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THE SHORTAGE OF LICENSED  
SECONDARY AGRICULTURE  
INSTRUCTORS IN ILLINOIS: AN  
EXAMINATION OF THE IMPACT ON  
SECONDARY AGRICULTURAL  
EDUCATION PROGRAM QUALITY

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THE SHORTAGE OF LICENSED SECONDARY AGRICULTURE INSTRUCTORS IN  
ILLINOIS: AN EXAMINATION OF THE IMPACT ON SECONDARY  
AGRICULTURAL EDUCATION PROGRAM QUALITY

By

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B.S., Western Illinois University, 1982  
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A Dissertation  
Submitted in Partial Fulfillment of the Requirements for the  
Doctor of Philosophy

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Department of  
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May 2018

DISSERTATION APPROVAL  
THE SHORTAGE OF LICENSED SECONDARY AGRICULTURE INSTRUCTORS IN  
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for the Degree of

Doctor of Philosophy

in the field of

Agricultural Education

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## AN ABSTRACT OF THE DISSERTATION OF

Howard K. Heavner, for the Doctor of Philosophy degree in Agriculture Education,  
presented on 5<sup>th</sup>, of April 2018, at Southern Illinois University Carbondale.

TITLE: THE SHORTAGE OF LICENSED SECONDARY AGRICULTURE INSTRUCTORS  
IN ILLINOIS: AN EXAMINATION OF THE IMPACT ON SECONDARY  
AGRICULTURAL EDUCATION PROGRAM QUALITY

MAJOR PROFESSOR: Dr. Seburn L. Pense

This dissertation employed a 5-year longitudinal repeated measures research design that examined whether the shortage of licensed high school agriculture teachers in Illinois impacted the quality of Illinois programs. Due to the shortage of licensed agriculture teachers, the hiring of provisional instructors doubled over the five-year study. Every high school agriculture program in Illinois, from fiscal year 2014 to fiscal year 2018, was included in this study. Each school's Incentive Funding Grant application was explored using data mining to collect the overall X-scores, and all the quality indicators the individual schools achieved.

Results indicated that schools with licensed instructors had X-scores 18.3 percent higher than schools with provisional instructors. Specific quality indicators were also evaluated, which related to SAE, FFA, and classroom instruction. Achievement of those activities illustrated wide gaps between schools with provisional and schools with fully licensed instructors.

Significant differences were found in the quality of programs based on areas other than license such as: gender of instructors, length of teacher's contract, retention of instructors, participation in career development events, and geographic region. Results of this study suggested the Illinois State Board of Education and the universities develop a path for provisional instructors to receive full licensure without leaving their teaching positions.

## DEDICATION

I wish to dedicate this dissertation to my family for their support in the completion of this study. A special thank you goes to my parents Robert and Dorothy Heavner for their encouragement throughout my life. I benefited greatly by spending time with and learning from all four of my grandparents, and yes that is absolutely priceless on the journey of life. Heavner<sup>7</sup> is more than a name or a number it is a family. I dedicate all my efforts over the years to them. My children are all exceptional. Ryan, Anna, Andrew, Joseph, and Jonathan. I wish I could have been as smart and talented as all of you are. It might have made life a little easier, but that is okay. My grandchildren AJ, Baley, Audrey, and Ethan and hopefully several more to come.

Dedicating this to my wife goes without saying. You set the path for me. You went down the road to a PHD many years ago. I can never thank you enough. Simple words can't describe you or our relationship, so I will name a few of my favorite songs that I feel explain it the best. This may be a top five that are in no particular order, except the last selection. I will start out with living our love song it's about a bare foot boy and a fairytale princess. How about Brad Paisley's, he has several "Waiting on a Woman" (better skip that one), "Time Well Wasted", "She's Everything to me", and Then. Alan Jackson's "remember when" definitely applies to us. Doug Stone's "Little White House" The very best of all is of course Elvis singing "And I Love You So".

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## **CHAPTER 1**

### **INTRODUCTION**

At the start of each of the past twenty-five school years, Illinois has consistently experienced a shortage of certified, or licensed, secondary agriculture instructors (Dittmar, 2017). These teachers are needed to replace instructors leaving the profession. Although this shortage could be attributed to several factors, two of those factors can easily be identified. The first would be the retention of current teachers, which have less than five years of experience. The second factor is an insufficient number of qualified agricultural education graduates receiving degrees each year (Dittmar, 2017).

#### **Provisionally Certified Teachers to Fill the Shortage**

The number of unfilled openings created each year has required Illinois schools to hire provisionally, or emergency certified instructors. Unfortunately, some schools are forced to close their high school agriculture programs when they can't find certified or provisional instructors. Over the past 25 years, Illinois high schools hired 246 provisionally certified high school agriculture instructors, which translates into an average of 9.8 per year. Over the past five years Illinois schools have hired 356 teachers and 105 of those were provisional instructors; so that translates into 29.5%. From the 2013-14 school year until the 2017-18 school year, Illinois schools have hired an average of 21 provisionally certified teachers each year (Dittmar, 2017). Almost one in three of our new teachers have not received training to teach in an agriculture classroom, which could further compound the retention of the untrained teachers.

Over the past twenty-five years, our universities' agricultural education departments in Illinois have graduated 624 students certified to teach high school agriculture. However, only 367 newly graduated instructors expressed the desire to teach and applied for jobs as high school

agriculture teachers. Over the past twenty-five years our universities in Illinois have produced an average of 25 licensed student teachers each year, of which only 14.7 sought a career in teaching. Over the same twenty-five years, there have been 1,398 openings in Illinois high schools, which translates to 55.9 each year (Dittmar, 2017).

In a nationwide study, the consistency between Illinois and the United States continued as pertaining to the hiring of provisional teachers. The number of provisionally certified teachers hired in the United States in 2009 was 390, or 44% of the total hires. In 2009, Illinois hired 18 provisional teachers or 31% of the total hires (Kantrovich, 2010).

### **Agricultural Education Graduates Who Choose Other Careers**

In many ways, the shortage of agriculture teachers in Illinois mirrors the conditions across the United States. Data contained within the 36<sup>th</sup> Volume of a National Study of the Supply and Demand for Teachers of Agricultural Education published in 2010 seems to reflect a similar shortage across the United States. In the nationwide survey, it was reported that 44% of the hires nationwide were emergency, or provisional certifications. The study also reported that 31% of agricultural education graduates earning their certification decided not to be teachers before applying for their first teaching job (Kantrovich, 2010).

When considering the career placement data, the national data is similar to Illinois. Sixty-two percent of agricultural education graduates in the United States (Figure 1) accepted employment in high school agricultural education programs (Kantrovich, 2010). In Illinois, the total percentage of graduates choosing to accept a teaching position was 58% for those seeking careers as agriculture teachers (Dittmar, 2016).

### **Retention of Agricultural Education Teachers**

A major issue causing the nationwide shortage was retention of teachers. Due to several factors, over 50% of the beginning teachers leave the profession by their fifth year of teaching (Kantrovich, 2010). In a nationwide study, Osborne (1992) found that the agricultural education profession “literally devours its young” due to heavy workload, high stress level, and excessive job expectations that eventually force agriculture teachers to leave the profession.

### **Evaluating the Quality of a High School Agriculture Program**

There were many ways the quality of a high school agriculture program could have been measured. Some may have measured quality by the number of students in the program. Others may measure the quality by the number of FFA awards the school wins. Unfortunately, those would only give a partial picture of the quality of the school’s agriculture program. This study employed the Illinois Incentive Funding Grant X-score to measure the quality of high school agriculture programs. The Illinois State Board of Education began the Incentive Funding Grant in fiscal year 1989 and continues to collect data through that program. In fiscal year 2018 the grant application consisted of 179 Quality Indicators that schools either met or failed to meet. Based on the number of Quality Indicators achieved, the school earned their X-score. The quality indicators on the Incentive Funding Grant Application were broken into the following categories: qualified teachers; student services; instructional program; Supervised Agriculture Experience; FFA; facilities, equipment, and supplies; advisory committee; and K-Adult Agricultural Awareness Programs (Dittmar, 2016).

### **Statement of the Problem**

Each year, Illinois high schools fail to have an ample supply of licensed secondary agriculture teachers to fill openings. Many of the openings are created by retirement, while other openings

are due to teachers leaving the profession for other careers. Before the start of the 2017-2018 school year, Illinois had 75 openings for high school agriculture teachers. Twenty-four, or thirty-two percent, of the openings were filled by individuals with provisional licenses (Dittmar, 2017).

### **Purpose of the Study**

The purpose of this study was to evaluate the impact of the shortage of licensed instructors on the quality of high school agriculture programs in Illinois, and to determine whether the hiring of provisional instructors affects the quality of a high school agriculture program. In addition, the research examined other issues that might affect the quality of agriculture programs; such as retention, gender, length of contract, and the school's geographic region.

### **Research Questions**

The purpose of this study was to evaluate the impact the shortage of licensed high school agriculture teachers has on the quality of high school agriculture programs, and to determine whether the hiring of provisional instructors influences the quality of a high school agriculture program.

The following research questions were addressed in this study:

- 1. What impact does the type of license a high school agriculture teacher possess have on the quality of a high school agriculture program?*
- 2. Which of the quality indicators in the Illinois Incentive Funding Grant (IFG) application are the most strongly correlated to a high quality secondary agricultural education program, as indicated by a high X-score on the IFG application?*
- 3. What influences does gender, retention within the district, geographic region, and length of a contract have on the quality of a high school agriculture program?*

### **Significance of the Problem**

The number of agricultural education graduates from universities in Illinois have consistently fallen short of the number of openings each year. Over the past five years there have been 277 openings at the beginning of the school years for agriculture teachers within Illinois high schools. Illinois universities have only produced 105 graduates to fill the 277 openings (Novotney, 2015). Furthermore, of that 105 only 67 decided to teach, and applied for teaching jobs. According to numbers provided by the Illinois State Board of Education from 1992 to 2016, only 57% of those receiving agricultural education degrees and certification from Illinois universities have chosen to teach. Data indicates those with a degree in agricultural education will often select careers within the industry of agriculture rather than teach (Novotney, 2015).

### **Limitations of the Study**

Since the data in the Incentive Funding Grant Application will be limited to Illinois, it cannot be able to be generalized to other areas in the United States. Although the data were collected each year since 1988, there were some revisions and changes made to the quality indicators over the years.

### **Definition of Terms**

*Secondary teachers:* instructors teaching at the high school level.

*Licensed:* a certification to teach, which is given to college graduates who have completed university coursework and passed required testing by the state.

*Internship:* an educational experience referred to as student teaching (Phipps, 2008).

*Attrition:* a reduction or decrease in the numbers, size, or strength.

*Preservice*: agricultural education students prior to graduation, including those who are student teaching (Phipps, 2008).

*Retention*: the keeping of instructors within the profession of secondary agricultural education (Phipps, 2008).

*Provisional*: temporary licensure granted to teachers that have not completed state requirements to be a certified or licensed teacher (Phipps, 2008).

*Agricultural Education*: the systematic instruction in agriculture and natural resources at the elementary, middle school, secondary, postsecondary, or adult level (Phipps, 2008).

*Agricultural Educator*: a person teaching agriculture and natural resources in formal and informal settings (Phipps, 2008).

*Career Development Events*: competitive activities that allow students to apply classroom knowledge in the areas of critical thinking, decision making, and problem-solving skills (Phipps, 2008).

*Experiential learning*: an experience-based approach to learning that tests newly acquired knowledge through subsequent performance (Phipps, 2008).

*FFA advisor*: generally, the high school agriculture teacher where the chapter is housed; this individual supervises all FFA activities (Phipps, 2008).

*SAE*: a supervised agriculture experience program (Phipps, 2008).

*Self-Efficacy*: people's beliefs about their capabilities to perform in a classroom (Phipps, 2008).

## **CHAPTER 2**

### **REVIEW OF LITERATURE**

#### **Introduction**

Over the five-year period, between 2011 to 2015 the demand for licensed high school agriculture teachers exceeded the supply of new graduates from Illinois universities by an average of 28 openings per year (Novotney, 2015). While the shortage of teachers existed, agricultural education programs at the high school level in Illinois were growing in numbers. Over the same five-year period, on average, five new programs were created each year (Novotney, 2015) in high schools across Illinois. When we do not have enough graduates from our Illinois universities, we are forced to hire out of state graduates, alternatively licensed/provisional teachers, or close the programs. In extreme cases the lack of qualified instructors prevented some high schools from creating a new program or expanding to a second or third teacher within their existing programs.

The Illinois State Board of Education has implemented several programs to recruit more high school and college students into the area of agricultural education. The Growing Agriculture Science Teachers (GAST) Grant provides funding for colleges and universities to conduct programs that recruit and retain quality students into the agricultural education profession. A couple examples of the GAST grants were payments to college students for internships or student teaching. Another program sponsored by the Illinois State Board of Education is the ELITE Conference. The ELITE Conference is designed to provide high school students with hands-on experience in teaching institutions, and through round table discussions with experienced high school agriculture teachers. The Illinois State Board of Education through the Facilitating Coordination in Agricultural Education Program advisors, provides \$1,000

scholarships to university students in Illinois who student teach and accept an agriculture teaching position in Illinois (Novotney, 2015).

Statistics and data on agriculture educator supply and demand have been collected and studied at the national level since 1921. Current studies conducted on the national level indicate the teacher shortage faced in Illinois is very similar to the national trends. In 1965 The 1<sup>st</sup> Volume of a National Study of the Supply and Demand for Teachers of Agricultural Education was published. The 36<sup>th</sup> Volume of a National Study of the Supply and Demand for Teachers of Agricultural Education 2006-2009 was published in 2010. According to the results of the study released in 2010, 870 replacement teachers were needed (Table 1). Of the 649 licensed graduates produced by universities across the country, 457 graduates accepted positions teaching high school agriculture (Kantrovich, 2010). Three hundred and ninety of the agriculture teachers hired in the United States in 2010 were using provisional or emergency certifications (Table 1). These statistics demonstrate that in a year when graduates who were choosing to teach was at the level of 71%, we were still forced to hire 390 or 44% of the instructors with an emergency or provisional certification. The national study was conducted again in 2014. According to the 2014 study, 717 new teachers were licensed to teach in the United States; however only 499 chose to accept teaching positions (Lawver and Smith, 2014). In 2016, the most recent national study stated 772 university students received a teaching license, and of those 405 chose to accept a teaching position (Lawver and Foster, 2014).

Table 1.

## Nationwide Teaching Positions in US (Kantrovich, 2010)

	1975	1980	1985	1990	1995	1998	2001	2006	2009
Total positions on Sept. 1	12,107	12,510	11,687	10,355.5	10,164	10,706	11,189	10,846.5	10,600
Replacements Needed	1,273	824	1,043	979	977	888.9	1,170.5	1218	869.7
Moving between schools	*	*	238	351	280	314	372	394	202.5
Net demand for replacements	*	*	805	628	697	574.9	798.5	824	667.2
Needed, but not available Sept. 1	211	117	8	23	40	69.5	67.0	78	30
Teachers with Emergency Certification	607	454	140	110	119	175.5	242.0	185	390
Departments that will not operate due to lack of qualified teacher	78	55	3	9	41	55	35	40	21

\* Data not collected for year indicated

### Reducing Attrition of Existing Instructors

With the number of college graduates failing to meet the need of replacements, finding ways to retain teachers was a priority.

### Family Commitments

In a study conducted in Georgia by Tippens, Ricketts, Morgan, Navarro, and Flanders, (2013), it was determined that teachers are most likely to leave for retirement, family, and commitment to children. Forty percent of teachers leaving the profession in 2013 were from retirement or early retirement. Eighteen percent were of teachers leaving the profession due to children and family commitments (Tippens, Ricketts, Morgan, Navarro, & Flanders, 2013). It was determined by the study that females were more likely to retire early at 25 years of experience. Job satisfaction was central to a teacher's decision to leave the profession. A

teacher's job satisfaction is impacted by compensation, working conditions, family and employment conditions. A poor job satisfaction will lead to attrition.

### **Workload**

In another study conducted in Georgia, the focus was on the number of hours worked by agriculture teachers and the balance of career and family life (Murray, Flowers, Croom, & Wilson, 2011). It was determined by the study that Georgia's agriculture teachers work 57 hours per week and 39 days during the summer months. One-third of the respondents said it was always difficult or impossible to balance career and family. Osborne (1992) noted that the agricultural education profession "literally devours its young" (p.3). In this study the researchers believed that female teachers were feeling more of a struggle to balance their careers and family than were males. The study recommended that new teachers with families be placed with experienced mentors. Murray, Flowers, Croom, and Wilson, (2011) suggested that more half-time positions for agriculture teachers could provide options other than completely leaving the teaching profession.

### **Educators Reasons for Remaining in Teaching Career**

Since attrition among agriculture educators is around 50%, within their first six years of teaching, a study by Clark, Kelsey, and Brown (2014) took an interesting approach. Clark, Kelsey, and Brown (2014) explored the reasons why agriculture educators remain in the profession past the age of retirement eligibility. Four themes emerged from the study. The first theme was career teachers experience a transformative shift in mid-career, leading to career sustainability. The second was career teachers receive a great deal of support from students, parents, administrators, and the community. The third reason teachers stayed was they

maintained a balance between work and personal life. The final theme was career teachers reduced their workload later in life to coincide with aging (Clark, Kelsey, & Brown 2014).

### **Educators Reasons for Leaving a Career in Teaching**

Lemons, Brashears, Burriss, Myers, and Price, (2015) conducted a qualitative case study to directly ask the “leavers” of the profession of agricultural education why they left. After conducting interviews with teachers leaving their positions, they cited the following five themes emerging from the case study 1) passion for the profession, 2) alternative opportunities, 3) expectations, 4) burdens, and 5) people.

#### ***Passion for the Profession***

The first theme was their passion for the profession. Although it seemed odd, all of those interviewed were still passionate about their love for agriculture and students. Students were their primary reason for teaching high school agriculture. Under the theme of passion, competition seemed to be a re-occurring sub-theme. Most of the participants spoke of their participation in FFA competitions, as students, as one of the reasons they became teachers. To a lesser note a concern was expressed that overemphasis among teachers on winning was a subtle concern at times.

#### ***Alternative Opportunities***

The second theme was alternative opportunities for the agriculture teacher’s outside of agricultural education. Some agriculture teachers accept positions in school administration, while other agriculture teachers will leave teaching to accept jobs within the industry of agriculture. Most of the alternative jobs pay more or require fewer hours, or both. The third theme was the teacher’s expectations.

### ***Expectations***

The third theme of expectations was divided into self-expectations and expectations of others. The teacher's self-expectations of their jobs in many cases didn't match the actual job. The teachers in the study commented that teachers need to have a better understanding of the job, and the expectations of others, which include parents of students, students, and school officials.

### ***Burdens***

The fourth theme was burdens and responsibilities. If you are a high school agriculture teacher, in addition to your classroom, you may have shops, greenhouses, school farms, and fundraisers. Some of these responsibilities such as school farms and other facilities will be a year-round responsibility. The fact that you don't get Sunday's off might frustrate some teachers from continuing to teach.

### ***People***

The final theme in the study was people. Problems with other teachers, administrators, parents, or community members frustrated teachers from staying in the agriculture classroom. The participants also spoke positively about people within their programs. They believed their fellow agriculture teachers, in some cases, were their best friends.

Lemons, Brashears, Burris, Myers, and Price (2015) believed the result of the study demonstrated attrition is a complex event. Attrition is not always due to one event, but it is caused by a combination of the themes presented in the study. None of the teachers in this case study were asked to leave or were fired by the district. All of the instructors in the study had selected to accept alternative employment. Concern for the quantity of high quality agriculture teachers stretches back much further than the past 5 years. The shortage of agriculture teachers was a consistent problem for at least the last four decades (Kantrovich, 2010). As Ingersoll and

Smith (2003), stated the more significant piece of the puzzle for the teacher shortage was attrition.

### **Work-Life Balance**

Sorensen and McKim (2014) conducted a study in Oregon to determine if work-life balance ability, job satisfaction, and professional commitments were related to each other. They thought if an instructor had a poor work-life balance they would also have a low job satisfaction, which might cause their professional commitment to suffer and lead to attrition. The results of their study indicated that most of the instructors participating in the study were perceived as having moderately high levels of job satisfaction, moderate levels of work-life balance, and that their professional commitment was also at a high level. With high marks in all three concerning factors, the researchers were puzzled that there was still a high level of attrition occurring. They recommended that further studies be conducted to investigate whether life role changes forced teachers to leave their positions teaching agriculture. The results of this study demonstrated that demographics such as male and female made no difference in job satisfaction, work-life balance, and professional commitments. Crutchfield, Ritz, and Burris (2013) conducted a study focusing on why teachers remain in the profession. The study recommended that agricultural education professional organizations should lead an effort to provide inservice and professional development on work-life balance.

### **Self-Efficacy**

Rocca and Washburn (2006) conducted a study on teacher efficacy among traditionally certified and alternatively certified beginning teachers in Florida. The researchers determined that in 2002 Florida graduated 11 certified teachers to fill 41 openings. When school began in 2002, over half of the new instructors were alternatively certified. The results of the study

showed that there was no difference in how effective the teachers felt they were. It did not matter whether they were certified or alternatively certified. A difference did exist in age. The alternatively certified teachers were an average of 10 years older. Many of the alternatively certified teachers were choosing agricultural education as a second career. The race of the teachers also varied greatly between the alternatively certified and the traditionally certified. Of the 27 traditionally certified teachers 26 (96%) were white and 1 was Hispanic. The alternatively certified instructors were 5% black, 80% white, 10% Hispanic, and 5% other. The level of education also varied greatly, as the alternatively certified instructors had possessed more advanced degrees. Of the traditional teachers, 85% had a Bachelor's, while 15% had a Master's. The alternatively certified teachers had 72% Bachelor's, and 28% master's degrees or higher (Rocca & Washburn, 2006).

