

FIFTEEN-YEAR ENROLLMENT TRENDS RELATED TO THE THREE COMPONENTS OF COMPREHENSIVE AGRICULTURAL EDUCATION PROGRAMS

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Abstract

The purpose of this study was to identify the agricultural education enrollment trends in Iowa using 15 years of data collected from 1991 to 2005. It was found that agricultural education enrollment, Supervised Agricultural Experience (SAE) participation, and FFA membership have grown. Using annualized growth rates, agricultural education enrollment (4.06%) grew more rapidly than SAE participation (1.65%) and FFA membership (2.39%). Although growth was realized in all three components, the widening gap between students who only enroll in agricultural education and those who also choose to participate in SAE and FFA is a concern. Increased female participation, 31.96% in 2005, accounted for much of the overall growth in total enrollment. SAE growth was attributed to increased participation in agriscience and agribusiness. The findings have implications for the profession's ability to put into practice experiential learning theory, the philosophical approach of agricultural education, local program development and management, and the future of agricultural education.

Introduction

“Agricultural education programs in the public schools are designed to accomplish educational objectives that pertain specifically to acquiring appreciation, understanding, knowledge, and skills applicable to the agricultural sciences, agribusiness, and the production and processing of food and fiber” (Newcomb, McCracken, Warmbrod, & Whittington, 2004, p.10). These educational objectives have been achieved through a variety of methods, the most prominent of which have been the classroom and laboratory instruction, FFA, and Supervised Agricultural Experience (SAE) (Newcomb et al.). Those components make up a comprehensive secondary agricultural education program.

It is the combination of these components (classroom instruction, FFA, and SAE) that enhance the educational experience. Theories and principles of

agriculture are presented in the classroom and laboratory, many times using experiential learning teaching methods. Concepts learned in the classroom are then used as the foundation for further development in the FFA and SAE programs, where students are able to practically apply their education in real-world situations, often in an individualized manner.

The SAE program is an individualized, planned experience and is not new to the profession (Barrick et al., 1992). Talbert, Vaught, Croom, and Lee (2007) define SAE as “the application of concepts and principles learned in the classroom in planned, real-life settings under the supervision of the agricultural teacher” (p. 418). SAE is experiential “because it allows students to apply practices and principles learned in the classroom and to develop new skills and abilities” (Newcomb et al., 2004, p. 243). Supervised experience is important because it improves student learning, personal development, and occupational

development (Newcomb et al.), all of which are needed in a comprehensive agricultural education program (Phipps & Osborne, 1988).

The aim of the National FFA Organization is to develop students' "potential for premier leadership, personal growth and career success through agricultural education" (National FFA Organization, 2007, *The FFA Mission*). FFA is another form of laboratory learning in agricultural education (Newcomb et al., 2004). Newcomb et al. stated that FFA must be planned, organized, and structured to fit into the context of the classroom. The FFA is an intra-curricular component of agricultural education and serves as the vehicle for developing leadership and human relation skills (Phipps & Osborne, 1988).

Theoretical Framework

The theoretical framework for this study is grounded in experiential learning. John Dewey (1938) believed that there was an "organic connection between education and personal experience" (p. 25) and that the educational impact is dependent on the quality of the experience and its ability to influence later experiences. He also promoted what he called the principle of continuity of experience. Dewey (1938) defined continuity of experience as a means by which "every experience both takes up something from those which have gone before and modifies in some way the quality of those which come after" (p. 35). Kilpatrick (1918) expanded upon this idea and posited that the project method is a form of education that is grounded in purpose and has utility for learning.

David Kolb, who drew primarily on the works of Dewey, Kurt Lewin, who stressed the importance of active learning and individual's involvement in learning, and

Jean Piaget, who described intelligence as the result of the interaction of the person and the environment, have influenced the study of experiential learning (Smith, 2001). Kolb (1984) defined experiential learning as a "means for examining and strengthening the critical linkages among education, work, and personal development" (p. 4). He suggested that knowledge is created as a result of the "combination of grasping experience and transforming it" (p. 41).

