. Additionally, significant percentages of freshmen had not studied spreadsheets, file management or word processing. It was concluded that freshmen

entering the College have not participated in a common core of formal educational experiences related to the most frequently used computer applications and operations.
While a higher percentage of seniors had studied each computer topic than had freshmen, significant percentages (ranging from 14.7% to 57.7%) of seniors also reported never having studied each topic. Thus, senior agriculture students may be graduating without the computer skills necessary for career success.

Freshmen had a slightly below average level of computer self-efficacy, while seniors had a slightly above average level of computer self-efficacy. While seniors tended to rate their skills higher, both groups were most confident of their abilities in word processing, file management, Internet use and electronic mail. A majority of freshmen reported below average skills in spreadsheets, presentation graphics, databases and programming. Over one-half of the seniors reported below average skills in databases and programming, while approximately one-fourth reported below average skills in spreadsheets and presentation graphics. A significant percentage of both freshmen and seniors lack confidence in their ability to use common computer applications.

Although seniors scored higher than freshmen on the CEKI exam, a majority of students in both groups scored 60% or less. The mean score for freshmen was 13.85 (39.6% correct); for seniors the mean score was 18.2 (52.0% correct). Apparently, freshmen enter the College with a low level of computer knowledge, while seniors exit with a higher, but still low, level of computer knowledge.

For freshmen, owning a computer was the best predictor of computer self-efficacy, while, for seniors, the extent to which college courses had required the use of computers was the best predictor. For seniors, college grade average was a fairly good predictor of CEKI exam scores, however, high school grade average was a relatively poor predictor of freshmen exam scores. Computer self-efficacy explained approximately 40% of the variance in freshmen CEKI exam scores; for seniors, computer self-efficacy explained only about 12% of the variance in these scores. It appears that freshmen were more realistic than seniors in assessing their own computer skills. With the exception of computer self-efficacy (freshmen only), no particularly powerful predictors of computer knowledge were identified. Johnson et al. (1999) also found computer self-efficacy to have a substantial positive relationship (r = .67) with CEKI exam scores for students enrolled in introductory university agriculture courses.

Recommendations

Efforts must be made within this College to enhance the computer knowledge of both entering and graduating students. In order to accomplish this objective, the following recommendations are made.

The elective College computer course (AGME 2903 - Computer Applications in Agricultural, Food & Life Sciences) should be examined and possibly revised to ensure that the content and assignments provide students with the experiences necessary to develop sufficient skills in commonly used computer applications. AGME 2903 should then be made a required course for students enrolled in the College. However, because some students already have a high level of computer knowledge, a performance testing option should be available whereby students can test out of this requirement.

Finally, systematic efforts should be made to more fully integrate required student computer use into undergraduate agriculture courses. While all instructors should be encouraged and assisted in integrating computer use into their courses, consideration should be given to developing and implementing a number of “computer-intensive” courses into the curriculum. Assignments in these courses should be designed to require a variety of higher-level computer skills that enhance the learning and application of academic subject matter. One or more of these computer-intensive courses should be required for graduation.

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Teacher Attitudes toward Professional Organization-Developed, State Board-Approved Standards for Agricultural Education

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Abstract

Accountability was the focus of this study of the attitudes of program personnel toward the teacher association-formulated and State Board-approved Standards for Agricultural Education in Georgia. Data were collected from state Agricultural Education personnel by securing their reactions to 32 statements about the Standards. Eighty-five percent of the personnel in Georgia participated. A Cronbach's alpha reliability coefficient of .95 was determined for the instrument. The sample demographics were representative of the population for the state. Most respondents reported using the Standards within their departments, but many used them as a shared evaluation instrument. Respondents agreed on 11 statements, were undecided on 20 items, and disagreed with one item. Attitudes toward the Standards were affected by job description, years of experience, use made of the standards, age, gender, size of school, and ethnicity of respondents. Educational level and number of teachers of agriculture in the school had little effect on ratings of the statements about Standards.

Introduction

Accountability has been a byword in education for many years. The educational reform movement was initiated by the National Commission on Excellence in Education in its 1983 report, A nation at risk... . Numerous state and national reports followed, including the National Research Council's 1988 report, Understanding agriculture... . In Georgia, a "Futures Conference" in Agricultural Education (Iverson, 1987) was held to address concerns about the program and its development. Later, the Georgia Quality Basic Education Act (QBE) was a legislative response to the public outcry for accountability. Within the profession, some state leaders had anticipated the need for reform. In the early 1970's, the Iowa Standards for Vocational Agriculture (Iowa Department of Education, 1977) were developed as a means for improving the program and to serve as means for assuring accountability. However, these standards were not widely accepted by programs across the country. In Georgia, no written standards were in existence until the Georgia Vocational Agriculture Teachers Association began drafting a trial instrument in 1994. Committees were utilized during the developmental phase to formulate a list of standards. In addition to the Iowa Standards, state planning materials from Missouri (1992), Arizona (1995), California (1995), Ohio (1995), Oklahoma (1995), Texas (1995), Michigan (1996), North Carolina (1996), South Dakota (1996), and West Virginia (1996) were referenced to develop a tentative list. A total of 33 standards for high school agriculture teachers, 11 standards for local system support, 6 for Food Processing Centers, and 29 for middle school agriculture teachers, were field tested for one year, and the list was modified and approved by majority vote at the 1996 GVATA Summer Conference (Georgia Vocational Agriculture Teachers Association, 1996). These Standards were approved by the Georgia Department of Education in January, 1996. The Georgia Board of Education reviewed and adopted the standards in 1998. Adjustments and expansion to specialized areas have occurred each year since the initial standards were developed. However, the general attitudes of agricultural education personnel in Georgia regarding the standards had not been measured, up until this study.