McKim and Velez (2015) conducted a study on the relationship of career commitment and self-efficacy within early career agriculture teachers. The results of the study indicated that the experience teacher's gain in their first five years of teaching has little impact on their self-efficacy. As a result, the teachers need remedial efforts in years one through five to increase career commitment. The results indicated that classroom management efficacy and science teaching efficacy are very important in years one through five to prevent attrition.

As many researchers conduct studies on a novice teacher's self-efficacy, Langley, Martin, and Kitchel (2014) examined novice teachers for culture shock and social connectedness in Missouri. If a novice teacher from a small rural community was placed in a large urban school district, they have suffered culture shock. The novice instructors may have a hard time connecting and belonging to groups within their new school district's community. The researchers pointed out

the novice instructors could be placed in schools distinctly different than the high school from which they graduated.

### **Burnout**

Studies conducted on burnout could explain the causes of teachers leaving the agriculture classroom prematurely. Kitchel, Smith, Henry, Robinson, Lawver, Park, and Schell (2012) conducted a study of teacher's job satisfaction and burnout. The study found the agriculture teachers from the six states the study was conducted in had a low level of burnout according to the Maslach Burnout Inventory for Educators. The teachers in the study suffered a low level of burnout related to personal accomplishment, and a moderate level burnout due to emotional exhaustion.

### **Newly Licensed Graduates Choosing to Teach**

One of the fundamental challenges faced by high schools in Illinois is hiring teachers to fill openings created through attrition. The traditional method of filling job openings for high school agriculture teachers is to hire college graduates normally produced by universities in Illinois. It seems each year the number of people earning a license to teach is lower than the number of teachers leaving. Furthermore, each year a percentage of those graduates receiving degrees and a license to teach chose not to teach. During the 2015-2016 school year, 13 of 18 graduates of Illinois universities accepted positions to teach high school agriculture in Illinois (Dittmar, 2015). Almost 30% of the people that received licenses to teach in 2016 decided they were no longer interested in teaching agriculture. Over the past twenty-five years, 595 students received degrees and certification to teach high school agriculture. Three hundred and forty-one, or 57% of the total degree recipients, took positions and taught agriculture in Illinois (Dittmar, 2015). When over 40% of the college graduates receiving degrees and a license to teach decide not to

pursue a career in teaching, we should consider the reasons why graduates decided not to teach as one of the solutions to our shortage of qualified instructors. The number of Illinois graduates choosing to teach reflected the numbers nationwide. In the nationwide study done by Kantrovich, sixty two percent of agriculture education graduates chose to teach high school agriculture. (Figure 1)

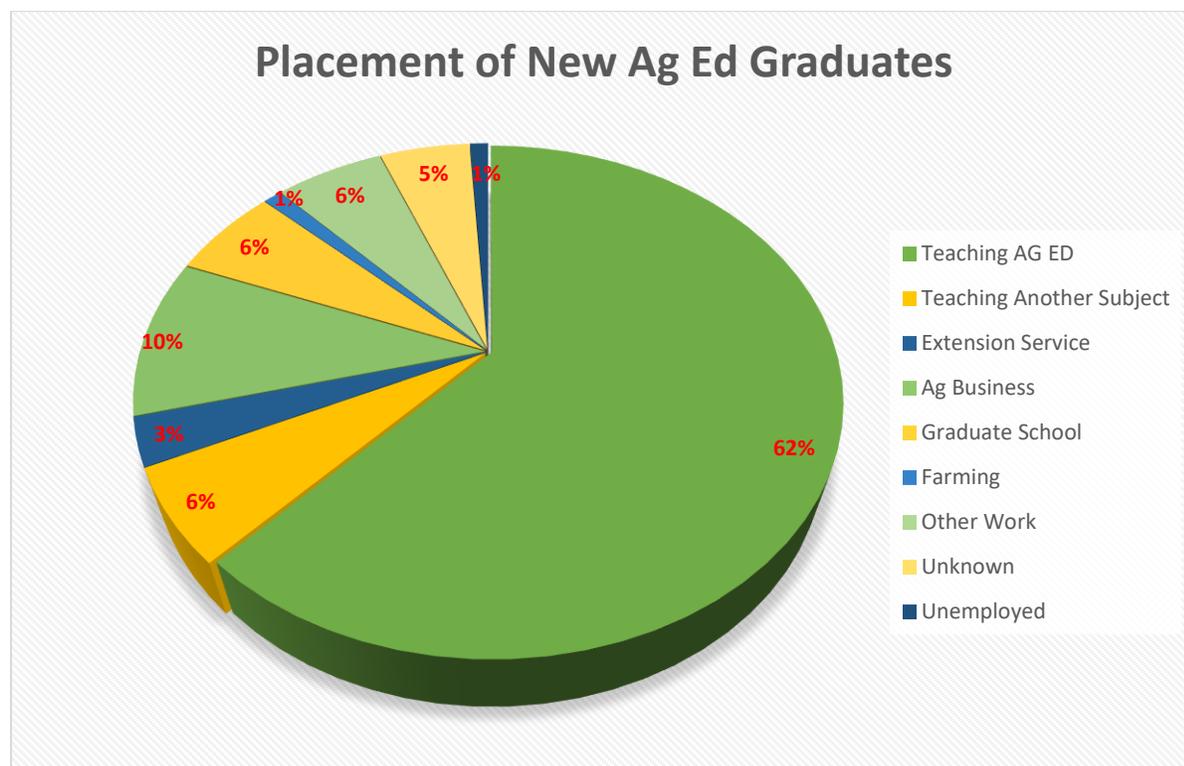


Figure 1. Placement of New Ag Ed Graduates in 2009 (Kantrovich, 2010)

### **Pedagogical & Content Knowledge**

Rice and Kitchel (2015) considered whether preservice teachers were given enough content knowledge of agriculture before being sent to student teach. The researchers created the abbreviation PCK from the words pedagogical content knowledge. The researchers found that the preservice teachers in Missouri were generally dissatisfied with the majority of agriculture content courses they took in terms of quality and quantity. This dissatisfaction could lead to a preservice teacher not choosing to teach or leaving the profession after teaching only a short

time. Most agriculture teachers believe novice teachers would not be effective without agriculture content knowledge (Edwards & Thompson, 2010).

Stripling, Thoron, & Estep (2014) conducted a study of Florida student teachers to describe their preservice teacher's self-perception of their levels of technical knowledge during student teaching. The student teachers felt they did not have enough content knowledge in the areas of ag mechanics, biotechnology, wildlife and fisheries management. The researchers did note that the student teachers used student centered activities with the greatest frequency, and they did not rely on only one type of learning activity a majority of the time.

### **Influences During Student Teaching**

#### ***Cooperating Teachers***

Harlin, Edwards, & Briers (2002) conducted a comparison study of what student teachers thought was important before and after student teaching. The results of the study indicated the most important element of student teaching was the cooperating teacher. Special efforts must be made to place student teachers with exceptional supervising teachers. Deeds & Barrick (1986) determined that the behaviors of the cooperating teachers and the quality of their high school's agriculture program impacted the student's attitudes and morale towards entering the teaching profession.

#### ***Technology-Based Communication***

Paulsen, Anderson, & Tweeten (2015) conducted a study on incorporating Twitter-based technology into the student teaching experience. The study was conducted with Iowa State University's preservice teachers. The study concluded that preservice teachers were willing to communicate their concerns using tools such as Twitter. Questions about content knowledge can

be answered by the group members quickly and effectively. The Twitter-based groups supported the preservice and novice teachers, (Paulsen, Anderson, & Tweeten, 2015).

### ***Monitor Decision to Teach During Student Teaching***

Each year potential teachers decide they don't want to teach during their student teaching experience. Roberts, Greiman, Murphy, Ricketts, Harlen, & Briers (2009) conducted a study to measure the changes of student teachers'

intention to teach during their student teaching experience. The intentions of 102 student teachers from four universities during the 2005-2006 school year were measured. The study asked the student teachers at the beginning and the ending of their student teaching experience if they planned to teach. There was a seven percent decline from the number of student teachers that said "yes" at the beginning to "no" at the end of student teaching. The study recommended that efforts be made to monitor student teachers early in their experience to determine when the decision not to teach is typically made.

### ***Agricultural Mechanics Skills***

The preparation of agriculture teachers includes a wide variety of curriculums. In Wells, Perry, Anderson, Shultz, and Paulsen (2013) study, the researchers examined the effect of pre-service agricultural education teacher's intentions to enroll in post-secondary agriculture mechanics coursework. With the apparent need for agricultural education teachers having agriculture mechanics experience, a concern surfaced that not enough student teachers were studying agriculture mechanics in their coursework. The study went further to express a concern with the anticipation of teacher retirements in Iowa. The primarily male teachers skilled in the area of agriculture mechanics would need replacements skilled in agriculture mechanics. The

researchers recommended that more agriculture mechanics courses be offered at postsecondary institutions (Paulsen, Anderson, & Tweeten, 2015).

### ***Phases Experienced by Beginning Teachers***

Tweeten, Paulsen, & Anderson (2013) examined the phases of the beginning teacher's development. The researchers identified five phases. The phases were anticipation, survival, disillusionment, rejuvenation, and reflection. The researchers asserted both a first-year teacher and a student teacher go through these phases. Anticipation goes from week zero to two. Survival typically goes from week three through five. Disillusionment occurred in weeks six through nine. Rejuvenation occurs week ten through twelve. The final phase was reflection from week thirteen through fourteen. Understanding what phases teachers go through has beneficial applications for mentoring programs.

### ***Career Barriers & Support***

Rocca & Washburn (2008) examined the career barriers and the support for preservice agriculture teachers. The study attempted to determine if gender differences existed. Two hundred and fifteen preservice teachers were surveyed from 35 colleges. Participants were primarily Caucasian, and they grew up in rural areas. Participants felt the career barriers were low and the career support high. The primary career barriers perceived by participants were family responsibilities and unwillingness to move. The student teachers perceived high levels of support from teacher educators, agriculture teachers, and cooperating teachers. The study indicated no practical differences existed between perceived barriers and support for female and male participants.

### **Recruitment into Postsecondary Agricultural Education Programs**

Postsecondary institution's recruitment efforts to increase the number high school students enrolled in university agricultural education programs was yet another area of focus in the effort to reduce the secondary agriculture teacher shortage. A great deal of research and initiatives have been created in recent years to focus upon improving recruitment (Theiman, Rosch, and Suarez, 2016).

#### ***Influences on Career Decision-making at High School Level***

To effectively recruit students into university agricultural education programs, the universities need to know what makes a high school student decide to enroll in university agricultural education programs. Theiman, Rosch, and Suarez (2016) conducted a study that considered when and why high school students decide to select a career in agricultural education. Their study was financially supported by Facilitating Coordination of Agricultural education (FCAE). FCAE was a group of program advisors working through the Illinois State Board of Education. The study found that the most important factors encouraging students to select a career in agricultural education were their parental support of the decision and their perceptions of their high school agriculture teacher. The results of the study showed students usually decided when they were sophomores what career path they would pursue. Interestingly, if the decision was made during their junior or senior years of high school, boys were much less likely to decide to pursue agricultural education than girls.

#### ***University Recruitment Issues***

Calvin & Pense (2013) conducted a qualitative study through the use of group interviews to investigate the problems in recruiting students into teacher preparation programs. The study was based on the assumption that recruitment of quality students into the field of agricultural

education was necessary to reduce the shortage of instructors. The researchers identified five themes related to recruiting issues: time, the economy, family, technology, and image.

### ***Time***

The first barrier to get students into agricultural education was the amount of time they saw their teachers work. The students did not want to work a job that requires 50 or 60 hours of work per week. The teachers in the study had a perception that it took more time to get a degree in agricultural education, than required to get other degrees in agriculture. The extra time was deemed as necessary required to meet requirements to gain teacher certification.

### ***Economy***

The economy impacts school budgets. When students see schools cutting back on programs, they may decide not to get a degree in education. Although salary was not listed as a theme, it was mentioned. The discussion on salary was diverted to the state of Illinois pension crisis for teachers. Teachers felt the crisis with pensions would make it harder for them to encourage students to pursue a degree in agricultural education. They further indicated that school counselors would advise students towards more lucrative fields. The 23 teachers included in the study made it clear that the economic conditions sent a very negative message to students, making it more difficult to recruit quality students.

### ***Family***

The family was also one of the five themes. Interestingly, one teacher pointed out that the parents want the university to treat their child as if he or she was part of their family. They further indicated that parents wanted more interaction with professors and students within the college of agriculture.

### *Technology*

The teachers cited technology as another theme. The high school instructors thought the university could use more technology to recruit students. The teachers suggested using facebook to attract potential students.

### *Image*

Parents can have a negative impact on a student's choice of a major in agriculture. Osborne & Dyer (2000), described the attitude of parents and students towards agriculture and agricultural education. The results of the study indicated 90% of the parents and students perceived the science applications in agriculture courses to be excellent or good quality. The parents expressed a view classified as uncertain toward educational programs in agriculture. Agriculture teachers vary on their experience with supervised agriculture experience programs. Supervised agriculture experience programs were traditionally called "record books." Due to a concern that preservice teachers were not given enough instruction on supervised agriculture experience programs at the postsecondary level, Rubenstein, Thoron, and & Estep (2014) conducted a study to measure self-efficacy of student teachers toward record books. The results of their study indicated 95% of the student teachers considered SAE competencies important to somewhat important. Student teachers that had record book experience in high school versus student teachers with no experience in record books showed little difference in their self-efficacy with record book competencies.

Kendra Flood and Christian Stanley wrote an article that was published in the Agricultural Education Magazine (Stanley & Flood, 2017) concerning the shortage of agriculture teachers and methods to increase the number of agriculture education students in our universities. Flood and Stanley proposed three methods of increasing the number of agriculture education students. The

first proposal was to encourage the universities to provide financial support and a first-year mentorship class through the sponsorship of their host universities. Their second proposal was for Alpha Tau Alpha chapters to host high school conferences for high school students interested in a career in agricultural education. Their third proposal was for the Alpha Tau Alpha chapters to launch a social media campaign to encourage high school students to consider being an agriculture instructor.

### **Measuring the Quality of Agricultural Education Programs**

The measurement of quality within a high school agriculture program was very difficult and often very subjective. One objective way to compare or measure the quality of programs in Illinois was the Agricultural Education Incentive Funding Grant (Hepner, 2017). In 1986, the Illinois General Assembly passed Public Act 84-1452, which was an effort to improve and update agricultural education in Illinois. To support this effort, they appropriated funds to benefit agricultural education programs from Pre-K to adults. With the help and advice from the Illinois Committee for Agricultural Education, the Illinois Association of Vocational Agriculture Teachers, and the Illinois State Board of Education, funds were allocated based upon the objectives of the Illinois Plan for Agricultural Education and Illinois First Through Quality Agricultural Education: A Strategic Plan for Illinois Agricultural Education (Hepner, 2017).

The allocation supported local high school program improvement, curriculum development, teacher in-service, pilot projects, and other important initiatives. All local high schools in Illinois offering approvable programs in agricultural education at the secondary level were eligible to apply for incentive grants. Detailed data ranging from the year 2002 to 2017 was posted on the Illinois Agricultural Education website. Each school earned a score based upon the number of quality indicators, or X, they earn throughout the school year. The quality indicators were

updated and reviewed each year. The categories for the 2018 Quality Indicators and their potential X values were as follows: qualified teachers (25), student services (5), instructional programs (28), SAE (15), FFA (26), facilities and equipment (8), agriculture advisory council (8), and K-adult programs (6). The total number a school could earn was 121 x in Fiscal Year 2018 (Hepner, 2017).

The teacher or teachers completed the initial parts of the application for the Incentive Funding Grant online by completing a checklist within each of the categories listed above. The Illinois FFA Office and the Facilitating Coordination in Agriculture Education Field Advisors both inputted and verified data entered by each school's agriculture instructor. When the process was complete, the application provided the total number of X's earned for each school district based on the quality standards they completed during the previous school year. Depending on the fiscal year, there were 170 to 190 different quality indicators. A summary page of which schools met each of the quality indicators was available on the website, "Illinois Agricultural Education".

Although there have been very few research studies published pertaining to the Illinois Incentive Funding Grant, Baker (2002) conducted a study to evaluate the values of the incentive funding grant application for agriculture education in Illinois. The study attempted to determine which categories or subheadings within the grant application possessed the most direct correlation with the dollars received by each school. The study did not evaluate the individual quality indicators, but focused on the eight overall categories. Baker used the data from 306 of the 316 high school agriculture programs in Illinois in fiscal year 2002. The subheading with the highest correlation to dollars received was "Agriculture Student Organizations." The second highest category was "Qualified Teachers," and the third was "Instructional Programs."

Bakers' study concluded that if you have a qualified teacher that teaches the correct curriculum and submits a program of activities, you will have success when it comes to incentive funding. Baker (2002) also examined geographical differences in the quality of program and funds received by Illinois schools. The schools with the highest X-score and funding, with an average of \$2,707.73, were in District III, while the lowest were in District II with an average of \$2,259.52.

Baker recommended schools could improve their funding by focusing on two areas. The categories receiving the lowest percentage of achievement or completion were in "Advisory Councils" and "Agriculture Literacy," so schools wanting to increase their funding should focus on those areas.

### **Three-Circle Model of an Agricultural Education Program**

The National Association of Agriculture Educators (NAAE) answered the question "what is an agricultural education program" by using an illustration of three circles that are interconnected. The three circles of an agricultural education program include the components of classroom or laboratory instruction, FFA, and supervised agriculture education. Each component is required to conduct a quality program. Each of the past four years the three-circle model had been printed on the second page of the Illinois Agriculture Education Report published by the Illinois State Board of Education. An illustration of the three-circle model printed in the 2015 Illinois Agricultural Education report was included as Figure 2.

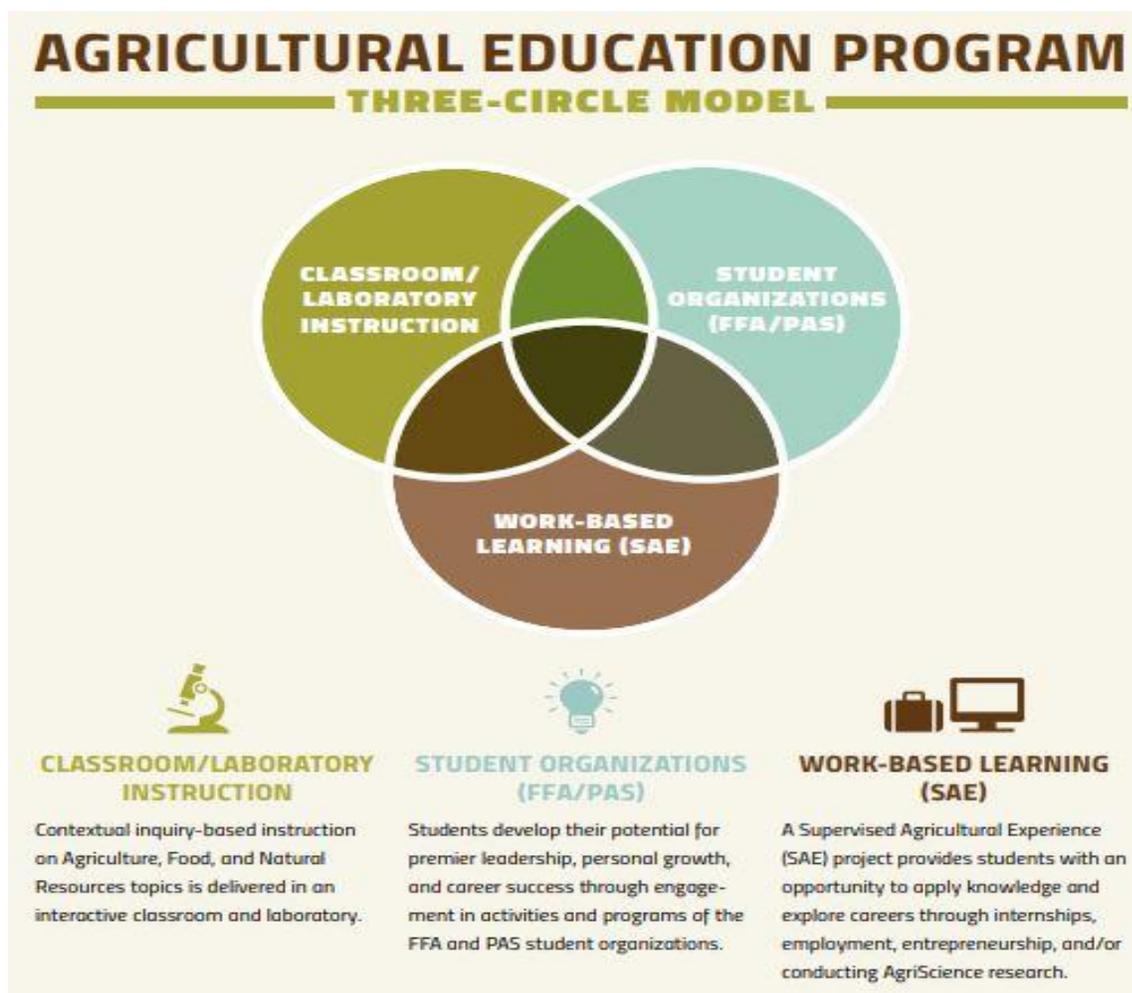


Figure 2. Three-Circle Model of Agricultural Education, (FCAE, 2015)

### Data Mining and It's Theoretical Underpinnings

According to Martin Brown, conditions had never been any better when it came to amounts of data, data collection software, and availability of places to store data. There had been an incredible surge in the amount of data available. Data were stored in many ways including, web access logs, user profiles, data from sensors, summaries, and educational data. The result was massive quantities of data. However, to use the information, one needed to dig through the data, employing “data mining.” According to Brown data mining was a five-step process. The five-step process was as follows: identifying the source information, picking the data points,

extracting the relevant information from the data, identifying the key values from the extracted data set, and interpreting and reporting the results (Brown M. 2014).