Experiential learning in secondary agricultural education has been a hallmark (Moore & Krueger, 2005). Knobloch (2003) and Roberts (2006) have helped define the theoretical underpinnings of experiential learning for agricultural education. Knobloch identifies four tenets of experiential learning, which are learning through real-life context, learning by doing, learning through projects, and learning through problem solving. He concludes that these tenets also align with authentic learning standards and provide a sound psychological framework for learning. In a synthesis of experiential learning, Roberts describes experiential learning from two perspectives. First, it is process-based and cyclical in nature. Such learning requires initial focus of the learner, initial experience or experimentation, reflection, and generalization before going into another iteration of the cycle. The second perspective is based upon experience within four contexts: level, duration, intended outcomes, and setting.

Conceptual Framework

The agricultural education profession has long espoused a theory of learning in secondary programs that encompasses classroom and laboratory experiences, active membership in FFA, and participation in SAE. Newcomb et al. (2004) in their text, *Methods of Teaching Agriculture*, suggest

that SAE and FFA are the “vehicles for the application of learning” that occurs in classroom instruction (p. 211). Talbert et al. (2007) use a Venn diagram to demonstrate the relationship among the three components and stress the need for all three to achieve the complete educational benefit.

Research has supported the case for a comprehensive agricultural education program. Cheek, Arrington, Carter, and Randell (1994) found SAE and FFA to be positively related to student achievement in agriscience. Myers, Breja, and Dyer's (2004) focus group study validated the role of SAE and FFA as integral components of agricultural education. However, the same focus group raised SAE and FFA as issues facing the profession. The authors reported that agricultural teachers were concerned that SAE has evolved from a focus on experiential learning to one of record-keeping systems while FFA has become more focused on competition rather than an extension of instruction.

If the profession was to put these theories into practice, one would expect that all students enrolling in secondary agricultural education courses would also participate in SAE and become a member of FFA. Researchers have studied classroom enrollment, SAE participation, and FFA membership and have identified issues that limit complete participation.

Research has indicated that recruitment and retention issues have impacted agricultural education classroom enrollments. Dyer and Breja (2003) reported that requiring SAE served as an obstacle in recruiting students into agriculture programs. Other issues impacting recruitment and retention of students in agricultural education classes include scheduling, involvement in other activities, increased graduation requirements, image of agriculture, lack of interest in agriculture, block scheduling, and college entrance

requirements (Dyer & Breja; Dyer, Breja, & Ball, 2003).

Teachers conceptually support SAE but generally have difficulty implementing SAE into their programs (Dyer & Osborne, 1995). The same issues that impact classroom enrollment also impact SAE and have been a problem for some time. In 1986, Foster identified a lack of facilities, student desire, lack of student interest in recordkeeping, the competition for students' time, and teacher time for supervision as causes for the lack of SAE participation. Arrington (1985) reported that females and minorities were underrepresented. Later, Dyer and Osborne, in their synthesis of SAE, reported a large variance in SAE participation among states. The authors also found that participation varies widely by state and is dependent on demographics.

Talbert and Balschweid (2004) have studied FFA participants and non-participants. They found that students who are FFA members are more likely to have an SAE and believe their agriculture classes help with career preparation. Talbert and Balschweid also discovered that internal, personal reasons were the greatest influence on whether or not students elected to participate.

The review of the literature showed that participation and enrollment research has been segregated according to the individual components of secondary agricultural education. No research has been conducted to understand the combination of all three components and their relationship to one another. In addition, no trend studies on agricultural education enrollment, FFA membership, or SAE participation have been published.

