LEVEL OF INFLUENCE OF SELECTED FACTORS UPON MISSOURI AGRICULTURAL EDUCATION TEACHERS' CHOICE TO INSTRUCT AGRICULTURAL MECHANICS CURRICULUM

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Doctor of Philosophy

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by

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MAY, 2010

The undersigned, appointed by the Dean of the Graduate School, have examined the dissertation entitled:

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A candidate for the degree Doctor of Philosophy

And hereby certify that in their opinion it is worthy of acceptance.

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DEDICATION

This work is dedicated to all the special people in my life who have loved me, supported me, mentored me, and helped me become a better person. Thank you all.

Mom, without your constant support and love, there is no way that I could have completed this process. Words cannot express my appreciation and love for you. Thank you so much for everything.

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LEVEL OF INFLUENCE OF SELECTED FACTORS UPON MISSOURI AGRICULTURAL EDUCATION TEACHERS' CHOICE TO INSTRUCT AGRICULTURAL MECHANICS CURRICULUM

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ABSTRACT

The purpose of this study was to determine the factors influencing school-based agricultural educators in Missouri to instruct the curriculum found within the course Agricultural Construction 1 and/or Agricultural Construction 2. The Missouri Agricultural Mechanics Assessment was distributed via e-mail to all teachers who instructed Agricultural Construction 1 and/or Agricultural Construction 2, during the 2009-2010 academic school year (N = 257). A total of 203 (79%) teachers completed the instrument. *Personal Importance* was the most influential factor impacting their decision to teach the agricultural mechanics curriculum areas: Arc Welding, Project Construction, Oxy-Gas and Other Cutting/Welding Processes, Woodworking, Metals, and Finishing. *Administration Importance* was the least influential factor influencing Missouri agriculture teachers to instruct the agricultural mechanics curriculum areas. Overall, negligible to small relationships were found between teacher characteristics and the summated variables: Importance to Teach and Teacher Self-Efficacy, based upon teaching the curriculum areas.

CHAPTER ONE

INTRODUCTION

This chapter begins with a discussion of the background and setting that provide the context of the problem statement for this research. The purpose and objectives of the research are presented along with the need for the study and the theoretical frameworks upon which the study is based. Finally, definitions of terms, limitations, and assumptions of the study are provided.

Background and Setting

Teacher Beliefs and Curriculum Implementation

Instructional practices, which are implemented in the classroom and laboratory, are somewhat based on how teachers choose to teach the curriculum content with the resources allocated to them and within the schools' learning environment (Knobloch, 2008). The predetermined beliefs of teachers often influence how they connect academic content in the classroom to real-life applications in the laboratory or community (Knobloch, 2008). Frequently, these beliefs are developed in part to personal beliefs about the curriculum or content (Borko & Putnam, 1996; Moseley, Reinke, & Bookout, 2002; Pajares, 1992); availability of time, availability instructional resources, level of preparation regarding the content (Thompson & Balschweid, 1999), comfort level with the content, (Knobloch & Ball, 2003), perceived value of the content (Lawrenz, 1985), past experiences with the content area (Calderhead, 1996; Thompson & Balschweid, 1999), teaching environment (Knoblock, 2001) and motivation (Bandura, 1997; Tschannen – Moran, Woolfolk-Hoy, & Hoy, 1998). The development and performance of teachers is also influenced by the interaction of these personal and environmental factors and the situations in which they teach (Knobloch, 2001). If teacher educators can understand the factors that influence teachers' decisions to instruct various aspects of the agricultural mechanics curriculum, can we then help shape a more fruitful environment for student academic mastery and teacher performance?

Professional development of agriculture teachers.