Purpose and Objectives

The primary purpose of the study was to determine perceptions of the Georgia Standards for Agricultural Education held by GVATA personnel. Specific objectives were to: 1) determine the characteristics of the respondents; 2) ascertain the use of the Standards instrument in respondents' programs; 3) determine respondents' attitudes toward evaluation statements regarding the Standards; and 4) find out if certain demographic characteristics influenced respondent attitudes toward the Standards.

Methods and Procedures

The design of the study was descriptive *ex-post facto*. The target population was all Agricultural Education personnel in Georgia. The sample consisted of Agricultural Educators in attendance at the 1998 GVATA Summer Conference. Since no data-gathering instrument specific to the objectives of this study was found in the literature, the researchers developed a two-part questionnaire which included a nine-item demographic section and a list of 32 evaluation statements. These statements were set up on a five-point, Likert-type scale, with “1” representing “strongly disagree”, “2” being “disagree”, “3” indicating “uncertain”, “4” being “agree” and “5” representing “strongly agree”. The instrument was field tested with the Regional Agricultural Education staff, UGA Agricultural Education faculty, and two English teachers and an administrator at Jeff Davis High School, Hazelhurst, GA. The instrument was also reviewed and approved by the Human Subjects Committee, Institutional Review Board, The University of Georgia. After modifications were made, the final instrument was duplicated for distribution at the Summer Conference.

Data collection was conducted at the opening general session of the 1998 GVATA Summer Conference. Additional data collection was done at regional breakout sessions, which assured that all in attendance at the Conference were given the chance to be represented in the study. Additional follow-up was done by mail to those identified as <u>not</u> attending the conference; the mailing list was provided by the three regional coordinators. Of the 226 registered at the Conference, 197 or 87.2% provided useable responses. The 73 individuals identified as not being at the Conference were surveyed by mail; 59 responses (80.8%) were received, for a total of 256, which represented 85.6% of state Agricultural Education personnel. The mailed follow-up responses were compared with responses from the Conference, using the t-test for independent samples on the evaluation items; only two items – numbers 25 and 30 – were significant at the .05 level, which was set *a priori*. Since this number of significant items could have occurred by chance alone, the respondents were assumed to be from the same population; therefore, all responses were combined for analysis.

Primarily descriptive statistics were used to analyze the data, including frequencies, percentages, means, and standard deviations. In addition, Cronbach’s alpha was used to determine the reliability of the instrument. The reliability coefficient for the 32 evaluation variables was .946. Subgroups from the demographic section were also used to analyze the responses to the 32 evaluation variables, using Chi Square and ANOVA statistics.

Findings

Characteristics of Respondents
Educational level: Respondents were nearly evenly split between those having a Masters degree and those having a Bachelors degree, each at about four in ten. However, when those having graduate degrees were combined, nearly two-thirds had advanced degrees; fewer than 2% had “other” degrees.

Years of experience: The respondents years of teaching experience ranged from 0 to 37, with a mean of 14.6 years. The three largest groups were those with 0 to 5 years (23.4%), 6 to 10 years (18.4%), and 16 to 20 years (17.6%); together these groupings comprised six out of ten respondents.

Age: The respondents ages ranged from 23 to 66, with an average age of 40 (mean of 39.97). The greatest number ranged in age from 40 to 49 (41%), followed by those ranging from 30 to 39 (31%); together, these age groups comprised seven out of ten respondents.

Gender: The respondents were predominantly male (84.8%).

Ethnic heritage: The predominant ethnic heritage was Caucasian (91%), followed by African-American with 8.2%. Hispanic and Asian made up less than 1%.

Size of school: The size of school which employed the largest number of respondents was AA (32%), followed by those employed at AAAA schools (23.8%), AAA schools (20.7%), and the smallest, “A” schools (17.6%).

Teacher status: The largest number of teachers taught in single teacher departments (141, or 55%); most of the remainder taught in multi-teacher departments with two or three teachers.

Job description: Over seven out of ten of the respondents were regular high school teachers (72.3%), followed by middle school teachers (12.1%), young farmer teachers (10.2%), and state Agricultural Education staff members (3.1%); other personnel made up only two percent. These findings may be observed in Table 1.

Uses of the Standards

The largest group of respondents said that the Georgia Agricultural Education Program Standards are only used by the department (40%), followed by those who use them as a shared evaluation instrument (32.9%), those using it as the only evaluation instrument (18,8%), those who do not use it at all (5.5%), and the “other” category, (2.7%). The responses given for the other category were 1. Assist with program standard evaluation, 2. Administrator use, 3. Used to prepare future teachers, 4. Used in classes—

T. Ed. Standards 5. Personal use, and 6. Regional office use. These data may be observed in Table 2.

Table 1. *Characteristics of Respondents (N=256)*

Characteristics/Category	**Frequency**	**Percentage**
Educational Level		
Provisional	2	.8%
BSA	95	37.1%
Masters	98	38.3%
EdS	51	19.9%
Doctorate	8	3.1%
Other	2	.8%
Years of Teaching Experience		
0 - 5 years	60	23.4
6 - 10 years	47	18.4
11-15 years	28	10.9
16 -20 years	45	17.6
21 - 25 years	35	13.7
26 - 30 years	29	11.3
31 - 37 years	12	4.7