Purpose and Objectives

The purpose of this study was to identify the enrollment trends of comprehensive

agricultural programs in Iowa using 15 years of data collected from 1991 to 2005. In order to accomplish this purpose, three research objectives were identified:

1. Determine the enrollment trends for agricultural education, SAE participation, and FFA membership in comparison to one another;
2. Identify the relationship among agricultural education enrollment, SAE participation, and FFA membership in the secondary agricultural education program; and,
3. Determine enrollment trends in agricultural education as they relate to gender.

Methods

This causal-comparative research study focused on the enrollment and participation trends in Iowa's secondary agricultural education programs. Enrollment and SAE data were collected from two sources and served as the raw data for the study. The Iowa Governor's Council on Agricultural Education (2001) in conjunction with the Iowa Department of Education (DE) (2005) has collected data on agricultural education annually since fiscal year (FY) 1991. From FY 1991 to FY 2001 (11 years), aggregate student data were reported by each agricultural education program and collected by the Iowa Bureau of Technical and Vocational Education (n.d.) using a paper form that was mailed through the U.S. Postal Service. The same form was used for all 11 years. For FY 2002 to FY 2005, individual student data were collected locally and reported electronically to the DE. It should be noted that the change in the reporting method seemed to influence the reported enrollment numbers. Data provided using both collection methods included the number of students in SAE by

category, the unduplicated number of students enrolled in agricultural education, and the total number of students in SAE programs. Other demographic data were unavailable for the entire period of the study.

Other raw data for this study were provided by the Iowa Bureau of Financial and Information Service within the DE (2005). These data were collected annually as part of the requirements for local school districts to receive state and federal reimbursement. Data were provided for total enrollment in agricultural education as well as totals for males and females. These totals represent some duplication of students because program leaders were asked to report the number of students in each course offered. Each school district with an agricultural education program is required to submit this report.

FFA membership data were provided by the Iowa FFA association (2005). These numbers represent the annual number of paid FFA members in the state from 1991 to 2005. A breakdown of FFA membership by gender for the entire time period of the study was not available.

The methods used to answer the research objectives were the calculation of percentages and annualized growth rates (AGR). Boccuti and Moon (2003) recommended growth rates to examine an extended period of time, calculate cumulative impacts, and compare like data. The annualized growth rate formula used in this study was:

$$AGR = \left(\frac{Yr05}{Yr91} \right)^{\left(\frac{1}{\#Yr-1} \right)} - 1$$

where AGR is the annualized growth rate; Yr05 is the ending year (2005); Yr91 is the beginning year (1991); and #Yr is the number of years.

Enrollment numbers obtained from the Iowa Governor's Council on Agricultural

Education (2001) were used for this study because local agricultural teachers were required to report unduplicated numbers. Since the Governor's Council did not collect enrollment by gender, data retrieved from the DE Bureau of Financial and Information Services (2005) were used to meet the third objective. The five SAE categories reported in this study are based upon the reporting categories for data collection. All SAEs had to be reported within one of these five categories.

The data used in this study were 15 years of self-reported data from local agricultural teachers and collected by the DE. Caution should be made in attempting to interpret any given year's data; however, the trends realized over the 15 years do provide insight into participation related to the three components of agricultural education.

Findings

The first research objective was to compare the growth trends of the three components of agricultural education. The trend lines representing agricultural education enrollment, FFA membership, and SAE participation are represented in Figure 1. There is a considerable gap between the total number of students enrolled in agricultural education compared to those who elected to participate in SAE and FFA; and, this gap appears to be widening.

Enrollment comparisons by growth are found in Table 1. From FY 1991 to FY 2005, agricultural education enrollment grew at an annualized rate of 4.06%, while FFA membership grew at 2.39%, and SAE participation grew at 1.65%.