Today, school-based agricultural educators face a plethora of challenges both within and beyond the classroom. Educators are expected to provide a positive learning environment for students, prepare students for productive lives in a fast-paced world, and incorporate other subject area curriculum into their own subject matter (Layfield & Dobbins, 2002). More specifically, some leaders in the field expect agricultural educators to integrate concepts from science, reading, and mathematics into the courses they teach (Washburn & Dyer, 2006). The constant evolution of agricultural education programs and the addition of core subject content skills have motivated many teachers to seek professional development opportunities to meet the demands of the changing emphasis of their programs (Washburn & Dyer). Several researchers have pointed out that agricultural educators are in constant need of professional development in order to maintain and improve their teaching skills, effectively carry out their professional duties, and meet the demands of a changing educational environment (Barrick, Ladewig, & Hedges, 1983; Birkenholz & Harbstreit, 1987; Nesbitt & Mundt, 1993; Washburn, King, Garton & Harbstreit, 2001).

Goodlad (1983) stated that the teacher is the single most important variable in determining school effectiveness. To maintain an effective teaching force requires the regular introduction of highly qualified entry-phase teachers and that practicing teachers be kept abreast of changes in the profession (Anderson, Barrick, & Hughes, 1992). To keep these teachers abreast of changing technology, policies, and curriculum improvements, teachers must develop and improve their skills, pedagogically and technically, through high quality professional development programs (Anderson, Barrick, & Hughes.) According to Niven (1993) professional development is a necessity to provide agriculture teachers the knowledge and skills needed to successfully meet the demands of a changing educational environment and advances in technology.

Professional development opportunities for teachers typically include pre-service programs which are generally taken prior to entry into the teaching field, or the issuance of a teaching certificate, and in-service programs, which are generally taken after entry into the field of education (Anderson, 1989). A National Center for Research in Vocational Education study identified eight components of a comprehensive professional development program for vocational teachers (Hamilton, 1985). These components consisted of: pre-service programs for individuals entering teaching without an undergraduate education degree - alternative certification program; supervision of first and second year vocational teachers - inductee program; pedagogy updates; technology updates; professional information updates; research practices update; teacher technical skills updates and testing, i.e.: agricultural mechanics skills; and curriculum updates and programs.

Agricultural mechanics instruction in school-based agricultural education programs.

A significant portion of the instructional time in school-based agricultural education is dedicated to the area of agricultural mechanics. According to Shinn (1987), approximately one-third to two-thirds of a teachers' instructional time is devoted to agricultural mechanics laboratory instruction. Phipps and Osborne (1988) estimated that in many courses, the time allocated for instruction in agricultural mechanics comprises 25% to 40% of a teacher's total instructional time. In a 1989 study of Missouri school-based agricultural educators, Johnson determined that these teachers devoted about 40% of their instructional time to teaching agricultural mechanics. Luft (1989) conducted a study similar to Johnson's in North Dakota and determined that school-based agriculture teachers there spent approximately 44% of the available class time toward the instruction of agricultural mechanics. Hoerner and Beckum (1990) reported that agriculture teachers from seven selected states taught an average of two agricultural mechanics classes per semester. Saucier, Schumacher, Terry, Funkenbusch, and Johnson (2008) found that

Missouri agricultural educators spent an average of 10 hours per week instructing agricultural mechanics curriculum in a laboratory environment.

Agricultural educators spend a significant amount of instructional time teaching agricultural mechanics in a laboratory environment (Shinn, 1987; Phipps and Osborne, 1988; Johnson, 1989; Luft 1989; Hoerner & Beckum, 1990; Saucier, Schumacher, Terry, Funkenbusch, & Johnson, 2008). Moreover, certain aspects of teaching the curriculum have inherent safety considerations for both students and the instructor (Fletcher & Miller; 1995; Johnson, Schumacher, & Stewart, 1990; Saucier, Terry, & Schumacher, 2009; Schlautman & Silletto, 1992). Therefore, professional development for agricultural educators is a priority if a high level of teaching and learning is to be maintained (Garton & Chung, 1995). Needs assessments should be conducted at regular intervals to accurately reflect the changing needs of teachers, students, and the agriculture, food, fiber, and natural resource industry (Caffarella, 1982). Birkenholz and Harbstreit (1987) stated that in-service providers should "periodically monitor the needs of teachers as they change over time and provide assistance based upon current needs" (p. 48). Furthermore, Garton and Chung (1995) recommended that "research is needed to assess the in-service needs of today's agriculture teachers" (p. 78).