Age of Respondents		
23 - 29 years old	37	14.45
30 - 39 years old	80	31.25
40 - 49 years old	104	40.63
50 - 66 years old	35	13.67
Gender		
Male	217	84.8
Female	38	14.8
Ethnic Heritage of Respondents		
Caucasian	233	91.0
African-American	21	8.2
Hispanic	1	0.4
Other	1	0.4
School Size		
A	45	17.6
AA	82	32.0
AAA	53	20.7
AAAA	61	23.8
Other	14	5.5
Teacher Numbers in Respondent Schools		
Single teacher	141	55.0
Two teachers	80	31.3
Three teachers	18	7.0

Four teachers	4	1.6
Five teachers	3	1.2
Seven teachers	2	0.8
Job Description of Respondents		
Regular high school teacher	185	72.3
Middle school teacher	31	12.1
Young Farmer teacher	26	10.2
State staff member	8	3.1
Vocational or other administrator	2	0.8
Teacher trainer	2	0.8
Other	2	0.8

Table 2. Use of the Georgia Standards by Respondents (N=256)

Category	**Frequency**	**Percentage**
Used as the only evaluation instrument	48	18.8
Used as a shared evaluation instrument	84	32.9
Only used by the Agricultural Ed. Dept.	102	40.0
Not used at all	14	5.5
Other	7	2.7

Respondent Attitudes toward the Standards

Respondent Ratings of Evaluation Statements: The respondents ratings for the 34 evaluation statements about the GVATA Agricultural Education Standards are listed in Table 3. It can be seen that just ten items (29.4%) were in the "agree" or "strongly agree" category, as expressed by over 3.5 in mean rating. Conversely, only one item --

Use by the administration to base program funding… was in the “disagree” range, as indicated by less than 2.5 mean rating. Thus over two-thirds (67.6%) were in the “undecided” category. The large standard deviation, which averaged over 1.0, indicated that there was a relatively wide range of views toward the statements.

Relationship of Demographic Characteristics to Ratings of Evaluation Statements

Educational level: For group statistics educational level was divided into two categories: those who had a bachelors degree or less, and all others which included masters, specialist, and doctorate. When these two groups’ responses on the 32 items were compared by t-test, seven were significantly different (Items 1, 13, 14, 20, 27, 28, and 30).

Years of Experience: For years of experience the groups were divided into four categories of comparison. The first category was those up to 5 years; the second was those 6-15 years; the fourth was over 16 years. Using ANOVA, there were 24 statements that were significant at .05 alpha level: 1-7, 9, 11-15, 18-24, and 26-29. Of the 24, 12 were highly significant.

Age: The groups were divided into two age categories for comparison. The first category was for those under forty and the second was those over forty. There were 17 that were significant at .05 alpha level using the t-test: items 1, 6, 10-15, 17-23, 26 and 29. Of the 17, six were highly significant.

Gender: There were 13 items that were significant at the .05 level, using the t-test. The items were:3, 5, 9, 10, 13, 16, 20-21, 23, 29, 31, and 32. Of the 13, four were highly significant.

Ethnicity: The groups were divided into three categories; Caucasian, African-American, and other; 13 of the 32 items were significant and two of the 13 were highly significant, again using the ANOVA.

Size of school: ANOVA was also used to test the affect of size of the school on the ratings of the 32 items. The four major categories of size were used. The items were 1, 4, 5, 7, 14, 15, 19, 20,22, 23, 26, 28, and 31. Of the 13 that were significant, six were highly significant.

Table 3. *Respondent Ratings of Statements About the Standards (N=256)*

Item	Statement	Rating							
	The GVATA Agricultural Education Program Standards:	SD	D	U	A	SA	Mean	SD	D/U/A
1	Are flexible								
	#	39	78	49	87	3	2.75	1.12	U
	%	15.2	30.5	19.1	34.0	1.2			
2	Yield a fair evaluation for all Agricultural Education departments	55 21.5	60 23.4	36 14.1	88 34.4	17 6.6	2.81	1.29	U
3	Yield a fair evaluation for Agricultural Education instructors	47 18.4	58 22.7	40 15.6	99 38.7	12 4.7	2.89	1.24	U
4	Yield a fair evaluation for FFA chapters	20 7.8	56 21.9	41 16,0	124 48.4	15 5.9	3.20	1.10	U
5	Help to point out needed areas of improvement	4 1.6	8 3.1	36 14.1	162 63.3	46 18.0	3.93	0.76	A
6	Have a positive effect upon my personal performance	15 5.9	23 9.0	73 28.5	125 48.8	20 7.8	3.44	0.97	U
7	Have provided me with a harmonious understanding of the Agricultural Education program	11 4..3	24 9.4	105 41.0	96 37.5	19 7.4	3.33	0.93	U

Item	Statement	Rating							
	The GVATA Agricultural Education Program Standards:	SD	D	U	A	SA	Mean	SD	D/U/A
8	Have helped the school administration to focus on a positive understanding toward the Ag. Ed. dept.	24 9.4	52 20.3	69 27	93 36.3	18 7.0	3.11	1.10	U
9	Have assisted me through the promise of a stronger overall Ga. Agriculture Ed. program in the future	11 4.3	17 6.6	67 26.2	129 50.4	32 12.5	3.60	0.94	A
10	Have assisted in the promotion of a new/improved image of Agricultural Education/FFA	10 3.9	31 12.1	66 25.8	126 49.2	23 9.0	3.47	0.95	U
11	Have helped in procurement of tools, supplies, or other department needs	37 14.5	87 34.0	64 25.0	66 25.8	2 0.8	2.64	1.04	U
12	Have helped to increase salaries for Ag. Educators through extended day and/or extended year	38 14.8	50 19.5	95 37.1	68 26.6	5 2.0	2.81	1.05	U
13	Have increased the Agricultural Educators' morale	37 14.5	44 17.2	84 32.8	84 32.8	7 2.7	2.92	1.09	U
14	Have helped me to feel that I am a participant in the overall evaluation process for Ag. Educators	15 5.9	41 16.0	63 24.6	122 47.7	15 5.9	3.32	1.00	U
15	Are an equal means of evaluation for all Agricultural Education programs in Georgia	42 16.4	55 21.5	52 20.3	93 36.3	14 5.5	2.93	1.21	U