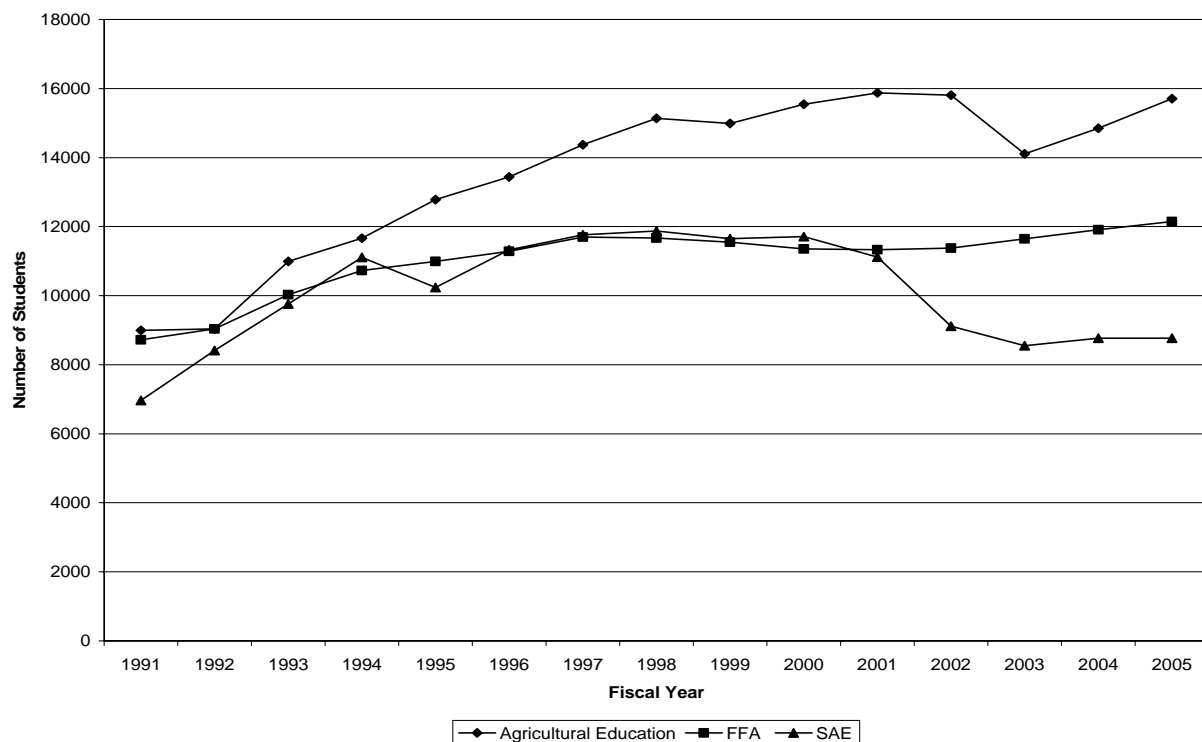


Figure 1. Fifteen-year enrollment trends for agricultural education enrollment, FFA membership, and SAE participation.

Table 1
Enrollment Comparisons by Growth Rate and Percentage¹

Year	Agricultural Education	FFA	SAE	% of Ag Ed w/ FFA	% of Ag Ed w/ SAE
1991	9000	8722	6969	96.91	77.43
1992	9040	9039	8410	99.99	93.03
1993	10994	10029	9758	91.22	88.76
1994	11663	10728	11108	91.98	95.24
1995	12784	10994	10235	86.00	80.06
1996	13440	11284	11327	83.96	84.28
1997	14373	11696	11760	81.37	81.82
1998	15140	11671	11878	77.09	78.45
1999	14990	11548	11654	77.04	77.75
2000	15543	11356	11712	73.06	75.35
2001	15871	11330	11120	71.39	70.06
2002 ²	15810	11379	9120	71.97	57.69
2003 ²	14106	11649	8549	82.58	60.61
2004 ²	14850	11909	8766	80.20	59.03
2005 ²	15707	12145	8768	77.32	55.82
AGR	4.06%	2.39%	1.65%		

¹Unduplicated enrollment numbers were used.

²Changes in DE reporting caused an adjustment in students with SAE (Gruis, D., personal communication, November 11, 2005).