Agricultural mechanics professional development.

One of the most important areas for professional development for agricultural educators is agricultural mechanics (Saucier, Tummons, Terry, & Schumacher, 2010). In fact, agricultural mechanics is considered a very important part of the total agricultural education program in most schools (Phipps, 1983). Furthermore, Hubert and Leising (2000) stated that “agricultural mechanics instruction is an important component of school-based agricultural education programs in the U.S.” (p. 25). According to Kotrlik and Drueckhammer (1987), agricultural mechanics and supervised occupational experience, now known as SAE, programs were the two most important components in ensuring quality school-based agricultural education programs in the future. Rosencrans and Martin (1997) found that nearly 70% of the school-based agricultural education teachers who participated in their study believed that stand alone agricultural mechanics courses were critical components of agricultural education programs. Moreover, Burris, Robinson, and Terry (2005) stated that as state education agencies continue to dedicate a large portion of their school-based agricultural education curriculum to agricultural mechanics, so should teacher preparation institutions continue to dedicate part of their degree programs to developing teacher competencies in these areas.

In a study of pre-service teachers, Foster (1986) reported high levels of anxiety associated with the teaching of agricultural mechanics prior to, and during, student teaching. In a national study, Burris, Robinson, and Terry (2005) found that teacher educators identified agricultural mechanics as a vital part of school-based agricultural programs. This group rated the level of preparation of program graduates, in the area of agricultural mechanics, lower than their level of importance of competencies in that area. The discrepancy between the importance and the graduates’ level of preparation underscores the fact that teacher educators must continue to include agricultural mechanics in their teacher preparation programs. This perception of agricultural mechanics further implicates the need for adequate preparation of pre-service teachers in agricultural mechanics. Burris et al. (2005) further stated that pre-service teachers would benefit from programs that offer experiences in a wide range of agricultural mechanics content areas. This finding was in agreement with Hubert and Leising (2000) who stated that for agriculture teachers to do the best job possible teaching agricultural mechanics they need to receive current and technically correct pre-service agricultural mechanics instruction.

The need for additional education in the specialized area of agricultural mechanics is not limited to pre-service teachers. Results of numerous studies have indicated the need for professional development for existing agricultural educators in the area of agricultural mechanics (Edwards & Briers, 1999; Garton & Chung, 1995; Johnson, Schumacher, & Stewart, 1990; Roberts & Dyer, 2004; Saucier, Terry, & Schumacher, 2009; Washburn, King, Garton, & Harbstreit, 2001). In 1999, Edwards and Briers conducted a study of entry-phase school-based agricultural educators in Texas. The researchers found that these teachers had in-service needs in the area of agricultural mechanics. More specifically, these agricultural educators had in-service needs in the areas of integrating Computer Aided Drafting (CAD) into agricultural mechanics and planning laboratory facilities for integrated courses such as physics with agricultural mechanics. In a 2001 study of Kansas and Missouri school-based agricultural educators, researchers found that teachers with 15 years of experience or less had professional development education needs in agricultural mechanics project construction (Washburn, King, Garton, & Harbstreit, 2001). Roberts and Dyer (2004) found that both alternatively and traditionally certified agricultural educators in Florida had professional development needs in the following areas of agricultural mechanics: small engine technology, large and small agricultural mechanics construction, metal fabrication techniques, tool and equipment repair, electricity, and Global Positioning Systems (GPS).