Item	Statement	Rating							
	The GVATA Agricultural Education Program Standards:	SD	D	U	A	SA	Mean	SD	D/U/A
16	Have helped to improve the statewide Georgia Agricultural Education Program	6 2.3	19 7.4	75 29.3	127 49.6	29 11.3	3.60	0.87	A
17	Have helped to increase program awareness for local administrators	8 3.1	58 22.7	59 23.0	108 42.2	23 9.0	3.31	1.02	U
18	Have helped to increase program awareness for counselors	30 11.7	86 33.6	80 31.3	51 19.9	9 3.5	2.70	1.03	U
19	Have a positive improvement approach for the Agricultural Education programs	3 1.2	30 11.7	71 27.7	124 48.4	28 10.9	3.56	0.88	U
20	Are a conclusive evaluation for all Agricultural Education departments	48 18.8	52 20.3	84 32.8	64 25.0	8 3.1	2.73	1.12	U
21	Have shown a progressive movement for the Georgia Agricultural Education Program	10 3.9	20 7.8	61 23.8	137 53.5	28 10.9	3.60	0.92	A
22	Set a useful goal for the beginning teacher of agriculture	5 2.0	15 5.9	38 14.8	170 66.4	27 10.5	3.77	0.82	A
23	Set a useful goal for the experienced teacher of agriculture	6 2.3	14 5.5	38 14.8	170 66.4	28 10.9	3.78	0.80	A
24	Help point out areas of the local department or program which could be improved	2 .08	11 4.3	32 12.5	162 63.3	49 19.1	3.96	0.75	A

Item	Statement	Rating							
	The GVATA Agricultural Education Program Standards:	SD	D	U	A	SA	Mean	SD	D/U/A
25	Make me feel that I must score 90-100 percent in order to be rated successful	6 2.3	18 7.0	54 21.1	112 43.8	65 25.4	3.82	0.99	A
26	Cause my administration to believe that I must score 90-100 percent in order to be rated successful	12 4.7	35 13.7	76 29.7	86 33.6	46 18.0	3.45	1.10	U
27	Are used by my administration to base program funding on the percent score achieved	58 22.7	64 25.0	99 38.7	31 12.1	3 1.2	2.43	1.02	D
28	Are responsible for a stronger local Agricultural Education program	26 10.2	38 14.8	74 28.9	103 40.2	15 5.9	3.17	1.08	U
29	May be easily modified	21 8.2	36 14.1	84 32.8	100 39.1	15 5.6	3.20	1.03	U
30	Evaluate equally the young farmer, high school, middle school, and area agriculture teachers	45 17.6	57 22.3	90 35.2	56 21.9	8 3.1	2.70	1.09	U
31	Help by suggesting a means of correction for program improvement	9 3.5	15 5.9	52 20.3	160 62.5	20 7.8	3.65	0.84	A
32	Have assisted me in a positive way through the promise of a stronger Ga FFA program in the future	9 3.5	14 5.5	63 24.6	133 52.0	37 14.5	3.68	0.91	A

Teacher Status: The teacher status was divided into 2 categories of single teacher departments and multiple teacher departments. Just two items, 2 and 3, were significant; none were highly significant.

Job Description: When ANOVA was used to compare responses cross tabbed by job description, just six items were non-significant, items 22, 23, 25, 26, 29, and 30. Of the 26 significant items, 19 were highly significant.

Use of Standards: When the four categories of use were analyzed using ANOVA, 18 items were significant at the .05 alpha level; of these 14 were highly significant (=/< .01). The items of significance were: 1-15, 16-20, 25, 27, and 30.

General Comments: Fifty-eight comments were made; of these 46 were critical or negative, 6 were positive, and 7 were problematic.

Conclusions

When demographics were analyzed, the following profile of respondents emerged: the average age of respondents was 40 years; the typical respondent had a masters degree or higher; average years of experience was 14.6 years; 85% were male; 91% were Caucasian and 8.2% were African-American; the largest group of respondents (32%) were from AA-size schools.

Most respondents reported that the Standards were only used by the Agricultural Education departments; however, many reported use of the Standards as a shared evaluation instrument; one-fifth indicated that it was the only evaluation used.

When the 32 evaluation statements were analyzed for frequencies and means by the total group, it was found that 20 items fell in the undecided category (means of 2.51-3.50), 11 items were in the agree category (means of 3.51-4.50) and only one item was in the disagree category (means of below 2.50).

A number of demographic characteristics appeared to affect attitudes toward the Standards. The characteristics that significantly affected ratings of more than one-third of the items were: Job Description (26 items); Years of Experience (24 items); Use of Standards (18 items); Age (17 items); Gender (13 items); Size of School (13 items); and Ethnicity (13 items). Educational Level and Number of Teachers in the School had little effect on the ratings given the statements.

Recommendations

The following recommendations are made, based on the above findings and conclusions:

1. Fairness in administration of the Standards should be paramount in their use.

2. The Standards should be promoted for statewide use in Agricultural Education department/teacher evaluation.

3. Inservice education programs should be provided to assist the one-third of the staff in understanding the benefits of the Standards for broader evaluation of the program and personnel.