The AGR for the five primary categories of SAE were calculated (Table 2). The number of students choosing agriscience projects grew dramatically (14.27%). Both business ownership (9.85%) and agribusiness placement (8.01%)

categories grew moderately. Production placement grew at a rate of 4.87%. SAE, which focused on production ownership, realized a negative annualized enrollment growth over the 15 year period (-0.54%).

Table 2
Annualized Growth Rate of SAE Categories

Categories	%
Business ownership	9.85
Production ownership	-0.54
Agribusiness placement	8.01
Production placement	4.87
Agriscience projects	14.27

The second objective, to identify the relationship among the three components of agricultural education, was met by comparing the percentages of students participating in SAE and FFA to the total numbers of students enrolled (Table 1). The percentage of agricultural education students who became FFA members dropped considerably from 96.91% in FY 1991 to 77.32% in FY 2005. A similar trend

was realized when the percentage of agricultural education students who participated in SAE was calculated. In the early 1990s, over 85% of agricultural students were participating in SAE. By 2005, only 55.82% of the students were involved. The trend lines depicting the percentage of agricultural students who were FFA members and/or SAE participants can be found in Figure 2.

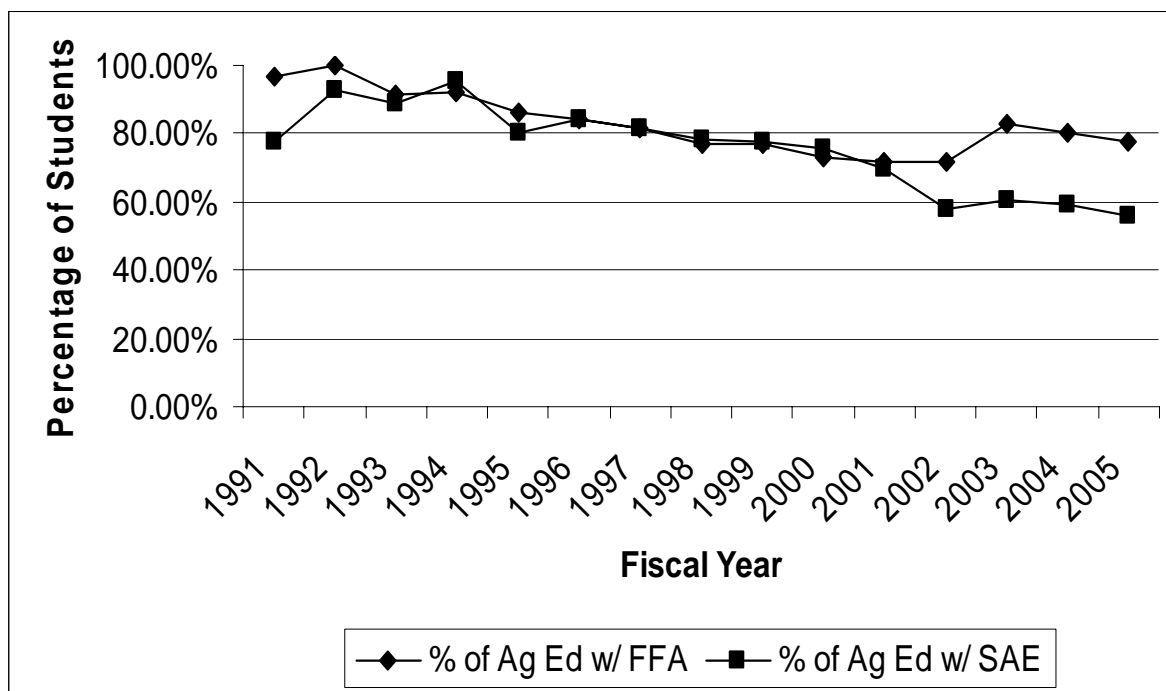


Figure 2. Percent of ag ed students who were FFA members or participants in SAE.