The first step was identifying the source of your information. One needed to search and find the different data sets that were available. Different data sets provided different challenges, which have created a variety of issues during collection. The second step of picking the data points was essential. One had to be certain that the data was related to the information desired, and then extract it. Depending on the complexity of the data, the third step of information extraction and the calculation of statistics may be straightforward or complex. The identification of key values was the fourth step. One had to identify valid values and eliminate data that was not valuable to the data set. The final stage required the resolution of information into qualifiable terms; such as direct comparison or group comparisons. He added that data mining was not a simple process. Data might not fit well into organized formats.

Mannila (2000) conducted a study on creating theoretical frameworks for data mining. Mannila contended that data mining was very close, in its nature, to statistics. Data mining was often used as a secondary analysis. Data compression was another goal of data mining. Data mining was about finding actionable patterns. Data mining could also provide a similar purpose to factor analysis. Data mining could unveil previously unseen but preexisting pieces of knowledge.

## **CHAPTER 3**

### **METHODS AND PROCEDURES**

#### **Introduction**

This study aimed to investigate the impact of the shortage of licensed instructors on the quality of high school agriculture programs in Illinois. The researcher used the data from the Incentive Funding Grant (IFG) application submitted by each school in Illinois having a secondary agriculture program. The data was collected from the Illinois Agriculture Education website (FCAE, 2017). Information was also collected from Dean Dittmar, the District V Field Advisor for Facilitating Coordinating Agriculture Education (FCAE).

Chapter 3 provides a detailed description of methods used to collect the data pertaining to the quality of Illinois high school agriculture programs. The target population, instrumentation, permission for research, data collection, treatment, and data analysis were also explained. This longitudinal repeated measure study involved the mining and analysis of existing online data that covered a five-year period from fiscal year 2014 to fiscal year 2018.

#### **Purpose of the Study**

The purpose of this study was to evaluate the impact of the shortage of licensed instructors on the quality of high school agriculture programs in Illinois, and to determine whether the hiring of provisional instructors affected the quality of a high school agriculture program. In addition, the research examined other issues that affected the quality of agriculture programs such as retention, gender, length of contract, and the school's geographic region.

#### **Research Questions**

The following research questions were addressed in this study:

1. *What impact does the type of license a high school agriculture teacher possesses have on the quality of a high school agriculture program?*
2. *Which of the quality indicators in the Illinois Incentive Funding Grant (IFG) application are the most strongly correlated to a high quality secondary agricultural education program, as indicated by a high X-score on the IFG application?*
3. *What influence do gender, retention within the district, geographic region, and length of a contract have on the quality of a high school agriculture program?*

### **Target Population and Sampling Procedure**

The target population of this study was comprised of two groups. The first group included high school agriculture instructors within the state of Illinois over the past five years. During the 2016-2017 school year, there were 403 high school instructors in Illinois. Each instructor's school or program was evaluated by his/her program's attainment of quality indicators, and therefore the terms "Program" and "Teacher" were used interchangeably in this study. The terms school and program were used interchangeably as well. The data that was used in this study already existed within reports produced by the Illinois State Board of Education and archived in an online repository. Fifty-seven percent of Illinois secondary agriculture instructors were men, while 43 percent were women. One hundred and five, or twenty-six percent, of the instructors in Illinois were provisionally certified. Thirty-five percent of Illinois secondary agriculture teachers possessed a master's degree. The agriculture teachers' names, schools, mailing addresses, and email addresses were available through the Illinois Association of Vocational Agriculture Teachers (IAVAT) (Ag Ed Directory, Nov 2017) directory. The directory was updated each year by FCAE. A census sample was employed, accessing data on all teachers

in the geographic designations of the IAVAT; which divided the state of Illinois into twenty-five sections and five districts (Appendix F).

### **Measures**

Each year the Illinois State Board of Education conducted an Incentive Funding Grant for high school agriculture programs in Illinois. The teachers at each high school in Illinois completed a grant application. The grant application collected data on the quality of each district across the state of Illinois. Each district earns a score based on the number of quality indicators they earn. The dependent variable of this study was the number of x's, or quality indicators, earned by each secondary agricultural education program. The independent variables included the teachers level of licensure, selected quality indicators, contract length, geographic region, retention, gender, and degree achieved.

### **Procedure**

Five years (fiscal year 2014-fiscal year 2018) of data were data mined from the online repository for each of the Illinois agricultural education programs' Incentive Funding Grant applications. HTTrack Website Copier (Roche, 2017) was employed for data mining purposes, and the data included the teachers' teaching license type, gender, degree earned, longevity, and each school's quality indicator totals. This was a longitudinal repeated measures study, and means were calculated for each year's X-scores and compared. Comparisons were also conducted to analyze each school's performance. This process was repeated for each of the past five years. The data was stratified into section, district, and state for comparison purposes.

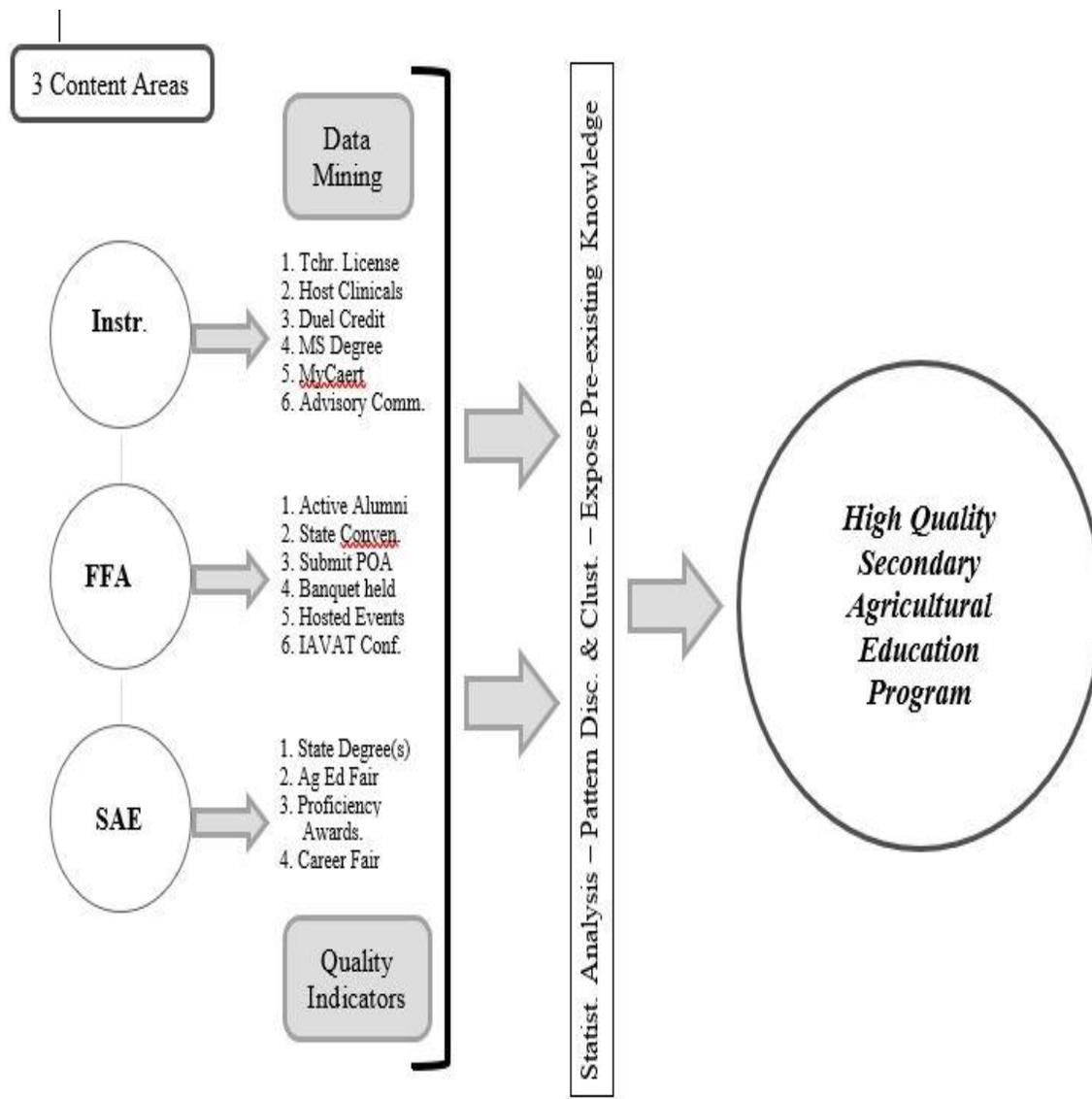


Figure 3. Framework for Assessing the Quality of Illinois Agricultural Education Programs: A Modification of the Inductive Data Mining Theory ( Phipps, etol. 2008; Mannila, 2000)

Figure 3 provided the theoretical framework for this study. Data was collected that provided information relating to the quality of high school agriculture programs. A quality agriculture program has three components which include classroom instruction, FFA, and Supervised Agriculture Experience programs (NAAE, 2017). Data mining collected quality indicator summary reports from the Illinois Agriculture Education website. The summary

reports listed the school's names that completed the quality indicators. After the data was mined, it was analyzed for groupings or patterns, and the characteristics of a high-quality program were more clearly defined.

### **Data Analysis**

SPSS 24 (descriptive and parametric statistics) were used to utilized to analyze the quantitative data collected from the Incentive Funding Grant repository. Spreadsheets were created that contained the descriptive archived data from the Incentive Funding Grant concerning gender, longevity, degree held, quality indicators earned, and type license the instructor held. The data were then analyzed in a longitudinal manner over a period of five years, fiscal year 2014-2018. The number of quality indicators, or X values, earned by each school served as the dependent variable; while the gender, longevity, degree, geographic region, and licensure served as the independent variables. The study stratified data in a manner that provided data for not only the state level, but the section and district as well. Each data group was assigned an average and the averages between the groups were analyzed. Figures, tables, and graphs were used to further illustrate or explain the data. One-sample T-tests were conducted between the groups of independent variables. Clearance to begin analyzing data was granted by the Southern Illinois University Carbondale Human Subjects Committee on February 13, 2018.

### **Instrumentation**

Prior to data mining, total X values for each school were calculated from the total dollar amount for the Incentive Funding Grant award from the Agricultural Education website ([agriculturaleducation.org](http://agriculturaleducation.org)) for the past five years (FY2014-FY2018). This was done because the total number of X-values changed from year to year and by converting to a percentage, this

variation was eliminated, making the data consistent. See X-values on IFG application (Appendix B).

An Illinois State Board of Education (ISBE) consultant provided dollars per X in each year's grant and the X values were manually calculated from the listed dollar amounts and inputted into an excel spreadsheet. A formula was then used to convert the total X into a percentage. This provided a general measure for each school, which would in turn provide a five-year average for each school, as well as an average X-value for each fiscal year; thus, identifying low performing and high performing school districts.

### **Data Mining**

To analyze over 180 quality indicators in the Incentive Funding Grant Application (Appendix B), identifying those more directly related to each instructor, an initial excel spread sheet was constructed to collect data points by collecting weblinks to each of the individual quality indicators archived on the Agricultural Education website. HTTrack Website Copier, a spyder software used for data extraction from online sources (Roche, 2017), was employed to take data consisting of summary sheets (Appendix D) from those sites whose weblinks were downloaded onto the initial Excel spreadsheet (Appendix E). It converted the HTML language and transferred it into Excel in a data form that could be inputted into the Statistical Package for the Social Sciences (SPSS), version 24(Appendix F). A template with formulas was then created to translate the data into a binary form. A single comprehensive formula was developed to convert school names into numbers; thus, recording all data points for each school from the different weblinks on the Agricultural Education website.

## **CHAPTER 4**

### **RESULTS**

This chapter presents the results in both a narrative and a graphic format. After completion of the data analysis, the researcher presented the results in such a way as to address the research questions from the study.

#### **Purpose of the Study**

The purpose of this study was to examine the shortage of licensed high school agriculture teachers in Illinois and its impact on the quality of high school agriculture programs in Illinois. To measure the quality of a program the researcher used the X-scores from each school's Illinois Incentive Funding Grant application from fiscal year 2014 to fiscal year 2018. The X-scores were based on the number of quality indicators each school achieved, with each quality indicator being weighted by varying x-values. The total possible X-scores varied over the years. The maximum X-scores during this study were as follows: fiscal year 2014, 152X; fiscal year 2015, 117X; fiscal year 2016 117X; fiscal year 2017, 117X; and fiscal year 2018, 121X. Consequently, yearly X-scores were normalized to percentages scored within the total possible score for that year, so that percent scores could be compared equally over a five-year period.

#### **Study Design**

A longitudinal repeated measure research design was used to study the impact of the shortage of licensed agriculture teachers on the quality of high school agricultural education programs in Illinois. The population consisted of every high school agriculture program in Illinois from fiscal year 2014 to fiscal year 2018. The number of schools from Illinois included in the study were as follows: fiscal year 2014, 314 schools; fiscal year 2015, 321 schools; fiscal year 2016, 320 schools; fiscal year 2017, 321 schools; and fiscal year 2018, 327 schools.

Data were collected for each year between the 2012-2013 school year (fiscal year 2014) and the 2016-2017 school year (fiscal year 2018). To better understand ISBE's online reporting of each fiscal year quality indicators on the Illinois Agricultural Education; fiscal year 2018 allocation of funding and X-scores were based on the achievement of quality indicators for the previous school year. Data were collected from the applications of each school district that had a high school agriculture program and participated in the Illinois State Board of Education's Incentive Funding Grant program. The researcher used data mining techniques and web spidering software to extract, process, format, and reduce the data from the Illinois Agricultural Education website using HTTrack Website Copier.

After the information was extracted, it was converted from textual format to binary code using Microsoft Excel (Office 365, 2018) templates. The Excel documents were then imported into the IBM Statistical Package for the Social Sciences (SPSS) 24 (2017) and analyzed.

### **Findings According to Research Questions**

The data were reported by each research question:

- 1. What impact does the type of license a high school agriculture teacher possesses have on the quality of a high school agriculture program?*

Research question number 1 required determination of the arithmetic mean quality (as a percentage of the X-score for that year) of every agriculture program in Illinois. The researcher collected the data from each high school's X-scores over a five-year period (fiscal years 2014 – 2018). SPSS was used to calculate the mean X-score. The grand mean X-score over the five-year period from fiscal year 2014 to fiscal year 2018 was 54.2 percent. In the first fiscal year, 2014, the average was 54.1 percent. In fiscal year 2015 the average X-score rose to 55.5 percent. Fiscal

year 2016 and 2017 were close, at 54.3 and 54.1 percent. In fiscal year 2018 the average X-score dropped slightly to 53.1 percent.

As illustrated in Figure 4, there were no significant differences between the fiscal years. Fiscal year 2018 was the lowest year with a mean of 0.53, while fiscal year 2015 was the highest year with a mean of 0.55.

Table 2.

Fiscal Year 2014 to Fiscal Year 2018 Mean X-Scores in Illinois Table 2.

Fiscal Year	N	M	SD	SE
2014	314	0.54	0.19	0.01
2015	321	0.55	0.20	0.01
2016	320	0.54	0.20	0.01
2017	321	0.54	0.20	0.01
2018	327	0.53	0.20	0.02
5 Year Total	1603	0.54	0.20	0.01

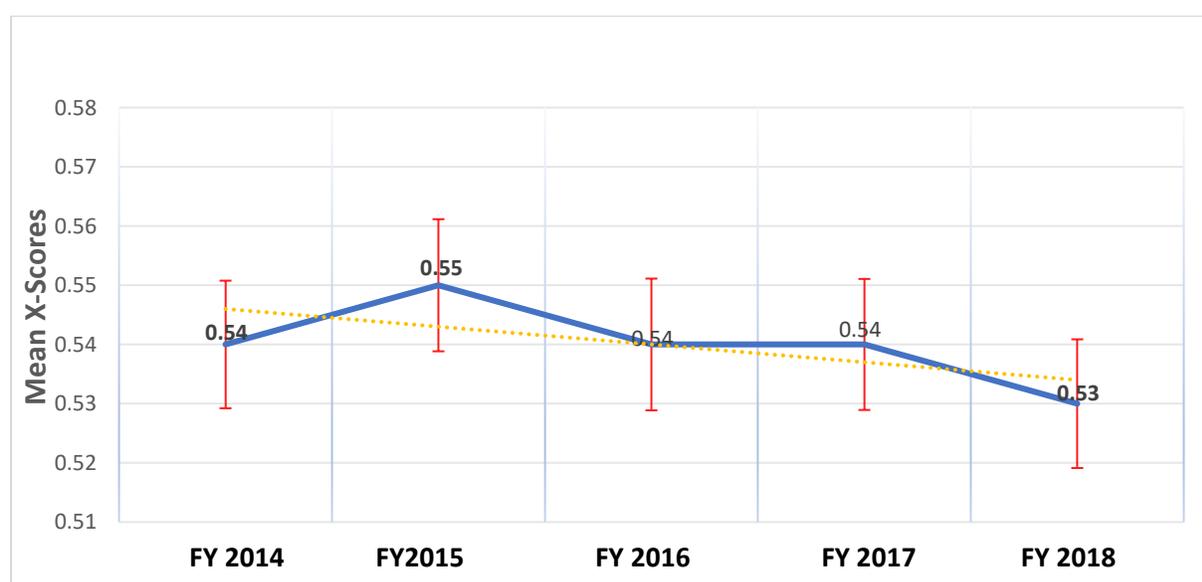


Figure 4. Mean X-Values Achieved by High School Agriculture Programs in Illinois.

After the state averages were calculated for each fiscal year (Table 2), the average X-scores for licensed and provisional instructors were calculated for each of the five fiscal years. For provisional (or licensed with stipulations) teachers, the average over the five-year period was an X-score of 38. percent with a standard deviation of 0.20, and a standard error of the mean of 0.03. The average for licensed instructors was 57 percent with a standard deviation 0.18, and a standard error of the mean (SE) of 0.01 (Table 2).

Table 3.

X-scores for Schools with Provisional or Licensed Teachers from FY14 to FY18

Fiscal Year	Type License	N	M	SD	SE
2014	Provisional	34	0.36	0.18	0.03
2014	Licensed	280	0.56	0.18	0.01
2015	Provisional	44	0.38	0.19	0.03
2015	Licensed	277	0.58	0.18	0.01
2016	Provisional	56	0.37	0.20	0.03
2016	Licensed	264	0.58	0.18	0.01
2017	Provisional	64	0.41	0.20	0.03
2017	Licensed	257	0.57	0.18	0.01
2018	Provisional	69	0.40	0.21	0.03
2018	Licensed	258	0.57	0.18	0.01

Total	Provisional	267	0.38	0.20	0.03
Total	Licensed	1336	0.57	0.18	0.01

Figure 5 demonstrates average X-scores for schools with licensed instructors and schools with provisional instructors. All five fiscal years, the scores were significantly higher for schools with licensed instructors.

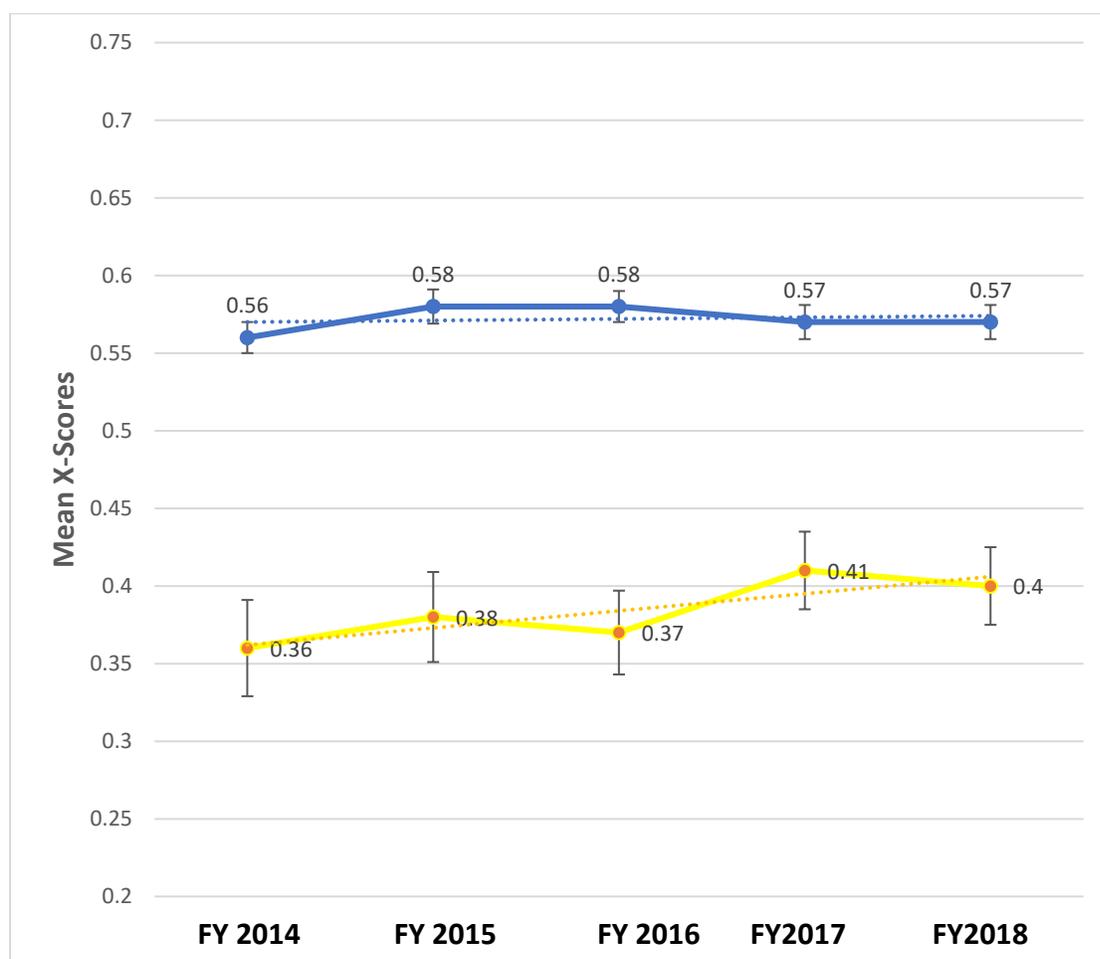


Figure 5. X-scores for Schools with Provisional or Licensed Teachers from FY14 to FY18

Note: Blue line was licensed instructors, and yellow line was provisional.