4. Those items that were rated highly should be emphasized in inservice programs.

5. Items that were rated in the uncertain category should be reviewed and considered when revising the Standards.

6. The item rated lowest (on use of Standards by the administration for funding) should be analyzed and discussed at the next teachers' conference.

7. The demographic subgroups that disagreed with the overall ratings should be given attention when conducting inservice programs and when discussing modifications of the Standards.

8. Fears expressed in the comment section of the study should be reviewed and entered into the discussion at the next teachers' conference.

9. This study should be repeated on an annual or biennial basis, to reflect any changes in demographics.

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Competency Assessment and Human Resource Management Performance of County Extension Chairs

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Abstract

The purpose of this descriptive and correlational study was to examine perceptions of Ohio State University Extension county chairs regarding their human resource management competencies and performance of human resource management activities. The study also sought to describe the relationship between human resource management competencies and performance of human resource management activities of county chairs. County chairs were selected for study because they represent the first line of management most clientele and employees face. They also represent a group of Extension managers least likely to have formal education or specialized training in human resource management. The highest human resource management competencies perceived by county chairs were written comprehension, oral comprehension, written expression, information gathering, inductive reasoning, and problem sensitivity. The human resource management activities for which county chairs indicated the highest means were: developing and maintaining positive work environment, administering wages and benefits, ensuring safety and health at worksites, and selecting and hiring employees. The correlation between the summated competency and activity score was significant with a very strong relationship between the variables, $\underline{r}(86)=.71$, $\underline{p}<.05$.

Introduction

Skilled people are needed to coordinate the human, capital, and material resources required to accomplish the Cooperative Extension System's goals. These people, at varying levels of authority and responsibility, are accountable for the management of Extension. Management is inevitable and the job of management cannot be evaded (Drucker, 1977).

In performing their managerial duties, county chairs are responsible for planning, organizing, staffing or human resource management, leading, and controlling. To effectively and efficiently carry out managerial duties, county chairs need to possess relevant managerial behavior dimensions (Buford, Bedeian, & Lindner, 1995). There are several models that describe county chair managerial behavior dimensions. Managerial behavior dimensions for county chairs include oral communication, planning/organizing, leadership, decision making/judgment, initiative, objectivity, development of coworkers, perception, sensitivity, management control, collaborativeness, written communication, behavioral flexibility, organizational sensitivity, and assertiveness (Haynes, 1997). Essential managerial behavior dimension for county chairs include communication, public relations, leadership, planning, image building, budget accountability, decision-making, evaluation, staff support, and motivation (Whiteside & Bachtel, 1987). Both of these models, as well as others, include similar managerial behavior dimensions for county chairs. In reviewing these lists it is apparent that many of the managerial behavior dimensions focus on human resource management activities carried out by county chairs.

The evolving roles of Extension managers have closely mirrored that of its business contemporaries (Patterson, 1997). Because there is not a unified body of knowledge related to management in Extension the literature review relies heavily on the business school point of view placed within an Extension System context.

Perhaps the most significant divergence between Extension and business is that Extension almost exclusively recruits its managers from within, while businesses rely on both internal and formally educated and professionally trained external recruits. Other things being held equal, management is management, regardless of whether you are administering a six employee county Extension office or a boutique shop (Higgens, 1994). That is, the work of managers is virtually the same; it is the context in which management occurs that varies.

It is this divergence that results in Extension managers having less managerial competencies than their business contemporaries. To some this suggests that Extension should hire formally educated and professionally trained managers from outside the organization to manage its affairs (Campbell, 1999). To others this is a clarion call that suggests that Extension must improve its efforts to identify and develop the best internal candidates for management positions (Stone, 1997; Broshar & Jost, 1995).

It has been shown that Extension is in the business of identifying and training its employees for managerial positions (Smith & Clark, 1987). The lack of formal education and training does perpetuate the problems associated with making poor managerial decisions. Most decisions made by county chairs through use of trial and error and common sense, however, have little impact on productivity or success (Lindner, 1999; Griffiths, 1959). In other words, any decision would be adequate. There are areas of management where county chair's decision would have greater impact on productivity and success, thus, warranting added attention. The human resource management function of county chairs is one of these areas.

Extension, however can take solace in the fact that less than 35% of trained human resource professionals possess the necessary competencies (knowledge, skills, and abilities) to perform their jobs as described (Yeung, Woolcock, & Sullivan, 1996). A study of more than 3,000 managers found that while formal education was associated with success, the academic major itself was not particularly important (Duncan, 1978). In Extension, the county chair who has an undergraduate or graduate degree in management will be the exception rather than the rule.

The competency gap, therefore, between formally educated and professionally trained human resource management professionals and home grown county chairs may not be that great. Given the low level of competencies obtained through external recruitment, many businesses and organizations, including Extension, are identifying and training internal candidates for managerial positions. The basis tenant that is being followed is as follows: Successful employees are successful because they acquired competencies in one or more occupational fields and excelled at applying those competencies, therefore, there is no reason to believe such an employee could not obtain and apply necessary human resource management competencies.

Because competencies establish the requirements needed to perform a job, competency models can be used: as an employee recruitment and selection tool; as an employee assessment tool; as a tool to develop employee training and orientation curriculum; as a coaching counseling, and mentoring tool; and as a career development and succession planning tool (McLagan, 1996). For competency models to be useful, competencies must be correlated to job activities (Parry, 1998).

Purpose

The purpose of this study was to examine human resource management competencies and activities of Ohio State University Extension county chairs in staffing and human resource management.

The specific objectives of the study were:

1. To describe Ohio State University Extension county chairs with staffing and human resource management responsibilities by personal characteristics.