The third objective of this study was to determine the enrollment trends in agricultural education based upon gender. Total enrollment grew at an annualized rate of 1.27% from FY 1991 to FY 2005. During that time period, female enrollment more than doubled, with a growth rate of 6.74%. Male enrollment decreased and had an annualized growth rate

of -0.30%. The percentage of males enrolled in agricultural education declined from 84.71% in FY 1991 to 68.04% in FY 2005, while female enrollment increased from 15.29% to 31.96%. Figure 3 is a graphical representation of total enrollment trends by gender. Female enrollment has grown steadily since FY 1991.

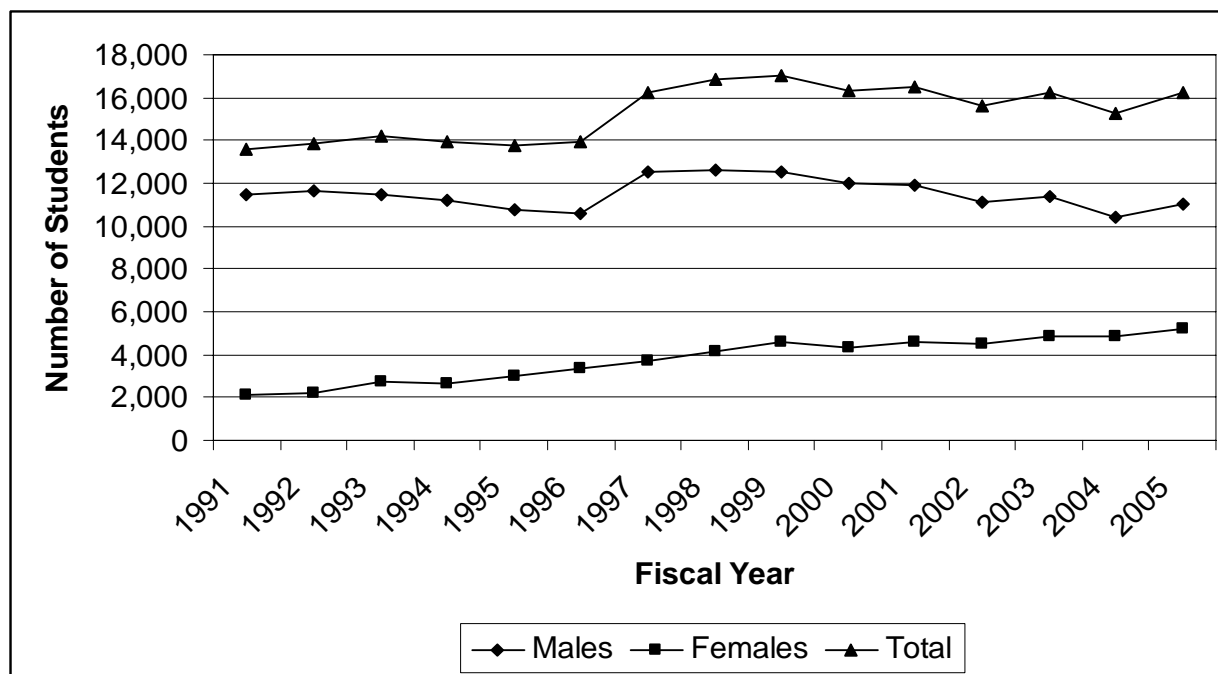


Figure 3. Fifteen-year agricultural enrollment trends by gender.

Conclusions, Implications, and Recommendations

Four conclusions can be made based on the findings of this trend study. First, the number of students in agricultural education in Iowa grew over the 15-year period of the study. Most of the growth in total enrollment can be attributed to female enrollment, which grew from 15.29% in FY 1991 to 31.96% in FY 2005. Second, as a percent, fewer students received the benefit of a complete program as espoused by Talbert et al. (2007) and evidenced by the growing gap between students enrolled in agricultural education courses and students who also participated in SAE and/or FFA (Table 1). Third, SAE growth areas are agriscience and agribusiness. When

analyzing the annualized growth rates of the five SAE categories used in the state, agribusiness (ownership and placement) and agriscience grew at a much faster rate than production-related SAEs. Fourth, based on the analysis of the data in this study, it also may be concluded that the increase in agricultural education enrollment may have created other problems for secondary educators that limit the comprehensive approach to agricultural education.