2. *Which of the quality indicators in the Illinois Incentive funding Grant application are the most strongly correlated to a high quality high school agricultural education program, as indicated by a high X-score on the IFG application?*

The second research question required the researcher to analyze the individual quality indicators that generated the X-scores received by the school each year. The total number of indicators changed in two of the years but stayed the same in three. In fiscal year 2018 there were 179 quality indicators. While in fiscal year 2017, 2016, and 2015, they remained the same at 172 quality indicators. In fiscal year 2014, there were a total of 183 quality indicators.

Out of the 179 quality indicators, the researcher selected twenty-two quality indicators to best represent quality agricultural education programs. The twenty-two quality indicators were selected by using SPSS 24 to run Pearson correlation tests between all 179 of the quality indicators from fiscal year 2018. Quality indicators were selected by ranking on the full list of 179 using the Pearson correlation coefficient, and then further selected to remove multiple collinearity and to reflect expert input on the indicators measurability. Interestingly, correlations of the quality indicators to the mean X-score were almost perfectly correlated (Table 4).

As a final step, SPSS 24 was used again to conduct a factor analysis to further identify the groups of quality indicators which were related or associated with high X-scores. Fifteen quality indicators relating to the following topics were then selected: hosting regional IAVAT or FFA events, attending the IAVAT Conference, participating in the Section Agriculture Education Fair, sending students to career fairs, serving as a student teaching or observations site, offering dual-credit courses, using MyCaert curriculum, participation in FFA career development events, Proficiency Award (SAE) participation above the chapter level, earning state FFA degrees,

submitting FFA program of activities, attending state FFA convention, having an alumni affiliate, conducting a member recognition banquet, and having two or more advisory council meetings.

On the National Association of Agriculture Educator's website, an image of the three-circle model for agricultural education categorized the components of a quality high school agriculture program. Those three components are classroom instruction, FFA, and Supervised Agriculture Experience (SAE) programs. Each of the quality indicators selected related to one or more of those components. ( NAAE, Nov 2017).

While the focus of the study was to identify those factors that most closely correlated with high X-scores, it was clear that some of the quality indicators were more correlated with low scores. As illustrated in Table 4, Provisional instructors had a negative Pearson correlation coefficient of -0.276 (Table 4). Teacher's with a nine-month contract were at a Pearson correlation coefficient of -0.383. Agriculture programs that participated in one or fewer career development events had a negative bivariate correlation of -0.290. Furthermore, if the MyCaert curriculum provided to every Illinois high school agriculture program in Illinois free of charge was only used by the teacher, and not the teacher and the students, it had a negative bivariate correlation of -0.215.

Table 4.

Correlation of Quality Indicators Achievement by Percentage to High IFG Scores

ISBE QI	Quality Indicator Description	Mean %	Pearson r	P Value
A1a	Employed a Licensed Teacher	79	0.35**	0.000

A1b	Employed a Provisional Instructor	26	-0.28**	0.000
A3a	Teacher employed with 9-Month Contract	13	-0.38**	0.000
A3e	Teacher employed with 11-Month Contract	17	0.29**	0.000
A4f	Hosted a Section IAVAT/FFA Event	0.67	0.59**	0.000
A5a	Attended IAVAT Conference	0.68	0.57**	0.000
A6b	Teacher Earned Master's in Ag Ed	0.38	0.18**	0.001
A7c	Hosted Pre-Service Teachers for Clinicals	0.13	0.27**	0.000
B7	Students attended a Career Conference	0.75	0.40**	0.000
C6	Instructor taught Dual-Credit Ag Course	0.28	0.27**	0.000
C9-1	Participated 1 or fewer CDE's	0.09	-0.29**	0.000
C9-6	Participated in 12 or more CDE's	0.22	0.43**	0.000
C10a	MyCaert used by Teacher Only	0.49	-0.22**	0.000
C10b	MyCaert used by both Students and Teacher	0.42	0.35**	0.000
D4b	Submitted 6 or more SAE for Section Judging	0.34	0.64**	0.000
D5	Three or more exhibited in Section Ag Ed Fair	0.42	0.62**	0.000
D6	One or more Earned State FFA Degree	0.53	0.65**	0.000
E3	Submitted POA for National Chapter Award	0.53	0.65**	0.000
E7a	Attended Illinois FFA Convention	0.83	0.60**	0.000
E8	School Supported by Alumni Affiliate	0.63	0.57**	0.000

(Table 4 Continued)

G2	Advisory Council meets 2 or more time per year	0.49	0.53**	0.000
H2c	Conducted FFA Week Activities	0.89	0.31**	0.000

\*\* Pearson Correlation is significant at the 0.01 ( $P < 0.01$ ) level (2-tailed).

A factor analysis was conducted to further reduce the number of input variables and reveal groups of variables called latent factors. Three factor groupings were identified (Table 5). Factor one's eigenvalue of 23.96 was much higher than factor two's eigenvalue of 7.21, and factor three's score of 5.57. All five of factor one's quality indicators scored higher, than any other quality indicator's score in group two or three and thematically clustered around FFA/SAE variables.

Table 5.

#### Factor Analysis Group Totals

Factor	% Variance	Initial Eigenvalues	
		Cumulative %	Total
1 - FFA/SAE	13.85	13.85	23.96
2 - Advisory Meetings	4.17	18.02	7.21
3- FB Ap, FFA Donation	3.22	21.24	5.57

Factor 1 required a teacher to travel to and compete in FFA activities. Participation in FFA career development events was the highest scoring quality indicator with a score of 0.767 (Table 6). The next highest quality indicator was related to Supervised Agriculture Experience (SAE), or record books. The quality indicator required sending one to five SAE's to Section Proficiency

Award Judging. The third quality indicator in group one required the school to attend District Proficiency Award Judging, and the fourth quality indicator required a member to earn the Illinois FFA Degree. The final quality indicator required the high school agriculture program to enter six or more students in the Section Proficiency Award judging.

Table 6.

Factor Analysis of Quality Indicators in Factor 1.

QI Rank	ISBE QI	Factor 1 Quality Indicator Description	EV
1	C9	Participated in Career Development Events	0.77
2	D4	SAE Award participation above chapter level	0.69
3	D4c	SAE participated at district level	0.67
4	D6	Earned 1 or more state FFA degrees	0.66
5	D4b	6+ SAE students participated at Section	0.63

Factor two consisted of quality indicators that dealt with advisory meetings or planning in general. According to Table 7 the highest group 2 eigenvalue of 0.616 was the quality indicator focused on planning curriculum at advisory council meetings. The second highest score was discussing facilities, equipment and supplies during the advisory committee meetings. To earn the third highest quality indicator, a school administrator had to attend the advisory committee meetings. The fourth and fifth quality indicators were granted based on whether a school had one, two, or more advisory council meetings during the fiscal year.

Factor three consisted of participating in Farm Bureau programs, donating to the Illinois FFA Foundation, and participating in a parliamentary procedure Career Development Event (CDE). It

should be noted that the eigenvalues were approximately half as large as the eigenvalues from factor one and two. The Cooperative Activities Program and the Heritage Program are sponsored by the Illinois Farm Bureau. Each year activities are conducted and applications for awards are submitted. The Cooperative Activities Program seemed to be the more strongly correlated of the

Table 7.

Factor Analysis of Quality Indicators in Factor 2.

QI Rank	ISBE QI	Factor 2 Quality Indicator Description	EV
1	G3a	Advisory Council (AC) reviewed curriculum	0.62
2	G3c	AC reviewed facilities and equipment	0.61
3	G4	School administrator attended AC meeting	0.59
4	G2	AC conducted 2 or more meetings	0.58
5	G1	AC conducted at least one meeting	0.58

two programs with an eigenvalue score of 0.410 (Table 8). The fourth highest quality indicator in group 3 required a school to donate 1,500 dollars to the Illinois FFA Foundation. The parliamentary procedure Career Development Event was the fifth highest score for factor 3.

Table 8.

## Factor Analysis of Quality Indicators in Factor 3

QI Rank	ISBE QI	Factor 3 Quality Indicator Description	EV
1	E12	Completed Farm Bureau YEA applications	0.43
2	E12a	Completed FB Coop Activities application	0.41
3	E12b	Completed FB Heritage Program application	0.39
4	E11c	Donated \$1,500+ to IL FFA Foundation	0.30
5	C9s	Participated in parliamentary procedure CDE	0.29

A group of quality indicators relating to the Supervised Agricultural Experience program (SAE) were selected from the results and review of the Pearson Correlation and the factor analysis (Table 9). The first quality indicator selected was earning the Illinois FFA degree. Table 8 illustrates a comparison of the percentage of licensed and provisional instructors achieving that quality indicator. Five-hundred and ninety, (56 percent, n=1056), of licensed instructors had students that achieved the Illinois FFA degree over the past five years. In contrast fifty-seven, or twenty-four percent, of schools with provisional instructors earned the Illinois FFA degree over the same five-year period. The difference in achieving the quality indicator for the Illinois FFA degree for teachers with licenses compared to provisional teachers was thirty-two percent.

The second quality indicator related to SAE was achieved by having at least three members of a school show in the agriculture education fair. Fifty-nine percent of schools with licensed instructors had three or more students show in the fair, while only twenty-five percent of schools

with provisional instructors achieved this quality indicator. The difference between the schools with licensed or provisional instructors was thirty-four percent.

The third quality indicator for SAE was based on students turning in a completed record book for judging. The schools achieving this quality indicator had to turn in six or more record books for judging at the section level. The students were not required to win first place to achieve this quality indicator. Forty-one percent of schools with licensed instructors completed this quality indicator, while only fourteen percent of schools with provisional instructors earned this quality indicator. Schools with licensed instructors earned this quality indicator at a twenty-seven percent higher rate than schools with provisional instructors.

The final quality indicator relating to SAE experience was activities relating to career fairs. The percentage of participation was highest for this quality indicator. The schools with licensed instructors had an 85 percent participation rate and the provisional instructors had a participation rate of 71 percent. The difference between the two was only fourteen percent.

Table 9.

Licensed and Provisional Instructors' Achievement of Quality Indicators Relating to SAE.

Quality Indicator	Licensed		Provisional		% Diff.
	n/N	%	n/N	%	
Earned State Degree	590/1056	56	57/233	24	32
Ag Ed Fair	785/1336	59	67/267	25	34
Proficiency Awards	547/1336	41	38/267	14	27
Attended Career Fair	864/1056	82	153/233	67	15

Note: n/ N = number of teachers (numbers aggregated over five years – duplicated).

As illustrated in Figure 6 participation in career fairs was the highest of all the activities, with licensed teachers at 82 percent and provisional at 67 percent. The lowest was proficiency, which was 41 percent for licensed teachers and provisional teachers were dropped to 14 percent.

The second group of quality indicators selected were related to FFA (Table 9). Six quality indicators were selected. Almost two-thirds of the schools with licensed instructors had active alumni affiliates. A little over one-third of schools with provisional instructors had active alumni affiliates. The Illinois FFA Convention was held each year in June. With over eighty-eight percent of schools with a licensed instructor attending. Schools with provisional instructors participated at a rate of sixty-four percent. The next quality indicator required a school to develop a Program of Activities (POA) and submit an application to the Illinois FFA for the National Chapter Award Program. Sixty-Seven percent of schools with licensed instructors completed this quality indicator, while fifty-two percent of schools with provisional instructors completed their applications. The quality indicator that encouraged a school to hold a parent member banquet had the highest percent of participation. Seventy percent of schools with provisional instructors conducted a FFA banquet, and eighty-eight percent of schools with licensed teachers. There was an eighteen percent difference between the two groups.

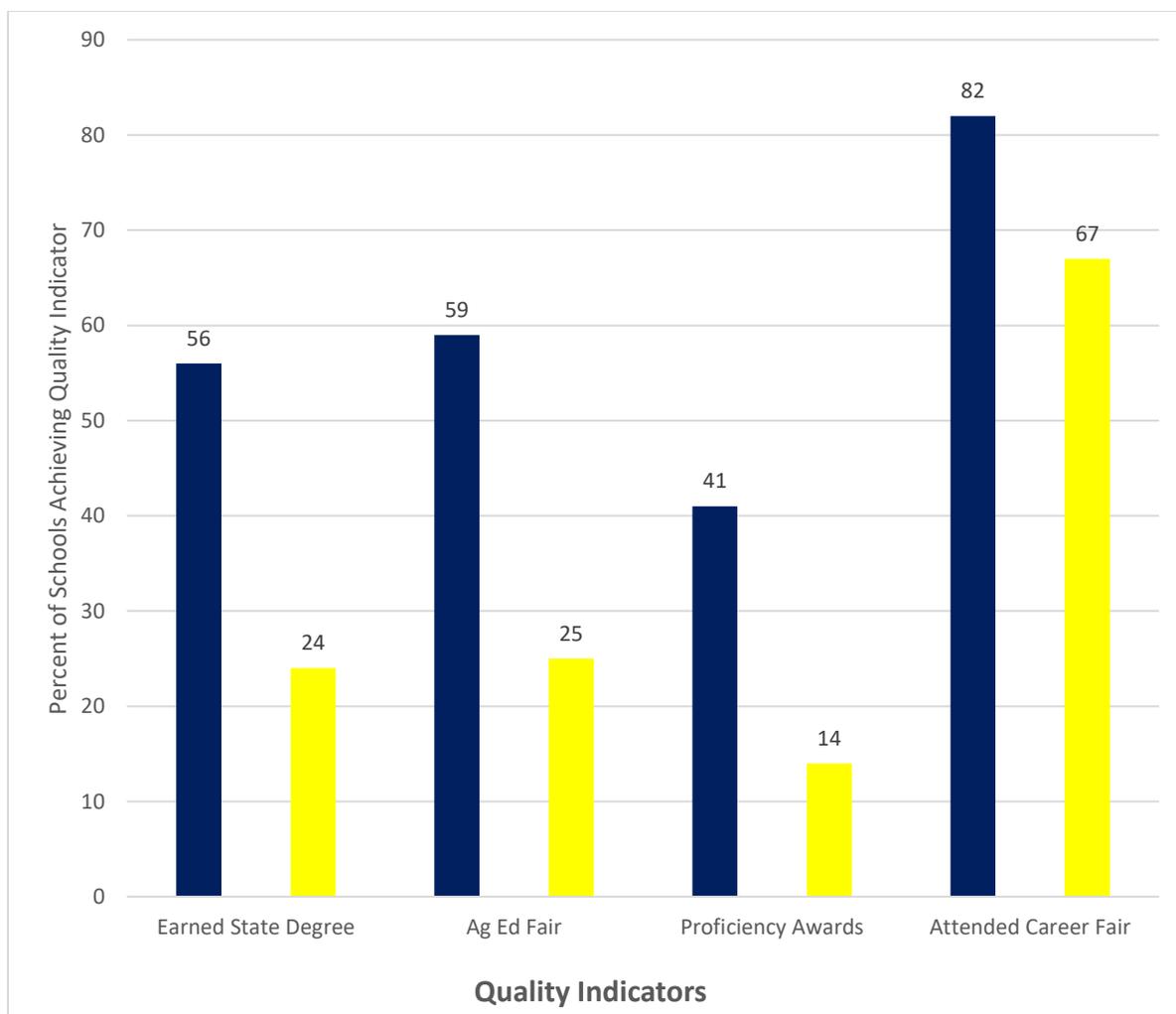


Figure 6. Licensed and Provisional Instructors Achievement of Quality indicators relating to Supervised Agriculture Experience.

Note: Blue bars are licensed instructors. Gold bars are provisional instructors.

conducted a banquet. The quality indicator based on hosting events was also categorized as leadership. Each year, schools and teachers hosted FFA and IAVAT meetings. Sixty-eight percent of schools with licensed instructors hosted events, and thirty-seven percent of schools with provisional instructors hosted events. All high school agriculture teachers were encouraged to attend the Illinois Association of Vocational Agriculture Teachers Annual Conference. At the

conference, dates were set for section, district, and state events. In-services were conducted to better prepare instructors for the most recent changes in agricultural education. Seventy-six percent of schools with licensed instructors attended the IAVAT Conference, but only forty-four percent of provisional teachers attended the event.

Quality indicators relating to the instructional program made up the third group of quality indicators (Table 10). The first quality indicator on the Incentive Funding Grant application was whether the instructor was a licensed instructor. If they were not a fully licensed instructor, the teacher checked the second quality indicator, which indicated a teacher licensed with stipulations. The licensed with stipulations and provisionally certified instructor were two terms for the same category of license. As Table 10 indicated, eighty-three percent of Illinois teachers were fully licensed over the past five fiscal years. Seventeen percent of Illinois schools' instructors were provisional, or licensed with stipulations, over the same five-year period. However, the number of schools with provisional instructors rose to twenty-two percent in fiscal year 2018.

According to Figure 7 the most popular FFA activities were conducting an FFA banquet and attending the Illinois FFA Conventions. Eighty-eight percent of the schools with licensed instructors attended the Illinois FFA convention and conducted a banquet. Sixty-four percent of schools with a provisional instructor attended the convention while seventy percent conducted a banquet.

Table 10.

Licensed and Provisional Instructors Achievement of Quality Indicators relating to FFA.

Quality Indicator	Licensed		Provisional		% Diff.
	n/N	%	n/N	%	
Active Alumni	849/1336	64	98/267	37	27
State Convention	1180/1336	88	171/267	64	24
Submit POA	898/1336	67	139/267	52	15
Conducted Banquet	934/1056	88	164/233	70	18
Hosted FFA Events	914/1336	68	100/267	37	31
IAVAT Conference	1019/1336	76	118/267	44	32
Active Alumni	849/1336	64	98/267	37	27

Note: n/N = number of teachers (numbers aggregated over five years – duplicated).

The lowest levels of achievement (illustrated in Figure 7) were both with schools having provisional instructors for hosting FFA events and maintaining active alumni chapters. The difference between the provisional and licensed instructors on hosting events was thirty one percent, while the difference between schools with licensed and provisional instructors was twenty-seven percent for active alumni chapters. The largest difference of all was for attendance at the IAVAT Conference. Schools with licensed instructors attended the conference at a rate of seventy-six percent, while schools with provisional instructors attend at the level of forty-four percent, which created a difference of thirty-two percent.

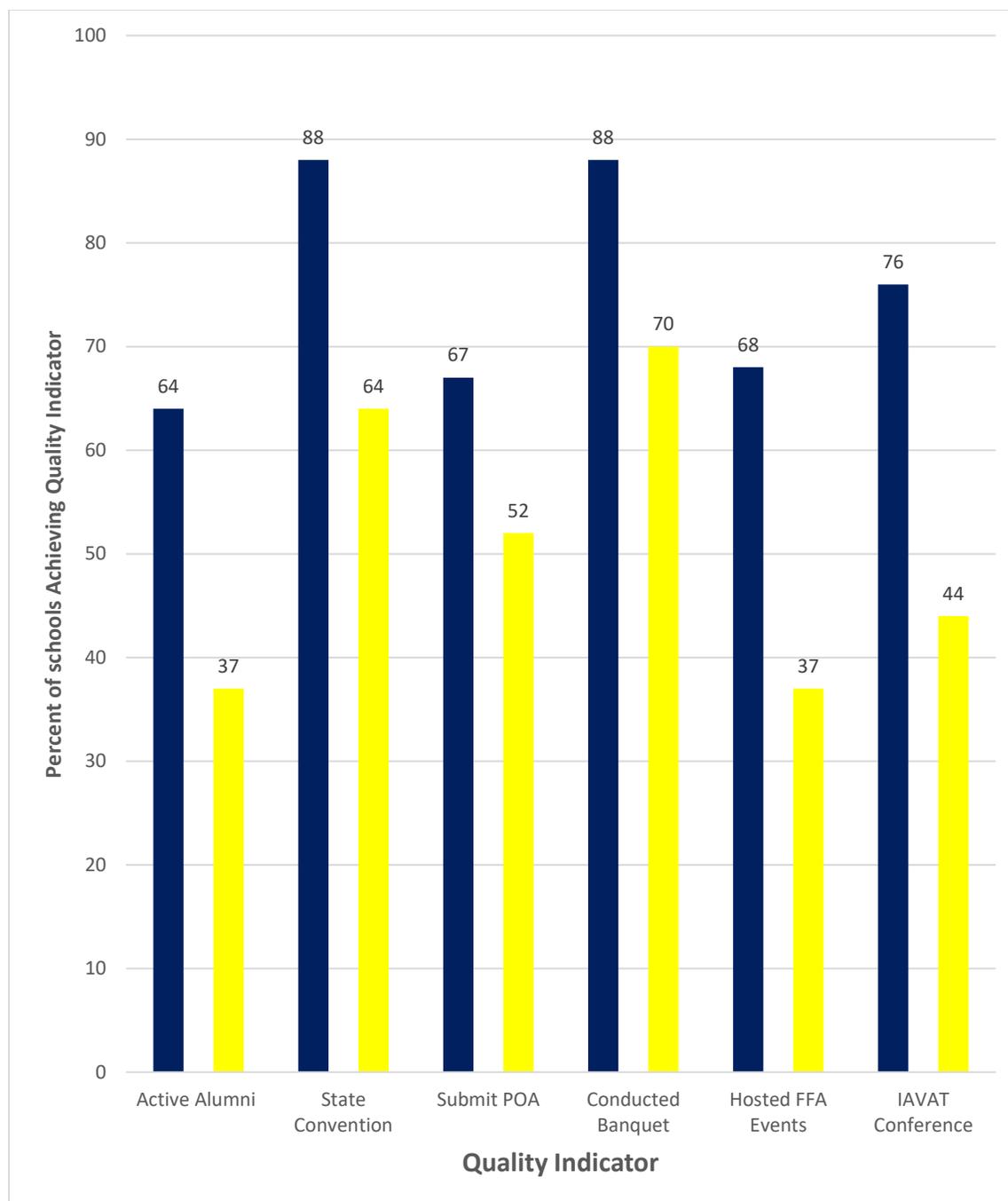


Figure 7. Licensed and Provisional Instructors Achievement of Quality Indicators relating to FFA.