2. To describe Ohio State University Extension county chairs' perceptions of their human resource management competencies.

3. To describe Ohio State University Extension county chairs' perceptions of their ability to perform human resource management activities.

4. To examine relationships between the Ohio State University Extension county chairs' perceptions regarding human resource management competencies and their ability to perform human resource management activities.

Methods

The research design used for this study was descriptive and correlational in nature. The target population for this study was all Ohio State University Extension County Chairs. The population consisted of 96 Ohio State University Extension County Chairs. A census of the Ohio State University Extension County Chairs was conducted.

The questionnaire was divided into three parts. Knowledge, skill, and ability competencies are based on the US Department of Labor's Occupational Information Network (O*Net; Mumford, Peterson, & Childs, 1997) and a review of the literature (Buford, Bedeian, & Lindner, 1995). O*Net is a database of worker attributes and job characteristics that provides a national benchmark and common language for all users of occupational information. The first part was designed to measure the participants' perceived competency on 19 behavioral dimensions used to assess human resource management competencies. The participants were asked to indicate their current level of competence in each dimension using a five-point Likert-type scale. The points on the scale are: 1 = Very Low (VL); 2 = Low (L); 3 = Average (A); 4 = High (H); and 5 = Very High (VH). The second part was designed to measure the participants' perceived ability to perform 14 human resource management activities. The participants were asked to indicate their ability to perform each activity using a five-point Likert-type scale. The points on the scale are: 1 = Low (L); 2 = Marginal (M); 3 = Good (G); 4 = Excellent (E); and 5= Outstanding (O). The third part of the instrument was designed to gather data on demographic and personal characteristics.

Data for this study were collected using a mailed questionnaire. Dillman's (1978) general procedures for mailed questionnaires were followed. A response rate of 94% (n=90) was obtained for the study. Of the instruments returned, three were returned incomplete, resulting in a usable response rate of 91% (n=87). To control for non-response error late respondents (n=31) were compared to early respondents (n=56) on the variables: gender, age, tenure in Extension, tenure as chair, program focus, academic rank and summated human resource management competency and activity scores. No significant differences were found; therefore the results of the study are generalizable to the target population.

The instrument was pilot tested with a random sample of 30 county Extension directors in Indiana. Instrument reliability was estimated by calculating a Cronbach's alpha coefficient. Overall reliability for the instrument was .96. A panel of experts established instrument content and face validity. The magnitude of relationships was described using Davis' convention (Davis, 1971). Alpha for all statistical procedures was set a priori at .05.

Findings

This section presents a summary of findings by objective.

Objective 1

The first objective of the study was to describe Ohio State University Extension county chairs with staffing and human resource management responsibilities by personal characteristics. The personal characteristics of the study included gender, age, length of employment, tenure as county chair, level of education, additional training formats, program focus, and academic rank or position. The majority of respondents were male (57%). The average age of study respondents was 43. Approximately 52% of the participants were between the ages of 40 and 49 years. Twenty-eight percent of the participants were age 50 years or older. Twenty percent of the participants were between the ages of 20 and 39 years.

The average length of employment at Ohio State University Extension of county chairs was approximately 15 years. Approximately 52% of county chairs were employed by Ohio State University Extension for 1 to 15 years. The average length of tenure as an Ohio State University Extension County Chair was approximately 8 years. Eighty-seven percent of county chairs had been an Ohio State University Extension County Chair for 1 to 15 years.

A majority of county chairs (91%) had a Masters degree. A majority of county chairs had used the training formats workshops or seminar (88%), assessment center (83%), and self-directed learning (70%) to increase their human resource management knowledge. Thirty-three (38%) county chairs used the training format shadowing or mentoring. The training format formal class was used by 31% of county chairs.

Twenty-nine (34%) participants were from the agriculture and natural resources program area. Twenty-three (27%) participants were from the program area of 4-H/Youth Development and an equal number from family and consumer science. Ten (12%) chairs were from community development and other.

Forty-one (48%) chairs held the academic rank of Assistant Professor. Sixteen (19%) chairs were an Agent II rank. Eleven (13%) chairs were an Associate Professor rank. Eight (9%) participants were an Agent III rank. Chairs with the rank or position of Instructor, Professor, Agent I, Agent IV, or other comprised the remaining 11%.

Objective 2

The second objective of the study was to describe Ohio State University Extension county chairs' perceptions of their human resource management competencies. Table 1 presents the means and standard deviations of human resource management competencies. Seven human resource management competencies had means greater that 4.0: written comprehension (M=4.23, SD=.66), oral comprehension (M=4.21, SD=.73), oral expression (M=4.21, SD=.78), written expression (M=4.17, SD=.82), information gathering (M=4.16, SD=.75), inductive reasoning (M=4.15, SD=.76), and problem sensitivity (M=4.09, SD=.76). The four lowest human resource management competencies means were: administration and management (M=3.71, SD=.81), mathematical reasoning (M=3.61, SD=.99), systems perception (M=3.53, SD=.80), and human resources (M=3.46, SD=.77). A human resource management competency score (74.1) was computed by summing the individual human resource management competency item responses. The average of human resource management competencies was 3.9.