The evidence from this study and related conclusions have implications for the agricultural education profession regarding the utilization of experiential learning; program development and management; the philosophical approach to the comprehensiveness of agricultural education; and the future of the profession.

Because fewer students are taking advantage of the comprehensive nature of agricultural education, they have fewer experiential learning opportunities. Research within and outside of our profession has provided the basis for its incorporation (National Research Council, 2000; Newcomb et al., 2004; Talbert et al., 2007), but the profession has failed to fully integrate experiential learning into all aspects of a comprehensive agricultural education program. Researchers have identified experiential learning as a means for contextual learning, problem solving, and learning by doing. More students in this career and technical education area would benefit from experiential learning that occurs through SAE and FFA.

It could be concluded that increased enrollments lead to larger local agricultural programs. These larger local programs may also have implications to agricultural educators' abilities to fully implement and manage a comprehensive agricultural education program. Although growth is generally perceived as positive, it does come at a cost and creates a need for continual change. Today's educators are confronted with greater expectations and more accountability in the classroom and are charged with meeting these expectations with fewer available resources. Because expectations are growing, educators are faced with less time to develop, plan, and conduct a comprehensive agricultural education curriculum, which includes the management of more varied FFA activities and the supervision of individualized and more diversified SAE programs. Perhaps educators have not been able to successfully adapt to increased classroom enrollments, expectations of local administrators, and accountability while meeting the expectations of a comprehensive agricultural education program.

The trends reported in this study bring into question the profession's philosophical approach to the comprehensive nature of our agricultural education programs, or the lack thereof. The profession needs to solidify the philosophical approach of agricultural education, whatever it may be, so that it reflects what the profession is attempting to

achieve in practice. Should SAE and FFA continue to be an integral part of secondary agricultural education even though the results of this study provide an indication that it is not occurring in practice? Does the current secondary agricultural education paradigm, which is often depicted using a Venn diagram, fit modern agricultural education? Would it be more appropriate to use Newcomb et al.'s (2004) approach, which focuses on teaching and learning while using laboratory, FFA, and SAE as forms of application? Or, is there a better way? Whatever the answer to these questions, consistency is needed across the state and nation in communicating and implementing the profession's philosophy.

Based upon the enrollment trends found in this study and the questions raised, it is recommended that agricultural educators continue to discover and evaluate the changes that have caused classroom enrollment to increase while the gap between classroom enrollment and SAE participation and FFA membership has widened during the past 15 years. Although we can speculate, we really don't know all the issues that might be causing this trend. Further research to identify the cause of these trends would help with program improvement.

Additional questions and issues were uncovered in this study. First, the authors suggest that more states evaluate enrollment trends. State, regional, and national enrollment data need to be studied to determine if the results found in this state reflect agricultural education on a larger scale. Second, more research must be conducted with secondary educators to determine the impact of higher enrollments and to learn more about managing larger, more-diverse classes. Third, current and prospective agricultural students should be studied. The profession would benefit from better understanding the reasons why students elect to either enroll or not enroll in the various components of agricultural education. Such an understanding would benefit the recruitment and retention of students and assist educators with programmatic planning and curriculum development. Finally, perhaps a needs

assessment of both agricultural educators and students should be considered.

If the historical growth rates are any prediction of future growth, without any intervention, the gap between agricultural education enrollment and FFA membership and SAE participation will only become more significant. What will happen to the agricultural education profession if these trends continue?

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This paper is a product of the Iowa Agriculture and Home Economics Experiment Station, Ames, Iowa. Project No. 3613 and sponsored by the Hatch Act and State of Iowa.