Note: Blue bars are licensed instructors. Gold bars are provisional instructors.

Some schools in Illinois served as student teaching sites or observation sites for college students preparing for careers in agricultural education. Over the five-year period, thirteen

percent of schools with licensed instructors served as observation sites, and three percent of schools with provisional instructors provided college students with that opportunity. Thirty percent of schools with licensed instructors provided dual credit college courses for their students and twenty-three percent of schools with provisional instructors taught dual credit courses. Forty-four percent of schools with licensed instructors had master's degrees, while that dropped to twenty-two percent for schools with provisional instructors.

The next quality indicator was based on how a school utilized MyCaert. MyCaert was a commercial online curriculum provided to Illinois agriculture instructors and schools free of charge. MyCaert was used as resource for lesson plans, e-units, course outlines, and power points by teachers; and it provided study units, power points, and online testing for students. The quality indicator for MyCaert was broken into two options. The first option was the teachers being the only one utilizing MyCaert. Forty-eight percent of schools with licensed instructors and fifty-seven percent of schools with provisional instructors used MyCaert for only the teachers. Forty-four percent of schools with licensed instructors and thirty-one percent of provisional instructors used MyCaert for both the teachers and the students. The final quality indicator in the group for instructional program was advisory council meetings. Fifty percent of schools with licensed instructors and thirty-four percent of schools with provisional instructors had two or more advisory council meetings.

Table 11.

Achievement of quality indicators relating to the Instructional Program.

Quality Indicator	Licensed		Provisional		% Diff.
	n/N	%	n/N	%	
Type License of Instructor	1336/1603	83	267/1603	17	66
Advisory Council 2+	671/1336	50	90/267	34	16
Offered Dual Credit	413/1336	30	62/267	23	7
Master's Degree	586/1336	44	59/267	22	22
MyCaert Teacher	647/1336	48	151/267	57	-9
MyCaert Student&Teacher	581/1336	44	83/267	31	13

Note: n/N= number of teachers (numbers aggregated over five years – duplicated).

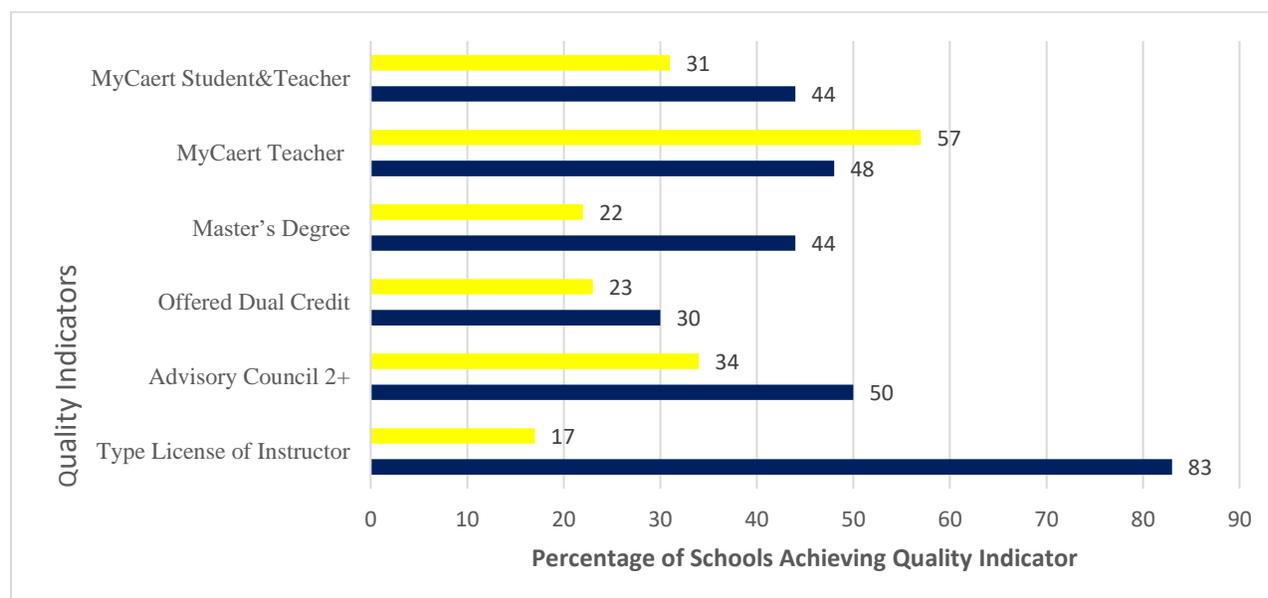


Figure 8. Achievement of quality indicators relating to the Instructional Program.

The factor analysis and the Pearson correlation coefficient both identified Career Development Events (CDE) as one of the most highly correlated quality indicators for a high X-Score (Table 3 and Table 4). Since CDE's were reported differently than other quality indicators, Table 12 was created to better reflect them. The Pearson correlation does not measure whether a school placed high or low in an event; only the number of schools which participated was reported. The mean score reported was the overall X-value for a school that participated in a significant number of events. If a school only participated in zero to two events, the school of a licensed instructor's mean X-score would be twenty-six percent and a school with a provisional instructor would be twenty-three percent. Table 12 demonstrated that as participation in CDE's increased, the percent of X earned increased as well. If a school with a licensed instructor participated in twelve or more CDE's the percentage rose to seventy percent, and the X for schools with provisional instructors rose to sixty-six percent.

Figure 9 provided an illustration of the inverse relationship that existed between of the number of CDE's a school participated in, and the type of license their teacher possessed. The trend lines in Figure 9 indicated that the percentage of participation for programs with provisional instructors dropped as it moved from participating in zero to one, up to the group of twelve plus. Furthermore, the percentage of licensed teacher's trend line increased, as it moved from zero to one until it reached the group of twelve plus CDE's. The smallest groups for licensed instructors, at a level of six percent, were the participation groups of 0-1 and the 2-3 CDE's, while the smallest group for schools with provisional.

Table 12.

## Achievement of Quality Indicator relating to Career Development Events

# CDE's	Licensed		Provisional		% Diff
	n/N	%	n/N	%	
0-1	75/1336	6	77/267	29	-23
2-3	86/1336	6	41/267	15	-9
4-5	153/1336	11	33/267	12	-1
6-7	215/1136	16	46/267	17	1
8-9	281/1336	21	35/267	13	8
10-11	221/1336	17	17/267	6	11
12+	304/1336	23	18/267	6	16

instructors, at seven percent, were the participation groups ten to eleven and twelve plus CDE's. The largest participation group for schools with provisional instructors was the group of zero to one, with a level of twenty-nine percent. The largest participation group for schools with licensed instructors was the group participating in twelve plus CDE's with a participation percentage of twenty-three.

In Table 4 the Pearson correlation coefficients were provided for participating in the groups of zero to one CDE's and twelve plus CDE's. The Pearson correlation coefficients were both highly statistically significant at the  $p < 0.001$  level. The Pearson correlation coefficient for the group of zero to one was -0.29, while inversely correlated the Pearson correlation coefficient for the group participating in twelve plus was 0.43, positively correlated.

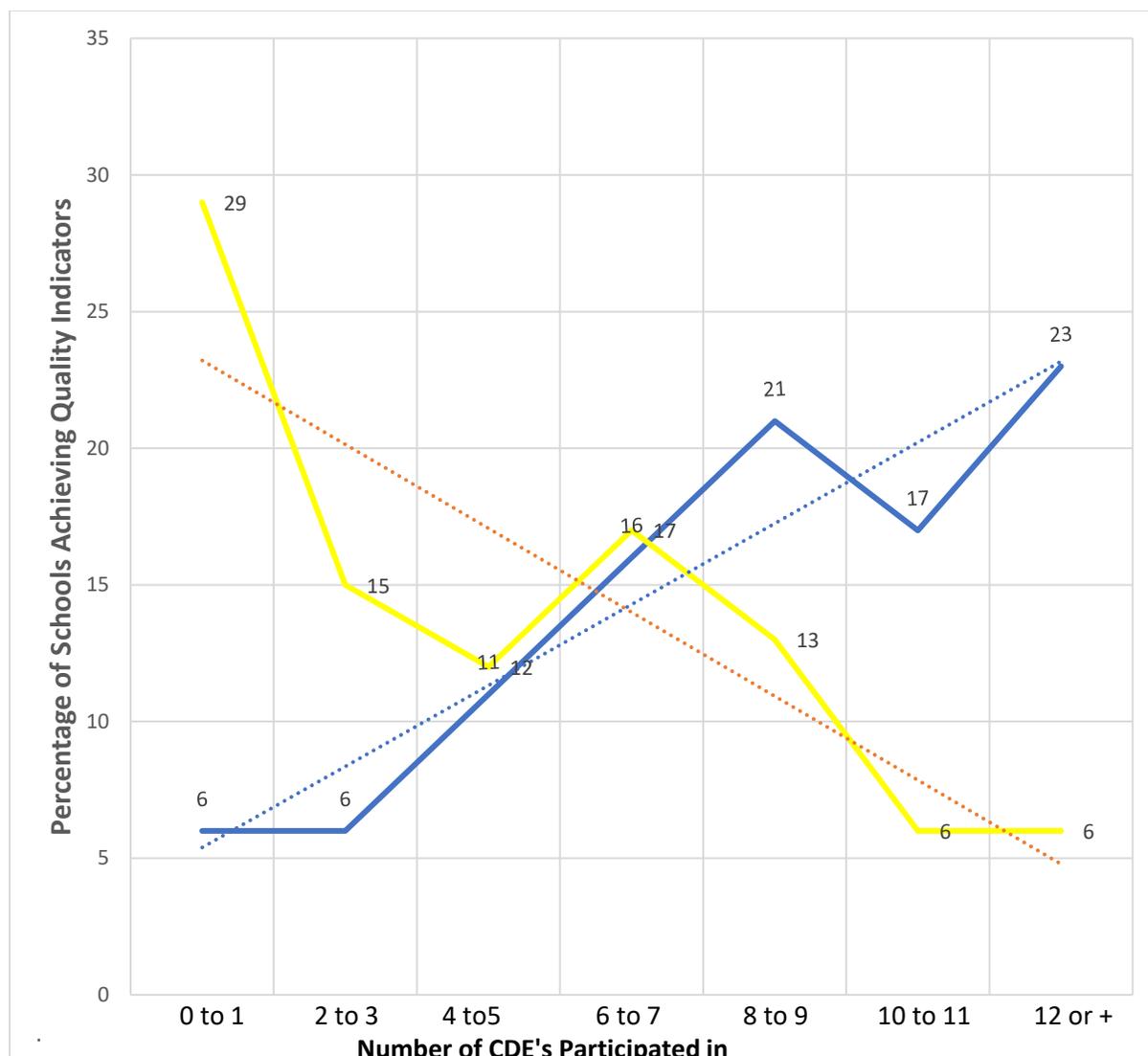


Figure 9. Achievement of Quality Indicator relating to Career Development Events.

3. *What influence did gender, retention within the district, geographic region, and length of a contract have on the quality of a high school agriculture program?*

The third research question inquired as to whether other factors existed that impacted the quality of an agriculture program, besides the type of license the teacher held. Table 13 demonstrated whether gender of the instructor impacted the X-scores a school received. This data covered the previous five fiscal years. School's that had one male as its teacher had a mean X-score of fifty-three percent. School's that had a female as its instructor had an X-score of fifty-two percent.

Two-teacher departments with a female and a male had a score of sixty-two percent. A two-teacher department with two males had a X-score of sixty-four percent, while a program with two female teachers dropped to an X-score of fifty-five percent (n = 29). Programs with three or more teachers had the highest percentage at seventy-five.

Table 13.

Genders Influence Upon Quality Indicator Scores.

Gender of Instructor	N	M	SD	SE
Female	559	0.52	0.20	0.01
Male	807	0.53	0.19	0.01
Male & Female	106	0.62	0.18	0.02
Male & Male	71	0.64	0.19	0.02
Female & Female	29	0.55	0.25	0.04
Three or More Teachers	31	0.75	0.17	0.03

The influences of gender of the instructor on the quality of the agriculture program are illustrated in Figure 10. According to Figure 10 there was not a significant difference in quality between three of the groups; which were a school with one male, one female, or two female instructors. Those instructors shall be called group a. There is not a significant difference between a school with male and female or two male instructors, which shall be referred to as group b. However, there was a significant difference between group a and group b. Although the three or more teachers had a much larger X-score, I have left the three or more teachers out of the comparisons due to the inability to group them and maintain a large enough sample size.

The standard error varied from 0.007 to 0.04 which caused a noticeable variety in the size of the error bars.

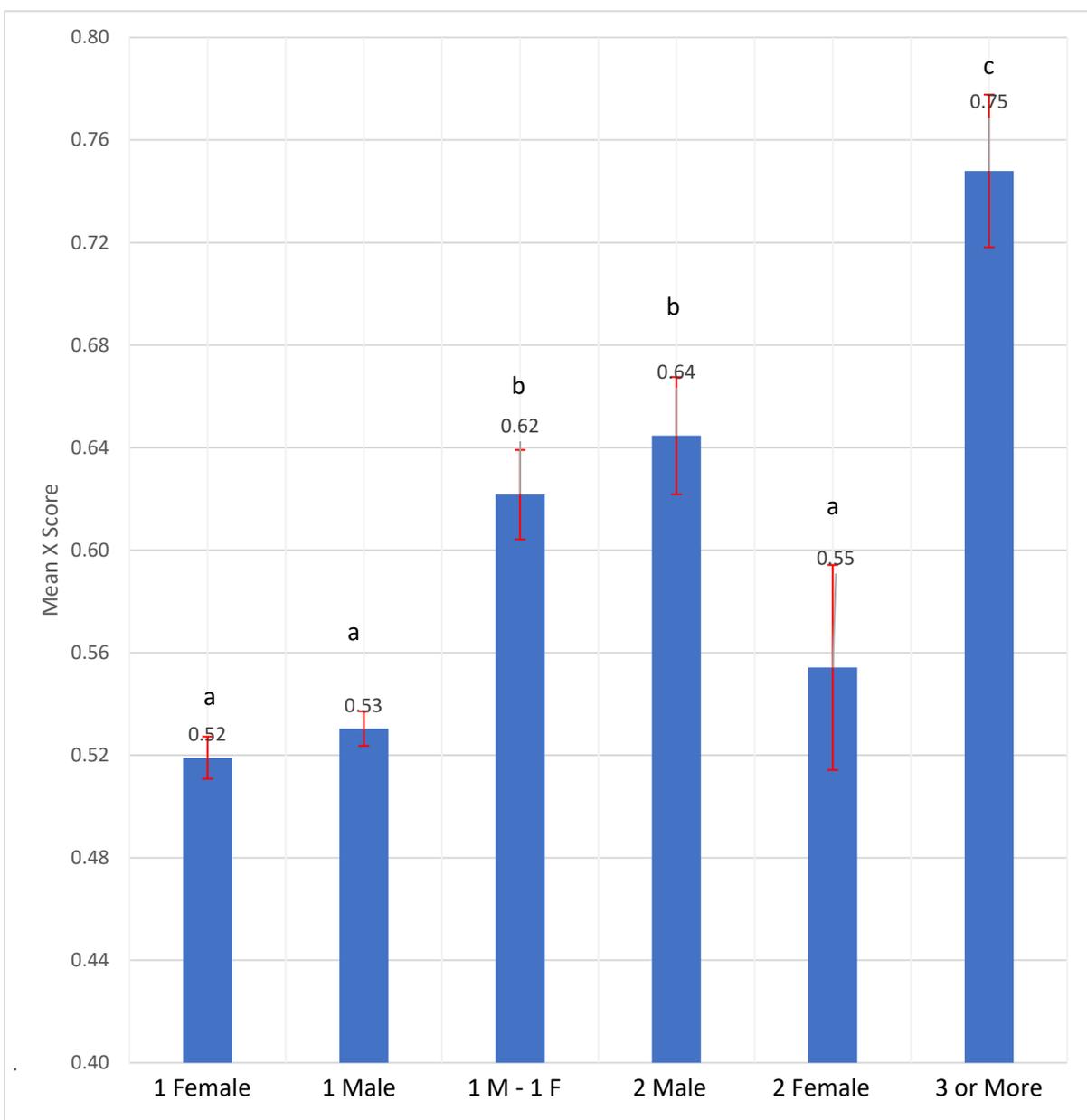


Figure 10. Genders Influence Upon Quality Indicator Scores

The length of a teacher’s contract was significantly correlated with a school’s X-score in both positive and negative ways. A school with a teacher having a nine-month contract resulted in a

mean X-score of 0.36 (Table 14). With the overall mean for all schools at 0.54, a school with a teacher on a nine-month contract performed 18 percent below average. Table 13 indicated mean X-score increases with contract length monotonically until reaching the 12-month contracts, where the average X-score dropped by two percent from 66 to 64. The mean scores in Table 13 were very similar to the economic principle of diminishing returns.

Table 14.

Length of Contract's Influence on Quality Indicator Scores

Contract Length	N	M	SD	SE
9	213	0.36	0.19	0.01
9.5	281	0.46	0.17	0.01
10	422	0.55	0.18	0.01
10.5	314	0.59	0.15	0.01
11	267	0.67	0.14	0.01
12	101	0.65	0.21	0.02

A uniform increase in the school's X-score as a teacher's contract increased was demonstrated in Figure 10. Each movement to the right shows a significant difference, until the eleventh and twelfth months are reached. Although the percent X-score begins to fall at twelve months there was no significant difference between an eleven and a twelve-month contract.

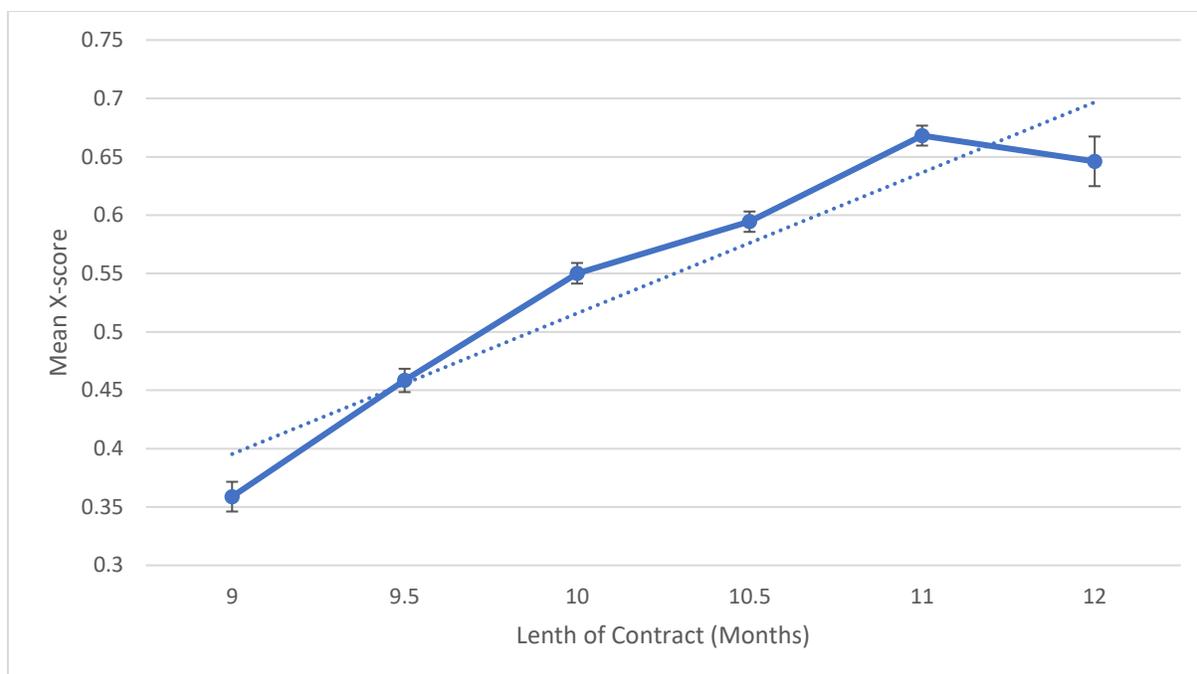


Figure 11. Length of Contract's Influence on Quality Indicator Score

The influences of retention, or failure to retain teachers is presented in Table 15. The group numbers reflected the number of teachers the school had during the five-year fiscal period from fiscal year 2014 to fiscal year 2018. The one-teacher schools were the largest group with one hundred and eighty-five schools, and the highest mean X-score with fifty-nine percent. The two-teacher schools showed a small drop of about five percent. The three-teacher schools were almost ten percent behind the schools that retained their instructors for all five years. The four-teacher school groups contained twelve schools. They had a forty-three mean X-score. The four-teacher schools were seventeen percent lower than one teacher schools. The five-teacher schools were performed the lowest. They had five different teachers over the five-year period. The five teacher schools had an X-score of thirty-seven percent, which was twenty percent behind the one teacher schools. It should be noted, there were only two schools in group five, and they had a standard error of the mean of 0.0167.