Table 1. *Human Resource Management Competencies of Ohio State University Extension County Chairs*

Human Resource Management Competency	M	SD
Written Comprehension-Ability	4.23	.66
Oral Comprehension-Ability	4.21	.73
Oral Expression-Ability	4.21	.78
Written Expression-Ability	4.17	.82
Information Gathering-Skill	4.16	.75
Inductive Reasoning-Ability	4.15	.76
Problem Sensitivity-Ability	4.09	.76
Problem Identification-Skill	3.95	.68
Fluency of Ideas-Ability	3.85	.74
Identification of Key Causes-Skill	3.82	.74
Solution Appraisal-Skill	3.82	.66
Visioning-Skill	3.80	.89
Management of Personnel Resources-Skill	3.78	.72
Identifying Downstream Consequences-Skill	3.77	.76
Originality-Ability	3.77	.83
Administration and Management-Knowledge	3.71	.81
Mathematical Reasoning-Ability	3.61	.99
Systems Perception-Skill	3.53	.80
Human Resources-Knowledge	3.46	.77
Average HRM Competency score	3.90	

Note:1=Very Low;2=Low;3=Average;4=High;5=Very High. Summated HRM competency score=74.1.

Objective 3

The third objective of this study was to describe Ohio State University Extension county chairs' perceptions regarding their ability to perform human resource management activities.

The means and standard deviations of human resource management activities are given in Table 12. The activities for which Ohio State University Extension County Chairs indicated the highest means were: developing and maintaining positive work environment (M=3.85, SD=.76), administering wages and benefits (M=3.77, SD=.74), ensuring safety and health at worksites (M=3.77, SD=.77), and selecting and hiring employees (M=3.74, SD=.78). The activities for which county chairs indicated the lowest means were: motivating employees (M=3.44, SD=.77), analyzing jobs and writing job descriptions (M=3.39, SD=.87), and appraising and counseling employees for performance (M=3.37, SD=.84). A human resource management activity score (50.1) was computed by summing the individual human resource management activity item responses. The average of human resource management activities was 3.6.

Table 2. *Human Resource Management Activities of Ohio State University Extension County Chairs*

Human Resource Management Activity	M	SD
Developing and Maintaining Positive Work Environment	3.85	.76
Administering Wages and Benefits	3.77	.74
Ensuring Safety and health at Worksites	3.77	.77
Selecting and Hiring Employees	3.74	.78
Legal Aspects of Recruiting and Selection	3.60	.91
Organizing and Designing Jobs	3.57	.74
Orienting, Training, and Developing Employees	3.56	.69
Complying with Legal Aspects of Compensation	3.55	.88
Complying with Fair Employment Laws and Regulations	3.52	.79
Human Resource Planning and Policy Development	3.52	.71
Identifying and Coaching to Resolve Employee Problems	3.51	.78
Motivating Employees	3.44	.77
Analyzing Jobs and Writing Job Descriptions	3.39	.87
Appraising and Counseling Employees for Performance	3.37	.84
Average HRM Activity score	3.58	

Note:1=Low;2=Marginal;3=Good;4=Excellent;5=Outstanding. Summated HRM activity score=50.1.

Objective 4

The fourth objective of the study was to examine relationships between the Ohio State University Extension county chairs' perceptions regarding human resource management competencies and their ability to perform human resource management activities. Figure 1 portrays the nature of the relationship between summated human resource management and activity scores. Visual inspection of the data showed that the elliptical swarm of points tended to fall along a straight line. This led the researcher to conclude the relationship examined was linear. The correlation between the summated competency and activity score was significant with a very strong relationship between the variables, $r(86)=.71$, $p<.05$.

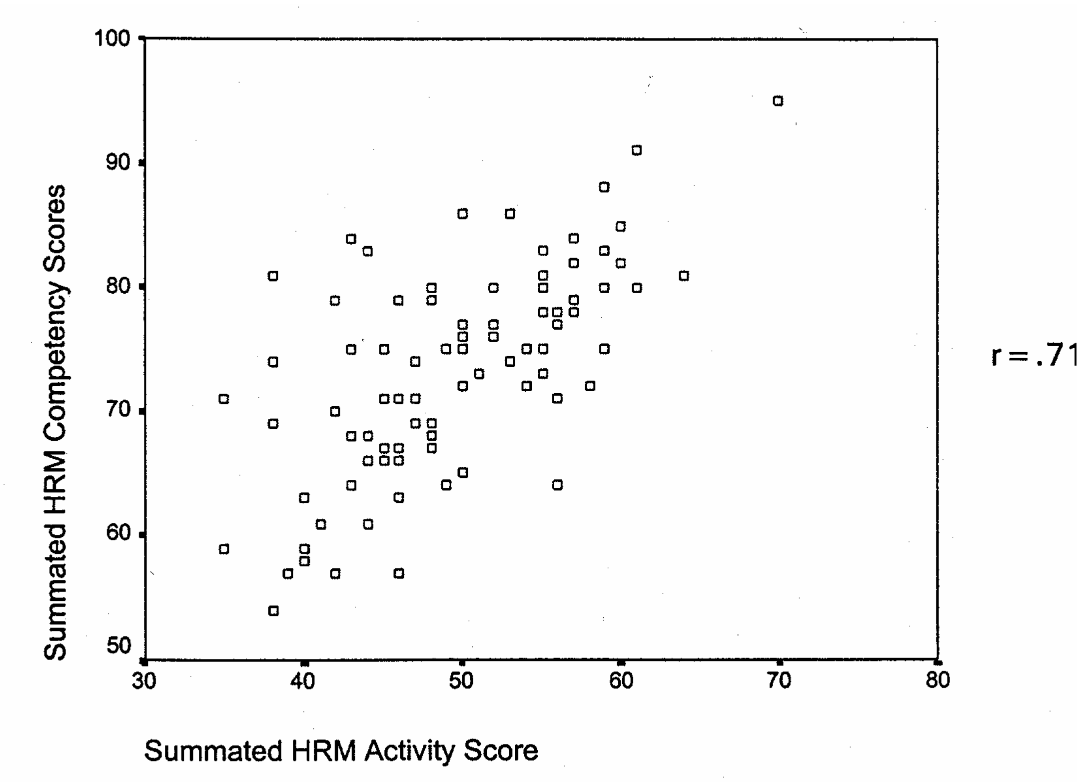

Figure 1. *Correlation of Relationship Between Summated Human Resource Management Competency Score and Activity Score.*

Conclusion and Implications

Based on the review of literature and the interpretation of findings related to study objectives the following conclusions were drawn and implications given.