Table 15.

## Retention of Teachers Influence Upon QI Scores Over Five Years

# of Teachers over 5 Years	N	M	SD	SE
One Teacher	185	0.59	0.18	0.01
Two Teachers	65	0.54	0.14	0.02
Three Teachers	38	0.49	0.16	0.03
Four Teachers	12	0.43	0.15	0.04
Five Teachers	2	0.37	0.02	0.02

Figure 12 demonstrated a significant difference between teacher retention groups one, two and three. There was not a significant difference between groups three and four. Group one through four showed a significant difference from group five.

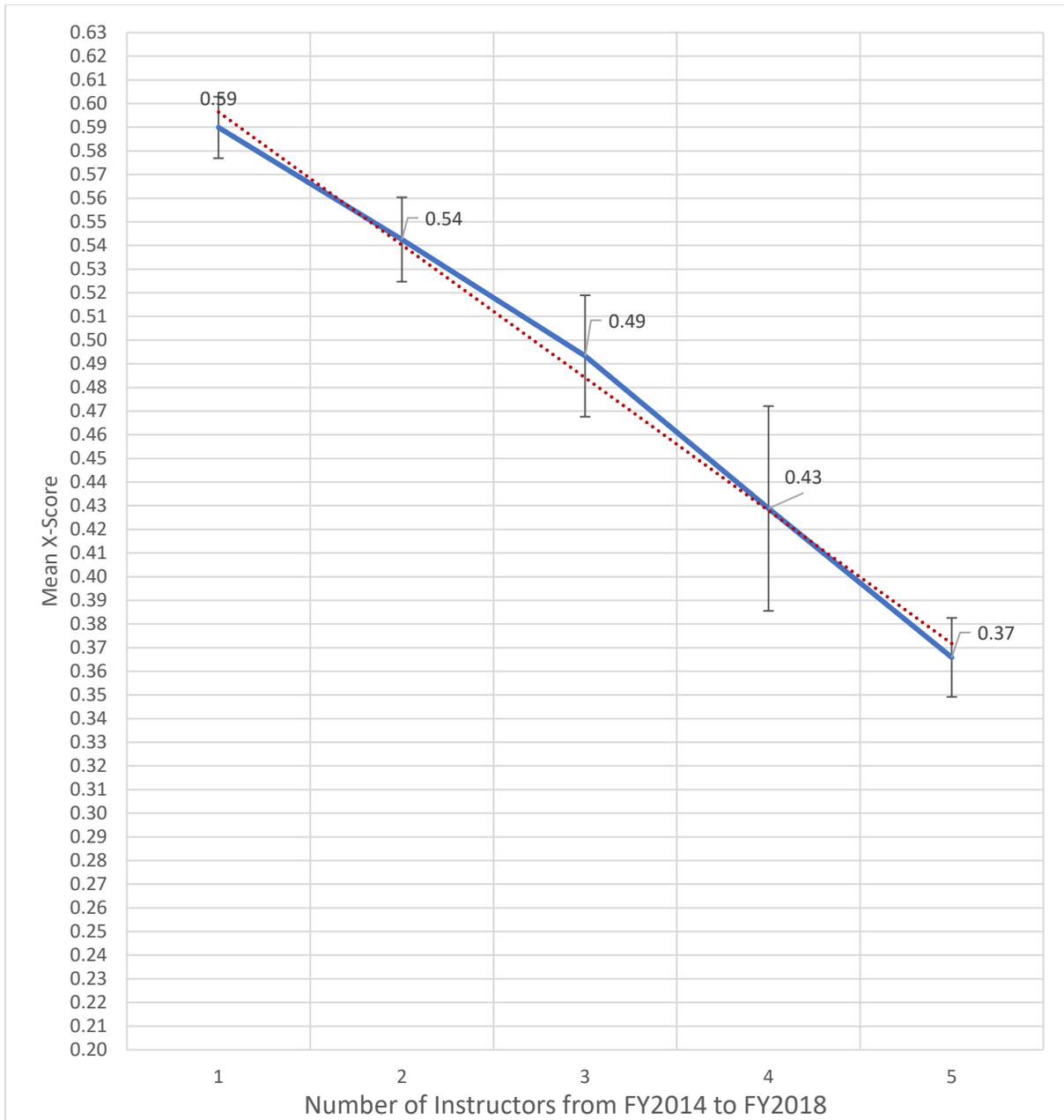


Figure 12. Retention of Teachers Influence Upon QI Scores Over Five Years.

The differences in quality indicator scores based upon geographic location (See Appendix G) were examined and reported in Table 16. District I was the northwestern section of Illinois, and District II was the northeastern part of Illinois, which included the city of Chicago. District III was the west-central area, and District IV was the east-central region of Illinois. District V was the southern part of Illinois, including both the eastern and western sides. When broken down

into districts, there were distinct differences in mean of X-scores. District I had the highest mean with fifty-eight percent, while District II had the lowest mean with fifty percent. Districts III, IV, and V fell between fifty-four and fifty-five percent.

Table 16.

Mean X-Scores for Geographic Districts in Illinois FY14 to FY18.

District	N	M	SD	SE
I	283	0.58	0.19	0.01
II	323	0.51	0.24	0.01
III	316	0.56	0.18	0.01
IV	309	0.54	0.18	0.01
V	327	0.54	0.18	0.01

Note: N = number of schools aggregated over five fiscal years

According to Figure 13 the highest X-score occurred in District I. District I was significantly different than District II, IV, and V. District II was significantly lower than all the other four districts. District I and District III were not significantly different from each other. The trend line displayed a slow drop in X-score percentage as it moved from District I to District V.

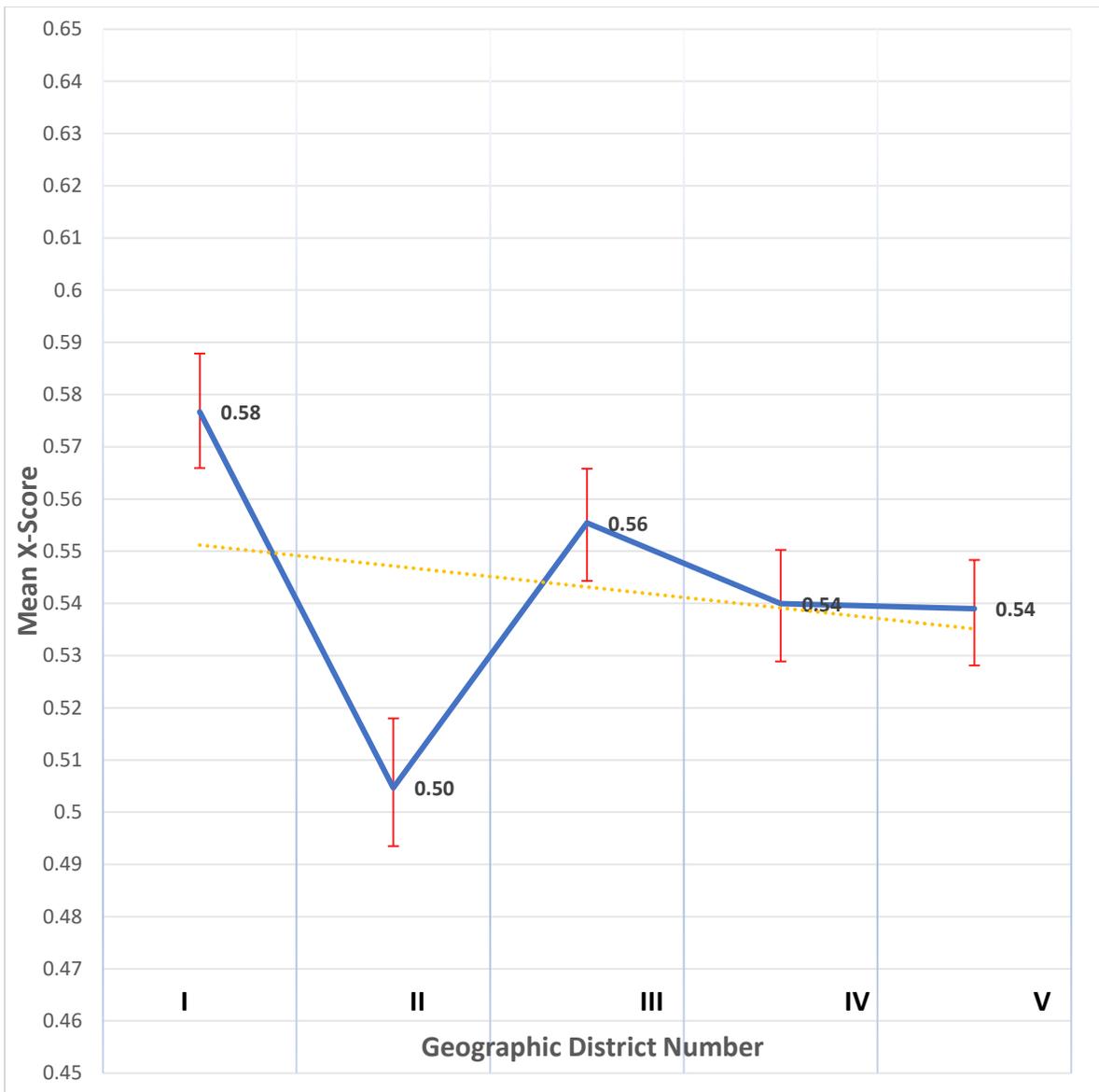


Figure13. Mean X-Scores for Geographic Districts in Illinois FY14 to FY18.

Table 16 represented an effort to examine geographic regions more closely. Instead of five districts, twenty-five sections were examined and compared. Section one was located on the north-western tip of Illinois and section 25 was located on the south-eastern tip of Illinois. Each of the five districts above contained five sections. The Districts were organized as follows: District I - Sections 1-5; District II – Sections 6-10; District III – Sections 11-15; District IV – Sections 16-20; and District V – Sections 21-25. There was an average between twelve and

thirteen schools in each section. Section 4 and Section 11 essentially tied for the highest mean with 0.65. Section 8 was the lowest achieving section with a mean of 0.24.

Table 17.

Mean X Scores for Geographic Sections of Illinois, FY14 to FY18.

Section	N	M	SD	SE
1	64	0.52	0.16	0.02
2	55	0.56	0.23	0.03
3	64	0.60	0.19	0.02
4	50	0.66	0.14	0.02
5	50	0.56	0.19	0.03
6	66	0.56	0.19	0.02
7	54	0.59	0.22	0.03
8	83	0.24	0.18	0.02
9	65	0.63	0.14	0.02
10	55	0.60	0.18	0.02
11	56	0.66	0.18	0.02
12	62	0.52	0.20	0.03
13	67	0.55	0.20	0.02
14	65	0.55	0.15	0.019

15	66	0.52	0.17	0.02
16	66	0.55	0.21	0.03
17	63	0.58	0.17	0.02
18	54	0.49	0.18	0.02
19	59	0.57	0.17	0.02
20	67	0.50	0.16	0.02
21	80	0.56	0.18	0.02
22	90	0.52	0.19	0.02
23	62	0.63	0.18	0.02
24	80	0.49	0.17	0.02
25	60	0.51	0.14	0.02

---

The largest variation was clearly demonstrated in Figure 14. Section 8 had an average X-score of 24 percent. Four sections were over 60 percent, while fifteen sections were found to be between 50 and 60 percent. Only two sections scored in the forties and both had a score of forty-nine percent.

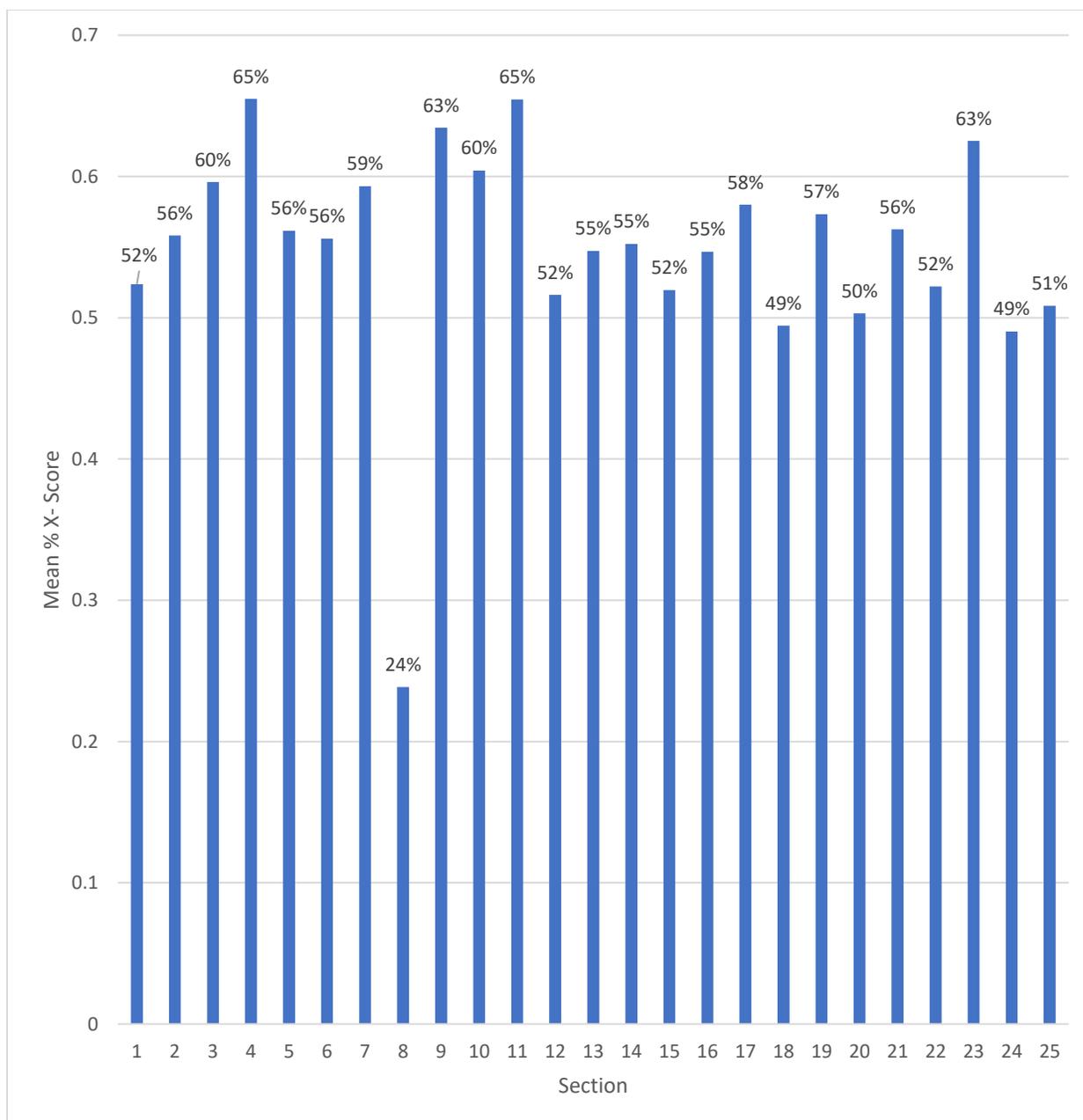


Figure 14. Mean QI Scores for Geographic Sections of Illinois, FY14 to FY18.

### Summary of Findings

1. A statistically significant difference existed between the quality of high school agriculture programs with licensed instructors, compared to high school agriculture programs with provisionally licensed teachers (p-value). The five-year average for programs with licensed instructors was 57 percent, while the average X-score for

- schools with a provisional instructor was 38 percent. The grand mean X-score for every high school for the five-year period was 54.2 percent
2. There was no significant difference between each year's fiscal year overall X-score, from fiscal year 2014 to fiscal year 2018 (p-value). The overall X-scores were consistent and ranged from 53 to 55 percent.
  3. As pertaining to the sixteen quality indicators having a high correlation to a school's total X-scores, the schools with licensed instructors had a higher percentage of achievement in fifteen of the sixteen cases. The only quality indicator that the schools with provisional teachers achieved a higher percentage was a quality indicator that had high negative correlation to the school's X-scores.
  4. When the number of Career Development Events were calculated for each school, there was an inverse relation between schools with licensed teachers and schools with provisional teachers. The percentage of schools with licensed instructors increased as the number of events attended increased; by contrast, the percentage of schools with provisional instructors as the number of contests participated in increased.
  5. The influence of gender on the quality of agriculture programs was reported based on six groups. There was not a significant difference in quality or X-scores between three of the groups, which were schools with one male teacher, one female teacher, or two female instructors. There was not a significant difference between schools with male and female teachers or two male instructors. There was a significant difference between the groups with one female, or male teacher, or two females; and the two teacher departments with one male and one female, or two males. Although the three or more teachers had a much larger X-score (75 percent), I have left the three or more

- teachers out of the gender group comparisons due to the inability to group them within a large enough size sample.
6. Schools with instructors on nine-month contracts had thirty percent lower X-scores than schools with teachers on an eleven-month contract. Each half-month increase in length of contract resulted in a uniform increase of X-score and a significant difference, until the eleventh and twelfth month was reached. Although the percent X-score fell at twelve months, there was no significant difference between an eleven and a twelve-month contract(p-value).
  7. A negative relationship existed between failing to retain an instructor and higher X-scores. With each loss of a teacher, the schools X-score dropped at least five percentage points. There was a significant difference between teacher retention groups one, two and three. There was not a significant difference between groups three and four.
  8. Significant differences existed between the five geographic districts in Illinois. District I was significantly higher than District II, IV, and V. District II was significantly lower than all four of the other districts. The trend line displayed (Figure 13) a slow drop in X-score percentage as it moved from District I to District V.
  9. Geographic differences within the twenty-five sections was extreme, especially in one case. Section 8's X-score of twenty-four percent was the lowest, and significantly lower than every other section in the state. Four sections were over 60 percent, while fifteen were found to be between 50 and 60 percent. Only two sections scored in the forties, and both had a score of forty-nine percent.

## CHAPTER 5

### CONCLUSIONS, RECOMMENDATIONS, AND IMPLICATIONS

#### Purpose

The purpose of this study was to evaluate the impact of the shortage of licensed instructors on the quality of high school agriculture programs in Illinois, and to determine whether the hiring of provisional instructors affects the quality of a high school agriculture program. In addition, the research examined other issues that affect the quality of agriculture programs; such as retention, gender, length of contract, and the school's geographic region.

To accomplish this, the study collected all the information from each Illinois high school agriculture program's Incentive Funding Grant Applications from fiscal year 2014 to fiscal year 2018. The data was collected from the Illinois Agricultural Education website (Illinois Agricultural Education, 2017).

#### Research Questions

To achieve the purpose of the study, the research concentrated on answering the following research questions:

1. *What impact does the type of license a high school agriculture teacher possesses have on the quality of a high school agriculture program?*
2. *Which of the quality indicators in the Illinois Incentive Funding Grant (IFG) application are the most strongly correlated to a high quality secondary agricultural education program, as indicated by a high X-score on the IFG application?*
3. *What influences gender, retention within the district, geographic region, and length of a contract have on the quality of a high school agriculture program?*

### **Study Design and Procedure**

This quantitative longitudinal repeated measure research design involved the mining and analysis of existing online data, which covered a five-year period from fiscal year 2014 to fiscal year 2018. The information for retention and gender of the teachers within the schools was obtained from Dean Dittmar, the Illinois Agricultural Education website (Ag Ed Directory, 2017), and the Illinois FFA Center in Springfield, Illinois. HTTrack Website Copier 3.48-21, A (spyder) software, was employed for data mining purposes, and the independent variables included the teachers' teaching license type, gender, degree earned, longevity, and each school's quality indicator totals. The means were calculated for each year, and the different groups were compared. The data was stratified into section, district, and state for comparison purposes.

### **Population**

The target population of this study was comprised of two groups. The first group included the fully licensed high school agriculture instructors within the state of Illinois over the past five years. During the 2016-2017 school year, there were 391 high school instructors in Illinois. Each agricultural education instructor was evaluated by his/her program's quality indicators, and therefore the terms "program" and "teacher" were used interchangeably in this study. The term "school" and "program" were used interchangeably as well. The data that was used in this study already existed within summary reports produced by the Illinois State Board of Education and archived in an online repository. Fifty-seven percent of Illinois secondary agriculture instructors were men, while 43 percent were women. One hundred and two instructors in Illinois were provisionally certified. Thirty-eight percent of Illinois secondary agriculture teachers possessed master degrees. The agriculture teachers' names, schools, mailing addresses, and email addresses were available through the Illinois Association of Vocational Agriculture Teachers

(IAVAT) directory (Ag Ed Directory, 2017). The directory was updated each year by FCAE and IAVAT. A census sample was employed, accessing data on all teachers in the geographic designations of the IAVAT; which divided the state of Illinois into 25 sections and five districts.

### **Instrumentation**

Prior to data mining, total X-scores for each school were calculated from the total dollar amount for the Incentive Funding Grant award from the Agricultural Education website (Hepner, 2017) for the past five years (FY2014-FY2018). After the total X-values were calculated, they were converted to percentages. This was done because the total number of X-values changed from year to year and by converting to a percentage, this variation was eliminated, making the data consistent. (See X-values on IFG application (Appendix A).

An Illinois State Board of Education (ISBE) consultant provided dollars per X in each year's grant and the X values were manually inputted into an excel spreadsheet (Appendix B). A formula was then used to convert the total X-score into a X-score percentage. This provided a general measure for each school, which would in turn provide a five-year average for each school, as well as an average X-value for each fiscal year; thus, identifying low performing and high performing school districts.

### **Data Collection & Analysis**

SPSS 24 was utilized to analyze the quantitative data collected from the Incentive Funding Grant repository using descriptive and parametric statistics. Spreadsheets were created that contained the descriptive archived data from the Incentive Funding Grant concerning gender, longevity, degree held, quality indicators earned, and type license the instructor held. The data was then analyzed in a longitudinal manner over a period of five years, fiscal year 2014- fiscal year 2018. The number of quality indicators, or X-values earned, served as the

dependent variable; while the gender, longevity, degree, and licensure served as the independent variables. The study broke the data down in a stratified manner that provided data for not only the state level, but the section and district as well. Each data group was assigned an average and the averages between the groups were analyzed. Tables, figures, and graphs have been used to further illustrate or explain the data. One-sample t-tests were used to compare the mean X-scores to selected independent variables.

### **Data Mining**

To analyze over 180 quality indicators in the Incentive Funding Grant Application, identifying those more directly related to a high X-score, an initial excel spread sheet was constructed to collect data points by collecting weblinks to each of the individual quality indicators archived on the Agricultural Education website. WinHTTrack, a spyder software used for data extraction from online sources (Roche, 2017), was employed to take data from those sites whose weblinks were downloaded onto the initial Excel spreadsheet (Appendix C). It converted and transferred the HTML language into Excel in a data form that could be inputted into the Statistical Package for the Social Sciences (SPSS), version 24. A template with formulas was created to translate the data into a binary form. A single comprehensive formula was developed to convert school names into numbers; thus, recording all data points for each school from the different weblinks on the Agricultural Education website.

### **Major Findings**

*Research Question 1: What impact does the type of license a high school agriculture teacher possesses have on the quality of a high school agriculture program?*

### **Licensed or Provisional**

The type of license an agriculture teacher holds influences the quality of the high school agriculture program. The high school agriculture programs with a fully licensed instructor had an average Incentive Funding Grant score of fifty-seven percent, while high schools with a provisionally licensed instructor had an average Incentive Funding Grant score of thirty-eight percent. When broken down by fiscal year, the schools with provisional instructors trailed schools the licensed instructors every year. The largest difference was in fiscal year 2016 when the gap was twenty-one percent. The smallest difference was in fiscal year 2017, when the difference was sixteen percent. One should also note that over the five-year period of this study, the number of schools with provisional instructors has more than doubled from thirty-four in fiscal year 2014 to sixty-nine in fiscal year 2018.

*Research Question 2: Which of the quality indicators in the Illinois Incentive Funding Grant application are the most strongly correlated to a high quality high school agricultural education program, as indicated by a high X-score on the IFG application?*

### **Pearson Correlation**

The Illinois Incentive Funding Grant Application evaluates Illinois high school agriculture programs with one-hundred and seventy-six different quality indicators. It should be noted that only 19 of the 176 failed to meet Pearson Correlation significance level of 0.01 (2-tailed).

### **Quality Indicators Achieved**

The study selected sixteen quality indicators that had a high-level correlation to the school's Incentive Funding Grant X-scores. The quality indicators selected from the Incentive Funding Grant were grouped under three program components: classroom instruction, the supervised agriculture experience program, and the FFA. Several of the quality indicators with the highest

Pearson correlations were also the highest factors in the factor analysis. The quality indicators of having students earn state FFA degrees and bringing six or more SAE's to proficiency award judging, both appeared with the highest indices in the Pearson correlation and the factor analysis. The percentage of programs with provisional and licensed instructors that achieved the quality indicators were then compared.

In fifteen out of the sixteen quality indicators, the schools with licensed instructors had a higher completion percentage than the schools with provisional instructors. In nine out of the sixteen quality indicators, the provisional instructors were between twenty-two to thirty-four percent lower than the licensed instructors. The only quality indicator that schools with provisional instructors were higher was the indicator that related to only teachers using MyCaert; however, it is necessary to point out that indicator had a negative correlation index of -0.215.

*Research Question 3: What influence does gender, retention within the district, geographic region, and length of a contract have on the quality of a high school agriculture program?*

### **Gender**

In single teacher departments, the influence of the instructor's gender was minimal. Single department male teachers were fifty-three percent and females were fifty-two percent. The overall X-score percentage was fifty-two percent, without any consideration of gender. There was a much larger variation in the percentages between gender groups within two teacher departments. The male and male departments had the highest mean percentage with sixty-four percent. The female and female had the lowest with fifty-five percent. The programs with a male and female teacher had a mean score of sixty-two, which was nine points higher than single teacher male programs. When disregarding gender, the overall X-score percentage for two-teacher departments was sixty two percent. High school agriculture programs with three or more instructors had the highest X-

score percentage of seventy-five percent, which was twenty-three percent high than single teacher departments. Unfortunately, there was no clear way to create female and male gender groups for the three or more instructors, and still maintain a population large enough for a reliable sample.

### **Length of Contract**

The length of a teacher's contract had an influence similar to the economic principle of diminishing returns. The programs with teachers possessing nine-month contracts were the lowest. As the contract length went up, the percent X-score went upward quickly, and at the eleven-month contract it hit its peak of sixty-seven percent. However, the programs with a twelve-month contract were three percentage points lower, than the eleven-month contracts. The twelve-month contract was still almost thirty percent higher, than the nine-month contract.

### **Teacher Retention**

The high school agriculture programs retaining the same teacher over the full five years had the highest X-score with fifty-nine percent. There was a very uniform drop in percentages between all five retention groups. The two-teacher retention group's X-score was six percent lower than programs in the one-teacher retention group. The three-teacher retention group was five percentage points behind the two-teacher retention group. The four-teacher retention group was six points behind the three-teacher retention group. The five-teacher retention group was six percentage points behind the four-teacher retention group. The range between retention group one and retention group five was fifty-nine percent to thirty-seven percent.

### **Geographic Region**

The influence of geographic region on the quality of agriculture programs was broken down into two groups, which were districts and sections. The geographic influence on the quality of programs within the districts was rather small. The highest performing district was District I with

fifty-eight percent X-score, while the lowest was District II with fifty percent X-score. District IV and District V were both fifty-four percent, while District III was fifty-six percent. There was a great deal more variation in the percentages between the twenty-five sections in Illinois. The highest section was Section 4 and Section 11 with sixty-five percent X-score; however, the lowest section was Section 8 with twenty-four percent X-score. The difference between the lowest section and the highest was quite large at forty-one percent.

### **Conclusions**

The conclusions of this study were not to be generalized beyond the Illinois High School Agriculture Programs. The major findings presented in this study support these conclusions.

1. A statistically significant difference exists between the quality of high school agriculture programs with licensed instructors, and high school agriculture programs with provisionally teachers. Therefore, the shortage of licensed instructors has had a negative impact on the quality of high school agriculture programs in Illinois.
2. As pertaining to the fifteen quality indicators having a high correlation to a school's total X-scores, the schools with licensed instructors had a much higher percentage of achievement, than schools with provisional instructors in fifteen of the sixteen highly correlated quality indicators. However, the only quality indicator in which schools with provisional teachers achieved a higher percentage a quality indicator that had a high negative correlation to the school's X-scores.
3. Gender makes very little difference in single teacher departments. However, there was a significant difference between the single teacher schools with one male or female teacher and the schools with two males, or a male and female instructor. There was no significant difference between single teacher departments and

- departments with two females. Furthermore, there was a significant difference between schools with two male instructors as opposed to schools with two female instructors. The three or more teacher departments had the highest X-scores with seventy-five percent; unfortunately, there were no clear groupings of male and female to differentiate the gender groups of those instructors.
4. The length of an agriculture instructor's contract had a great deal of impact on the quality of the agriculture program. Schools with instructors on nine-month contracts had thirty percent lower X-scores than schools with teachers on eleven-month contracts. With each incremental increase in contract there was a significant difference between the groups of contract length. There was no significant difference between the eleven-month contract and the twelve-month contract.
  5. The positive influence of retaining a teacher was very clear. A negative impact was indicated with the loss of each teacher. With each loss of a teacher, the school's X-score dropped at least five percentage points. There was a significant difference between the groups that had one, two, or three teachers over the five-year period. There was not a significant difference between schools with three or four teachers over the five-year period. Groups one through four were significantly different than school group five, or schools with five teachers, over the five-year period.
  6. Geographic differences existed both within the five districts and the twenty-five sections. District I was significantly higher than District II, IV, and V. District II was the lowest in average X-score percentages, and was significantly different from District I, III, IV, and V. The differences between the range of X-score percentages were much higher between sections, than they were between districts. Section 8 had

the lowest X-score of twenty-four percent. Section 8 was the city Chicago and the counties around it. The average score throughout the state was fifty-five percent. The fact Section 8's X-score percentages were less than half of the Illinois section average indicated there was, according to the Illinois Incentive Funding Grants' quality indicators, a very large difference in the quality of the agriculture programs in Section 8, when compared to the rest of the sections in the state of Illinois. Geographic differences between the five districts in Illinois were relatively small. The highest average X-score was fifty-eight percent while the lowest was fifty-one percent; while Section 4 and eleven tied for the highest X-score percentage with sixty-five percent.

### **Recommendations**

The following recommendations were made based on the researcher's observations during the study, reflections upon the major findings, and further examination of the conclusions.

1. A study should be conducted to compare fully licensed and provisionally licensed instructors at the same number of years teaching experience.
2. A study should be conducted to determine the difference in quality between programs with two licensed teachers and programs with a licensed and a provisionally licensed instructor.
3. Based upon the data contained in this study, efforts should be taken to provide in-service training for provisional instructors in Illinois in the areas of classroom instruction, FFA, and Supervised Agricultural Experiences.
4. Mentor programs should be implemented to benefit provisionally licensed instructors.

5. Innovative efforts should be made to improve the quality of the agriculture programs in Section 8.
6. Funding should be encouraged and supported to increase the length of contracts for Illinois agriculture instructors.
7. A study should be conducted that investigates gender and its correlation to retention.
8. The Illinois State Board of Education and the universities with agriculture education programs should coordinate efforts to provide both online and supervised training programs for provisional instructors. This program could provide a clearer path to obtaining a teaching license, while keeping the provisional instructors in the classroom.

### **Implications**

Based on the conclusions of this study, the shortage of licensed agriculture teachers had a serious impact on the quality of high school agriculture education in Illinois. For many years, the need for licensed high school agriculture teachers has exceeded the supply. The number of provisional instructors doubled from the start until the end of this study. Almost one in four teachers in Illinois lacks full licensure. We must stop the current system of using provisional teachers as a temporary fix, until a licensed instructor is hired. However, I absolutely am not advocating the removal of provisional instructors from their classrooms. The research also showed failure to retain instructors greatly impacts the quality of a high school agriculture program. Furthermore, I suggest we take steps of inclusion rather than exclusion. We provide financial incentives, in-service workshops, online courses, and a realistic path to becoming a licensed teacher. Quitting their jobs to return to the universities for clinicals and student teaching is not a practical plan, and it only leads to higher levels of attrition.

One of the largest variations within the study was within the geographic variable. Section 8's X-Score of 24 percent compared with most of sections between 50 and 60 percent presents an alarming difference. At the beginning of the study, I considered excluding the Chicago area schools from the study, but to do a thorough study I included them. Many studies could be conducted concerning Section 8, and the measurement of an agriculture program's quality. The researcher has absolutely no doubt the agriculture programs in Section 8 have outstanding teachers and students. However, by the three-circle concept of a quality agricultural education program, they fail to achieve at the level of other schools throughout Illinois.

When I included the gender portion in this study, it was out of sheer curiosity. The fact gender made no significant difference in single teacher departments was of little surprise to me. What I found most interesting was the dynamics of the two-teacher departments. I was shocked at how much higher the two-male schools X-scores were than two female schools. The two females schools did have a smaller sample size. I will revisit the gender portion of this study to increase the sample size by adding a couple more years of data, and may the best gender win!

As I wrap up this study, I would suggest that the challenge to the quality of agriculture programs in Illinois presented by a growing number of provisional instructors and the urban agriculture programs in Section 8 are somewhat related. Earlier I mentioned we must work with a sense of inclusion rather than exclusion. From my professional experience, provisional instructors and horticulture programs in Illinois have always seemed to be stigmatized or treated as second class citizens. I would contend not long-ago females were in that same group, but not anymore. We need to remove these labels and provide paths for success and participation for everyone.

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## APPENDICES

## APPENDIX A

**Human Subjects Approval**

This study was approved by the Southern Illinois University Carbondale Human Subjects Committee on February 13, 2018.

## APPENDIX B

Illinois Agriculture Education website page publishing dollar amounts for Incentive Funding Grants which was converted to an percentage X-Score.

Site Navigation »						
» <a href="#">Ag In The Classroom</a>						
» <a href="#">College Database</a>						
» <a href="#">College Data Summary</a>						
» <a href="#">Colleges &amp; Universities</a>						
» <a href="#">Course Outlines</a>						
» <a href="#">FFA Chapter Websites</a>						
» <a href="#">High School Ag Ed Is</a>						
» <a href="#">IFG Applications</a>						
» <a href="#">Online Ag Courses</a>						
» <a href="#">QI Summary-archived</a>						
» <a href="#">QI Summary-current</a>						
» <a href="#">Reports</a>						
» <a href="#">Search School/Teacher</a>						
<b>IFGA HOME</b>						
<b>INSTRUCTIONS</b>						
<b>DEADLINES</b>						
<b>FORMS</b>						
<b>REPORTS</b>						
Logged in as University						
<a href="#">change password</a>						
Choose Another Year						
2015 ▼						
<b>IFG Applications</b>						
<b>Senate District Report</b>						
Senate Dist	EFE	SEC	Dist	School District	FY 2015	
3	10	8	2	Gary Comer	0	
<b>Dist 3 - Mattie Hunter</b>						
5	10	8	2	John Marshall Metro	3,113	
<b>Dist 5 - Patricia Van Pelt</b>						
9	20	8	2	Glenbrook South	430	
<b>Dist 9 - Daniel Biss</b>						
14	65	8	2	Bremen	592	
<b>Dist 14 - Emil Jones, III</b>						
16	10	8	2	Southside Occupational Academy	0	
<b>Dist 16 - Jacqueline Y. Collins</b>						
17	10	8	2	Chicago Vocational Career Academy	4,732	
17	120	10	2	Manteno	1,667	
<b>Dist 17 - Donne E. Trotter</b>						
					<b>Total</b>	<b>6,399</b>
18	10	8	2	Chicago Ag Science	11,955	
<b>Dist 18 - Bill Cunningham</b>						

## APPENDIX C

## Sample of Incentive Funding Grant Application

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Illinois Agricultural Education

FY2018

High School Name		County	IAVAT Section #
District Name		Number	EFE System Name
Agricultural Education Teacher(s)		Telephone Number	

**A. QUALIFIED TEACHER (25 X Maximum)****Minimum Standards:**

- 0X 1. The agricultural education teacher(s) is licensed by the Illinois State Board of Education and possesses a minimum of 2000 hours of program-related work experience in the industry of agriculture with appropriate documentation on file.
- a. **Option 1:** The teacher(s) has a Professional Educator License (PEL) with a content endorsement for high school agricultural education.
- b. **Option 2:** The teacher(s) has a Educator License with Stipulations (ELS) with an endorsement as a Career and Technical Educator or a Provisional Career and Technical Educator in high school agricultural education.
2. The agricultural education teacher is an active member of the Illinois Association of Vocational Agricultural Teachers (IAVAT) and affiliated professional organizations with membership dues paid by October 31st.
- 3X a. **Option 1**  
 Illinois Association of Vocational Agriculture Teachers (IAVAT)  
 National Association of Agricultural Educators (NAAE)  
 Illinois Association for Career & Technical Education (IACTE)
- 1X b. **Option 2**  
 Association for Career & Technical Education (ACTE)
3. The agricultural education teacher(s) is employed to maintain year-round instructional programs and supervise students at summer activities, conferences, and fairs. The contract extension is **beyond the 185 day (9 month) legal school year**.
- 0X a. 9.0 month contract
- 1X b. 9.5 month contract
- 2X c. 10.0 month contract
- 3X d. 10.5 month contract
- 4X e. 11.0 month contract
- 5X f. 12.0 month contract
- 1X g. School employs two or more full time agricultural education teachers with at least two teachers employed in excess of 9 months.
4. The agricultural education teacher(s) assumed a current year leadership role in one or more of the following: (2x maximum - 1x for each)
- 0X a.  IAVAT Board
- b.  FFA Leadership Camp Staff
- c.  FFA Board
- d.  IAVAT Committee
- e.  IAVAT Section Officer
- f.  Hosted and/or organized an IAVAT/FFA CDE or Proficiency Awards

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5. The agricultural education teacher(s) participated in professional and technical development activities addressing the needs of the teacher(s) including the following:

**(Check all that apply)**

- 4X a. Annual Agricultural Education (IAVAT) Conference
- 1X b. District Summer Agricultural Education Teacher Workshops.
- 1X c. Participated in an Agricultural Education in-service activity other than IAVAT, 212 conferences, or district summer workshops.  
**Specify:** \_\_\_\_\_
- 1X d. 212 Conference - Teacher Inservice.
- 1X e. Teacher earned an industry-recognized credential that is taught and utilized in the program's curriculum. (i.e. OSHA 10, Pesticide Applicators, etc)
- 2X 6. The agricultural education teacher(s) has completed or is currently pursuing a master's degree in agriculture/agricultural education or education. **(Check all that apply – 2X maximum)**
- a.  Teacher is currently enrolled in a beginning agriculture teacher graduate course: Ag Ed 499. (2x)
- b.  Teacher has received a master's degree in agriculture/agricultural education/education. (2x)
- c.  Teacher is currently enrolled in an agriculture/agricultural education/education course. (1x)  
**Specify:** \_\_\_\_\_
- 0X 7. The agricultural education teacher(s) fosters the professional development of pre-service and beginning agriculture teachers. **(Check all that apply - 3X maximum)**
- a.  Cooperating teacher for a student teacher. (3x)
- b.  Mentor or Mentee. (1x)
- c.  Host teacher for early field experience or pre-service observation. (1x)

**Total X: Component A**

## B. STUDENT SERVICES (5 X Maximum)

### Minimum Standards:

- 0X 1. The agricultural teacher advises all agriculture students on a regular basis to help develop and meet individual career objectives. The teacher annually reviews the career information, scholarships, course offerings, and other pertinent information at [www.agriculturaleducation.org](http://www.agriculturaleducation.org) with the school guidance counselors.  
Counselor name and date of meeting  
\_\_\_\_\_
- 0X 2. The school district makes provisions to accommodate all Special Need students who wish to enroll in the agriculture program. The agriculture teacher is directly involved in development and/or implementation of the Individualized Education Program (IEP) for students enrolled in the agricultural program.
- 1X 3. Graduate survey of students who completed one or more agriculture courses during high school was submitted online by September 15.
- 1X 4. A current personal file or portfolio is maintained within the agriculture department for each student enrolled in the program. The file includes career objectives, planned sequence of courses, proposed SAEs, FFA goals, and other pertinent plans.
- 1X 5. Three or more students participated in a departmental sponsored agricultural college visitation OR hosted an agricultural college speaker.

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Specify: University/College \_\_\_\_\_ Date \_\_\_\_\_

Representative's Name \_\_\_\_\_

- 1X 6. Recruitment activities are conducted on an annual basis to attract students into the local agriculture program.

Specify activity: \_\_\_\_\_

- 1X 7. Students within the agriculture department participated in activities designed to expose students to agricultural careers such as Farm Progress Show, Elite conference, College Open Houses, Women in Ag conference, etc. (Does not include State or National FFA Career Shows).

Specify activity: \_\_\_\_\_

**Total X: Component B**

Must meet minimum standards to compute other scores.

**C. INSTRUCTIONAL PROGRAMS (28 X Maximum)****Minimum Standards:**

- 0X 1. The district offers a state-approved sequential program in agricultural education with a written course of study based on the Illinois Core Curriculum for Agricultural Education. The instructional program reflects a balance of classroom, laboratory, and supervised agricultural experiences with connections to industry based field experiences. Written lesson plans for all courses contain clearly stated goals, objectives, activities and experiences which relate to the district's School Improvement Plan.
- 0X 2. At least one course within the agricultural education program receives academic credit and the credit applies toward fulfilling high school graduation requirements in one or more of the following areas: **(Check all that apply: 4X Maximum - 2X for each)**
- |  |  |
|--|--|
| <input type="checkbox"/> a. Math           | <input type="checkbox"/> d. Language Arts      |
| <input type="checkbox"/> b. Science        | <input type="checkbox"/> e. Consumer Education |
| <input type="checkbox"/> c. Social Science |  |
- 0X 3. A minimum of one Group 2 Skill Course is taught in the current year in the following agricultural career pathways (a-e) **(2X Maximum - 1X for each)**
- |   |   |
|---|---|
| <input type="checkbox"/> a. Agricultural Science                  | <input type="checkbox"/> d. Horticulture                                  |
| <input type="checkbox"/> b. Agricultural Business and Management  | <input type="checkbox"/> e. Natural Resources and Conservation Management |
| <input type="checkbox"/> c. Agricultural Mechanics and Technology |   |
- 2X 4. A licensed agriculture education teacher(s) taught an ISBE approved 7th and/or 8th grade agriculture course(s) and FFA leadership instruction is an integral component of all course(s).
- 1X 5. The instructional program is articulated with respective post-secondary agricultural programs and it is documented through a **written program-specific articulation agreement.**
- 1X 6. At least one dual-credit agriculture course is taught in the current year. The students receives credit for that specific course at both the secondary and post-secondary level with a written agreement on file.
- Course Name:** \_\_\_\_\_
- 0-3X 7. Educational technologies are integrated into the agricultural classroom instruction.