Conclusion 1

Ohio State University Extension County Chairs perceived their level of performance as good to excellent on the fourteen identified human resource management activities. Using means as indicators, county chairs had the highest levels of performance on the following human resource management activities: developing and maintaining positive work environment, administering wages and benefits, ensuring safety and health at worksites, and selecting and hiring employees. Lowest levels of performance for county chairs were: motivating employees, analyzing jobs and writing job descriptions, and appraising and counseling employees for performance.

Implication

In this study lower level of performance on analyzing jobs and writing job descriptions is of concern because job analysis is the most basic activity in human resource management. It is the basis from which most human resource management decisions are made (Mathis & Jackson, 2000). Lower levels of performance on appraising and counseling employees are consistent with other research findings. It has been found that managers have disdain for appraising employee performance because they are not properly trained, do not feel like they have control over the process, do not like to deliver negative feedback and messages, feel negative feedback and messages will adversely affect a person's career, and feel their performance will be judged unfavorably if the work of those they supervise is poor (Thomas, & Bretz, 1994). Performance appraisals are often used in counseling and motivating employees, which may help explain the lower scores reported.

Conclusion 2

Ohio State University Extension County Chairs perceived their level of competence as high to very high on seven human resource management competencies and average to high on twelve. Using means as indicators, county chairs had the highest levels of competence on the following human resource management competencies: written comprehension, oral comprehension, written expression, information gathering, inductive reasoning, and problem sensitivity. Lowest levels of competence for county chairs were: administration and management, mathematical reasoning, systems perception, and human resources.

Implication

Performance of any activity requires certain knowledge competencies. Knowledge required for a job is restricted to the information that is directly applied to the performance of an activity and is acquired through formal education, training, and experiences (Fleishman, Constanza, Wetrogan, Uhlman, and Marshal-Mies, 1995). Some human resource management knowledge, such as constructing a Markov Matrix, would almost always be acquired through formal education. Other human resource management knowledge, such as conducting an interview may be acquired through training and life experiences. Knowledge of human resource policies and practices including laws and regulations involved in recruiting, selecting, compensation, and fair employment are needed to carry out human resource management activities. Low human resource knowledge competencies are a fundamental concern that should be addressed through a combination of formal education, training, and development.

Knowledge of administration and management principles and processes involved in business and organizational planning, coordination, and execution are also needed to carry out human resource management activities. Lower administration and management knowledge competencies are a concern that should be addressed through training and development.

Failure of county chairs to refer to and apply generally accepted human resource management and management knowledge might result in negative outcomes. In addition to being used as a developmental tool, Haynes (1997) recommended that competency assessment be used as a selection tool for filling county chair positions. Given the strength and direction of correlations between competencies and performances found in this study and those of Haynes and Kwarteng, Haynes' recommendation is well placed. As Smith and Clark (1987) noted, Extension is in the business of finding and developing its managers.

Conclusion 3

Ohio State University Extension County Chairs who reported higher human resource management competency scores had significantly higher human resource management activity scores. Haynes (1997), Ishaya (1991), Yukl (1989), and Kwarteng (1986) found similar results when comparing managerial competencies of county chairs to success in carrying out managerial activities.

Implication

Recognizing that Extension cannot centralize all human resource management functions, substantial resources are used to recruit and train Ohio State University Extension County Chairs to perform front line managerial tasks (Smith & Clark, 1987). Because county chairs tend to be promoted from within based on their successes in their subject matter discipline (Patterson, 1997), competency assessment has become an important managerial developmental tool (Haynes, 1997) and provides a basis for competency based training and development. It has also been shown that competency based training programs are more flexible and durable than activity based programs (McNerney, and Briggins, 1995; Lawler, 1994). These findings suggest a need for Ohio State University Extension County Chair competency based training regarding human resource management.

As Parry (1998) noted, a competency model must include competencies that are correlated with performance on the job. Because competencies can be influenced by an individual's personality type, biological function, social style, and/or personal styles and values competency models must be broad enough to allow for individuals to offset weaknesses on certain competencies with strengths on others. The correlations presented here provide the necessary empirical evidence to support an Ohio State University Extension Human Resource Management Competency Model that includes the following behavioral dimensions: written comprehension, oral expression, written expression, oral comprehension, inductive reasoning, problem sensitivity, originality, fluency of ideas, mathematical reasoning, management of personnel resources, identification of key causes, problem identification, information gathering, solution appraisal, visioning, identifying downstream consequences, systems perception, human resources knowledge, and administration and management knowledge.

Recommendations

The results of this study provide the framework from which the following recommendations are made.

1. The results of this study can be used by Ohio State University Extension Employee Development Network as basis for understanding which human resource management competencies are correlated to the performance of human resource management activities.

2. The Employee Development Network can use these results as a basis for providing targeted competency based job analysis and performance appraisal training and development programs.

3. The Employee Development Network can use these results to continue to develop and implement training and development programs on the body of knowledge pertaining to human resource management and administration and management.

4. Replication of this study with other Extension Services and organizations is needed to evaluate the extent to which the results presented here would be similar and recommendations applicable. Additional research related potentially discriminating variables that may affect the results presented here are needed.

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