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The following educational technologies are utilized in the classroom: **(Check all that apply: 3X Maximum - 1X for each)**

- 1X a. Up-to-date agriculture department/FFA chapter website
- 1X b. iPads or comparable tablets
- 1X c. Interactive classroom website such as a blog, wiki, edmodo, or edline
- 1X d. Mobile devices such as clicker or smartphones
- 1X e. Interactive whiteboards
- 1X f. Department created podcasts or other streaming media
- 1X g. Other new technologies (not including LCD Projectors)

**Specify:** \_\_\_\_\_

- 3X 8. The agricultural teacher(s) submitted a written Annual Department Report to appropriate local, regional, district and state officials within the current school year ending June 30. An oral presentation of the report and/or the written report is presented at a local board of education meeting.
- 0X 9. The school participated in Career Development Events(CDE) above the chapter level. **(Check all that apply: Max 8X - 1X for each)**
- |  |   |
|--|---|
| <input type="checkbox"/> a. Ag Business Management | <input type="checkbox"/> m. Job Interview           |
| <input type="checkbox"/> b. Ag Issues              | <input type="checkbox"/> n. Land Use                |
| <input type="checkbox"/> c. Ag Sales               | <input type="checkbox"/> o. Nursery Landscape       |
| <input type="checkbox"/> d. Agronomy               | <input type="checkbox"/> p. Livestock Judging       |
| <input type="checkbox"/> e. Dairy Judging          | <input type="checkbox"/> q. Meat Science            |
| <input type="checkbox"/> f. Milk Products          | <input type="checkbox"/> r. Ag Mechanics            |
| <input type="checkbox"/> g. Envirothon             | <input type="checkbox"/> s. Parliamentary Procedure |
| <input type="checkbox"/> h. Floriculture           | <input type="checkbox"/> t. Poultry                 |
| <input type="checkbox"/> i. Food Science           | <input type="checkbox"/> u. Public Speaking         |
| <input type="checkbox"/> j. Forestry               | <input type="checkbox"/> v. Quiz Bowl               |
| <input type="checkbox"/> k. Horse Judging          | <input type="checkbox"/> w. Ag Communications       |
| <input type="checkbox"/> l. Horticulture           | <input type="checkbox"/> x. Veterinary Science      |
|  | <input type="checkbox"/> y. Dairy Handlers          |

10. MyCAERT.com - the teacher uses the online instructional resources such as E-units, PowerPoints, lesson plans, and assessments (such as CSAT) to support classroom instruction. **(2X Maximum)**

- 1X a.  Use and access by teacher only
- 2X b.  Use and access by students and teacher.

11. **Credentials are earned within the agricultural education program.**

- 1X a. Instructor (Instructor is credentialed to provide/bestow credentials to students)

**Name of Credential:** \_\_\_\_\_

- 1X b. Student

**Name of Credential:** \_\_\_\_\_

**Total X: Component C**

Must meet minimum standards to compute other scores.

#### D. SUPERVISED AGRICULTURAL EXPERIENCE PROGRAMS (SAEP) (16 X Maximum)

##### Minimum Standards:

- 0X 1. Instruction on conducting SAEs and maintaining records is an integral component of instruction for all students as verified in written lesson plans for all courses.

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- a. Incorporated into the related course grade.
- b. Awarded as a separate SAE course for credit (i.e. .25, .5, or 1 unit of credit) with a grade given which shows on the report card.
- c. Both a & b.

- 3X 2. ALL students have a Supervised Agricultural Experience (SAE) project. The experiences are documented with accurate and up-to-date records and are evaluated on a regular basis.
- 3. The agriculture teacher conducts or supervises observations of agricultural student SAEs with written documentation of the visit on file. The visit must be conducted at the students' place of employment, residence, or location of project.
- 1X a. 10-45% of agricultural education students are visited.
- 2X b. 46-75% of agricultural education students visited.
- 3X c. 76-100% of agricultural education students visited.
- 4. Proficiency Award participation above the chapter level: (up to 4X; check a or b; check c and d)
- 1X a. 1-5 students participated at the section level.
- 2X b. 6+ students participated at the section level.
- 1X c. Student(s) participated at the district level.
- 1X d. Student(s) participated at the state level.
- 1X 5. Three(3) or more students exhibited SAEPs at the Section Agricultural Education Fair sponsored by the Illinois Department of Agriculture, sanctioned by ISBE and coordinated by IAVAT. The agriculture education teacher supervised the students as well as cooperated in conducting the activities of the fair.
- 2X 6. One or more students earned their State FFA Degree
- 2X 7. One or more students earned their American FFA Degree

**Total X: Component D**

Must meet minimum standards to compute other scores.

**E. AGRICULTURAL STUDENT ORGANIZATIONS (FFA) (26 X Maximum)****Minimum Standards:**

- 0X 1. The FFA leadership component is incorporated into the curriculum through an annual written Program of Activities (POA). **A preliminary POA has been submitted to the Illinois FFA Center by November 30.**
- 0X 2. The advisor(s) of the FFA Chapter is currently employed as an agriculture teacher by the district and the FFA Chapter has submitted an online roster, certification form, and membership dues by the deadline of November 1st
- 4X 3. FFA Members are involved in the planning and implementation of a Program of Activities. A written completed POA is **on file in the department** and Form I and II of the National Chapter Award Program have been **sent to the Illinois FFA Center** emailed to Mindy Bunselmeyer by midnight on April 15 for state competition. Credit will be granted to applications receiving the bronze emblem award (or higher) for each category of Form II.
- 1X 4. Leadership development instruction is provided to all students in all

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agricultural courses through planned FFA activities which are integral to all courses. **Each student participated in at least three FFA leadership activities at or above the chapter level such as but not limited to chapter meetings, committee meetings, CDE's, leadership conferences.**

- 1X 5. The FFA Chapter constitution and/or bylaws are up-to-date and reviewed annually with a written copy on file .
- 1X 6. The FFA Chapter conducts and can document twelve regularly scheduled chapter meetings per year.
7. The FFA Chapter actively participates in the annual FFA convention:  
**(Check all that apply)**
- 3X a. State FFA Convention
- 2X b. National FFA Convention
- 2X 8. The agricultural program is supported by an active FFA Alumni affiliate. The Alumni affiliate must be in good standing by May 1st.
- 1X 9. The FFA Chapter plans and conducts an annual member recognition banquet/program.
- 1-2X 10. One or more FFA members represented the local chapter in the following state and/or national FFA leadership activities: **(Check all that apply - 1X per activity - 2X maximum)**
- |  |   |
|--|---|
| <input type="checkbox"/> a. 212 or 360 Conference        | <input type="checkbox"/> d. Leadership Conference |
| <input type="checkbox"/> b. FFA Leadership Camp          | <input type="checkbox"/> e. Ag Legislative Day    |
| <input type="checkbox"/> c. Farm Bureau Youth Conference | <input type="checkbox"/> f. STAR Conference       |
11. The FFA Chapter has identified a local chapter representative to the Illinois Foundation FFA **and** promoted community contributions to the annual foundation campaign for state sponsored leadership activities. The level of support was:
- 1X a. \$750 - \$1099
- 2X b. \$1100 - \$1499
- 3X c. \$1500+

**Specify the local chapter representative:**

- X 12. The FFA chapter completed Illinois Farm Bureau's Youth Education in Agriculture applications by the due date. (1X Each - Max 2x)
- a. Cooperative Activities Program Participant (Form I and II)
- b. Heritage Program Participant (Form I and II)
- 2X 13. The FFA Chapter received the Century Challenge Award for 100% FFA membership.
- 1X 14. The Chapter includes active FFA Discovery (7th - 8th grade) members and a copy of the 7th and/or 8th grade agriculture course outline(s) has been submitted to and approved by ISBE as required by FFA policy.
- 1X 15. An administrator, counselor or board member from the school attended the State FFA Convention or the National FFA Convention during the school year.

**Specify Name of Individual Attending:**

<b>Total X: Component E</b>
-----------------------------

Must meet minimum standards to compute other scores.

### F. FACILITIES, EQUIPMENT AND SUPPLIES (8 X Maximum)

#### Minimum Standards:

- 0X 1. The school district provides adequate classroom and laboratory space which is maintained in a safe, orderly and attractive condition. Appropriate equipment and adequate storage space are available for the courses offered.
- X 2. School facilities designated specifically for agricultural education include the following: **(Check all that apply. 5X Max)**
- |   |   |
|---|---|
| <input type="checkbox"/> a. Plant (land/crop) | <input type="checkbox"/> g. Landscape                       |
| <input type="checkbox"/> b. Animal (large)    | <input type="checkbox"/> h. Agriscience                     |
| <input type="checkbox"/> c. Mechanics         | <input type="checkbox"/> i. Computers/Tablets (at least 10) |
| <input type="checkbox"/> d. Greenhouse        | <input type="checkbox"/> j. Plant Nursery                   |
| <input type="checkbox"/> e. Aquaculture       | <input type="checkbox"/> k. Garden                          |
| <input type="checkbox"/> f. Animal (small)    | <input type="checkbox"/> l. Other Specify:                  |
- 1X 3. A current written inventory of department tools, equipment and other pertinent material is on file in the Department. It includes modern tools and equipment comparable to those used in the agricultural industry and based on the largest number of students using the facilities. **The inventory specifically identifies items purchased with agricultural education incentive funds.**
- 1X 4. A departmental budget is prepared by the agricultural teacher(s) and is submitted to administration for approval. The budget request identifies needs for equipment, facilities, supplies, travel, and other program necessities.
- 1X 5. The agricultural education department successfully obtained external grant resources exceeding \$500. DOES NOT include Incentive Funding Grant, Perkins or CTEI grant funding.
- Specify Grant Source(s) \_\_\_\_\_ Total Value \_\_\_\_\_**

#### Total X: Component F

Must meet minimum standards to compute other scores.

### G. AGRICULTURAL ADVISORY COUNCIL (8 X Maximum)

#### Minimum Standards:

- 0X 1. An officially approved agricultural advisory council, whose membership is representative of the agricultural industry within the community, met at least one time during the school year to provide program advisement to the district. Council membership lists and minutes are **on file** in the agriculture department.
- 2X 2. The agricultural advisory council met two or more times per year and the meeting minutes are kept on file in the agriculture department.
3. The advisory council conducted a review and/or considered recommendations from the teacher(s) or administration as documented in published minutes including, but not limited to the following: **(Check all that apply - 5X Max)**

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- 1X Curriculum improvement/expansion (Specify): \_\_\_\_\_
- 1X Teacher professional development (Specify): \_\_\_\_\_
- 1X Facilities, equipment and supplies (Specify): \_\_\_\_\_
- 1X Student SAEs and FFA Chapter Program of Activities (Specify): \_\_\_\_\_
- 1X Adult agricultural education (Specify): \_\_\_\_\_
- 1X Agricultural awareness (literacy) pre-K/adult (Specify): \_\_\_\_\_
- 1X Review the completed Incentive Funding Grant application (Specify): \_\_\_\_\_
- 1X 4. An administrator and/or school board member attended at least one advisory council meeting.

	<b>Total X: Component G</b> Must meet minimum standards to compute other scores.
--	---

**H. PreK-ADULT AGRICULTURAL EDUCATION AWARENESS PROGRAMS**

(6 X Maximum)

	<b>Minimum Standards:</b> <input type="checkbox"/> 0X 1. The agricultural education teacher(s) assists in the coordination of agricultural awareness/literacy activities, PreK-adult.
--	--

- X 2. Activities were conducted by the agricultural education department to enhance student awareness and career exploration about agriculture. (Max 5X)
  - a. Agricultural Career Fair
  - b. Job Shadowing Experiences
  - c. FFA Week Activities
  - d. Demonstrated AgriScience/mAGic Kit Activities
  - e. Ag Day/Week or Ag Expo Activities Specify: \_\_\_\_\_
  - f. Food for America Activities
  - g. Partners in Active Learning Support (PALS) Activities
  - h. Teaching Agricultural Safety to Kids (TASK) Activities or Farm Safety for Just Kids Activities
- 1X 3.  The agriculture teacher(s) coordinated and/or taught a workshop or classes in and/or about agriculture which were specifically designed for adults in your community.

**Specify class titles:** \_\_\_\_\_

**Total # of participants:** \_\_\_\_\_

	<b>Total X: Component H</b> Must meet minimum standards to compute other scores.
--	---

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<b>APPLICATION FOR INCENTIVE FUNDING SUMMARY</b>		
QUALITY INDICATORS	"X-VALUE" MAXIMUM	"X-VALUE" ACHIEVED
A. Qualified Teachers	25 X	
B. Student Services	5 X	
C. Instructional Programs	28 X	
D. SAEP	15 X	
E. FFA	26 X	
F. Facilities, Equipment, and Supplies	8 X	
G. Agricultural Advisory Council	8 X	
H. K-Adult Agricultural Education Awareness Programs	6 X	
<b>Totals</b>	<b>121 X Maximum</b>	

**PROGRAM ASSURANCES**

*By clicking the "Finalize and Submit" button assurance is being made that the program information contained in this application is accurate and can be documented for audit purposes. Misrepresentation of the program will result in ineligibility for funding.*

## APPENDIX - D

Summary sheets that were data mined for school's names achieving quality indicators.

www.agriculturaleducati: x

www.agriculturaleducation.org/linkpages/ifga/SummaryReport.asp?Report=7

**2017-2018 Summary of Agricultural Education Quality Indicators - 332 Schools** [Back to Ind](#)

A Qualified Teachers Total Schools: 56 Percent of Departments Achieving: 17%

A3b 9.5 month contract

District I	District II	District III	District IV	District V
5/58 9%	7/67 10%	13/65 20%	8/63 13%	23/79 29%
Chadwick-Milledgeville Pecatonica Prophetstown Sherrard West Carroll	Chicago Vocational Career Academy Glenbrook South Lexington Lincoln-Way East Oswego Ottawa Ray Graham Training Center	Bluffs Brown County Carrollton Havana Mt. Pulaski New Berlin North Mac Northwestern-Palmyra Payson-Seymour Pleasant Hill Quincy Staunton Virginia	Casey-Westfield Chrisman Edinburg Maroa-Forsyth Mulberry Grove Ramsey Shelbyville Shiloh	Belleville West Benton Bluford Cahokia Carbondale Carmi Central at Breese Centralia Elverado Galatia Harrisburg Joppa Mascootah Meridian-Mounds Norris City-Omaha-Enfield Odin Patoka Sesser-Valier Sparta Steeleville Trico Vienna Woodlawn

## Appendix E

Excel templates used to convert data mined material to binary code for SPSS.

<b>District</b>	<b>Section</b>	<b>School Name</b>	<b>A3e 11.0 month contract</b>	<b>Year</b>
I	4	Abingdon-Avon	0	2016-2017
I	3	Alwood	0	2016-2017
I	2	Amboy	0	2016-2017
I	3	Annawan	0	2016-2017
		Ashton-Franklin		
I	2	Center	1	2016-2017
I	5	Brimfield	0	2016-2017
I	3	Bureau Valley	0	2016-2017
I	2	Byron	0	2016-2017
I	3	Cambridge	0	2016-2017
		Chadwick-		
I	2	Milledgeville	0	2016-2017
I	1	Dakota	0	2016-2017
I		Dunlap	0	2016-2017
I	1	Eastland	0	2016-2017
I	5	Elmwood	0	2016-2017
I	5	Eureka	0	2016-2017
I	5	Fieldcrest	0	2016-2017
I	1	Forreston	1	2016-2017
I	1	Freeport	0	2016-2017
I		Galena	0	2016-2017
I	4	Galesburg	0	2016-2017
I	3	Galva	0	2016-2017
I	3	Geneseo	0	2016-2017
I	3	Kewanee	0	2016-2017
I	4	Knoxville	0	2016-2017
I	2	La Moille	0	2016-2017
I	1	Lena-Winslow	0	2016-2017
I	4	Mercer County	0	2016-2017
I	5	Metamora	0	2016-2017
I	5	Midland	0	2016-2017
		Monmouth-		
I	4	Roseville	1	2016-2017
I	1	Orangeville	0	2016-2017
I	2	Oregon	1	2016-2017
I	3	Orion	0	2016-2017
I	1	Pearl City	1	2016-2017
I	1	Pecatonica	0	2016-2017
I	2	Polo	0	2016-2017
I	3	Princeton	0	2016-2017
I	5	Princeville	0	2016-2017
I	2	Prophetstown	0	2016-2017

## APPENDIX – F

## SPSS Data File

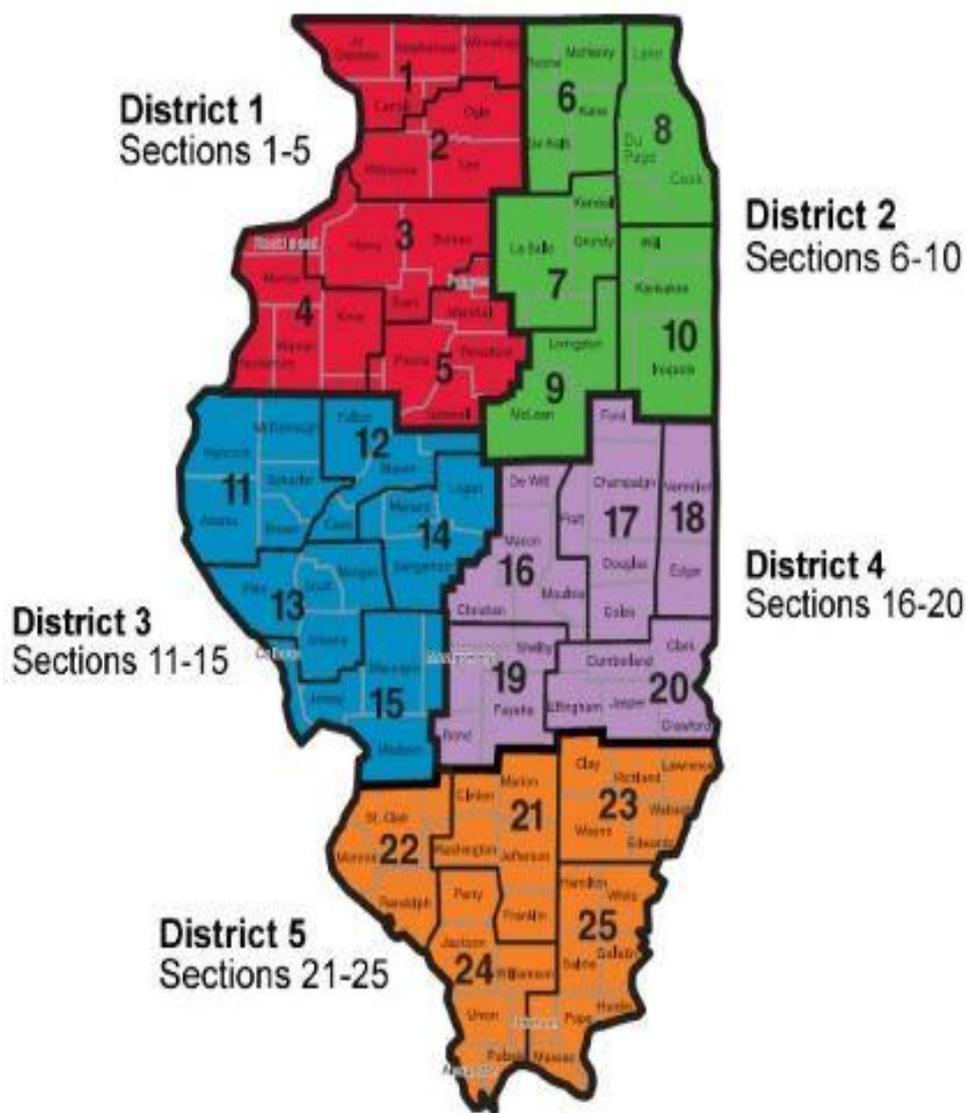
comprehensive14.183.7.18vertical.sav [DataSet1] - IBM SPSS Statistics Data Editor

File Edit View Data Transform Analyze Graphs Utilities Extensions Window Help

	FiscalYear	Percentage	School	Section	District	Gender	A1a	A1b	A3a
1	2014	.4933	Dakota		1 I	1	0	1	
2	2014	.1588	Earville		7 II	1	0	0	
3	2014	.1974	IL School for Vis...		13 III	1	0	0	
4	2014	.2500	Salt Fork- Jamai...		18 IV	2	0	0	
5	2014	.4605	Elverado		24 V	2	0	0	
6	2014	.3552	Orangeville		1 I	1	0	1	
7	2014	.0721	La Moille		2 I	2	0	1	
8	2014	.2105	Paw Paw		2 I	1	0	1	
9	2014	.4997	Wethersfield		3 I	2	0	1	
10	2014	.6379	Rockridge		4 I	2	0	1	
11	2014	.3618	Chicago Vocatio...		8 II	1	0	1	
12	2014	.1974	John Marshall M...		8 II	1	0	1	
13	2014	.2237	Normal University		8 II	2	0	1	
14	2014	.1447	Southside Occup...		8 II	1	0	1	
15	2014	.4142	Greenfield		13 III	1	0	1	
16	2014	.4142	Pleasant Plains		14 III	2	0	1	
17	2014	.4079	Northwestern-Pal...		15 III	2	0	1	
18	2014	.4736	Okaw Valley		16 IV	1	0	1	
19	2014	.3091	Sangamon Valley		16 IV	2	0	1	
20	2014	.3355	Rantoul		17 IV	4	0	1	
21	2014	.0789	Catlin		18 IV	1	0	1	
22	2014	.5064	Kansas		18 IV	1	0	1	
23	2014	.7233	Shiloh		18 IV	1	0	1	

Data View Variable View

Appendix G  
Illinois Agriculture Education Section and District Map



## VITA

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Dissertation Title:

THE SHORTAGE OF LICENSED SECONDARY AGRICULTURE INSTRUCTORS IN  
ILLINOIS: AN EXAMINATION OF THE IMPACT ON SECONDARY  
AGRICULTURAL EDUCATION PROGRAM QUALITY

Major Professor: Seburn L. Pense