Theoretical Framework

Ajzen and Fishbein's Theory of Planned Behavior

The Theory of Planned Behavior is an extension of the Theory of Reasoned Action (Ajzen & Fishbein, 1980; Fishbein & Ajzen, 1975). This theory was developed due to the limitations in the original theory regarding behaviors over which people have incomplete volitional control. A central factor in this theory is an individual's intention to perform a given behavior (Azjen, 1991). "Intentions are assumed to capture the motivational factors that influence a behavior; they are indications of how hard people are willing to try, of how much of an effort they are planning to exert in order to perform the behavior" (Azjen, 1991). As a general rule, the stronger a person's intention to engage in a behavior, the more likely they will have a stronger performance in that behavior. The theory further indentifies non-motivational factors that can be used to determine a person's performance at a given behavior. These non-motivational factors can include the availability of requisite opportunities and resources such as: time, money, personal skill level, and cooperation of others (Azjen, 1991). Collectively, motivational and non-motivational factors represent a person's actual control over a behavior. Furthermore, the theory states that if a person has the required opportunities and resources, and intends to perform the behavior, the person should succeed in their behavior.

Expectancy-Value Theory of Achievement Motivation

The Expectancy-Value Theory has been used to understand the motivations that trigger individuals' behaviors and is one of the major frameworks for achievement motivation (Atkinson, 1957). The theory proposes that if one can identify the factor, or factors that impact an individual's intention, then an individual's behavior can then be predicted. Atkinson further stated that achievement behaviors represent a conflict between approach (hope for success) and avoidance (fear of failure) tendencies. The basis of this theory is that individuals choose behaviors based on the outcomes they expect and the values to which they ascribe (Borders, Earlywine, & Hewey, 2004). In the formulation of expectancy-value theory, values and ability beliefs, or expectancies for success, are the most important motivations that predict behaviors (Eccles, Adler, Futterman, Gof, Kaczala, & Meece, 1983)

Bandura's Theory of Self-Efficacy

Bandura's Theory of Self-Efficacy has its theoretical roots in Bandura's Social Cognitive Theory. According to Bandura (1997), self-efficacy is defined as the "beliefs in one's capabilities to organize and execute the course of action required to produce given attainments" (p. 3). Moreover, self-efficacy influences a person's choices, actions, the amount of effort they give, how long they persevere when faced with obstacles, their resilience, their thought patterns and emotional reactions, and the level of achievement they ultimately attain (Bandura, 1986). Gist and Mitchell (1992) found that some differences in self-efficacy may be associated to the skill level of the subject; however, differences in personality, motivation, and the task itself may also influence efficacy perceptions. Furthermore, self-efficacy is a belief about what one is capable of doing; however, it is not the same concept as knowing what to do (Schunk, 2004).

Statement of the Problem

Understanding the factors that influence teachers' decisions to instruct certain aspects of curriculum is an important component of tailoring pre-service and professional development education to meet teachers' ever-changing educational needs. Due to the current lack of research regarding the factors that influence school-based agriculture teachers to instruct agricultural mechanics course curriculum, the continual need to determine the professional development needs of agriculture educators, and the lack of research in the area of school-based agricultural mechanics, the researcher determined that this study is timely and warranted. Therefore, the study sought to answer the following research questions:

1. What factors influence school-based agriculture teachers to instruct the competencies found with the Agricultural Construction 1 and/or Agricultural Construction 2 Missouri curriculum?

2. What professional development education opportunities can be developed based upon the teachers' evaluation of these influential factors?

Purpose of the Study

The purpose of this study was to describe the factors that influence Missouri school-based agriculture teachers' choice to teach specific components of the Agricultural Construction 1 and/or Agricultural Construction 2 curriculum.

Research Questions

The following research questions were developed to guide this study:

1. What are the personal, professional, and program characteristics (age, sex, years of teaching experience, type of teacher certification, university semester credit hours earned in agricultural mechanics, student enrollment in a school-based agricultural education program , time spent supervising student agricultural mechanics Supervised Agricultural Experience (SAE) projects per week, student participation in agricultural mechanics related events, university from which undergraduate degree was earned, FFA area in which school of

employment is located, and satisfaction with the teacher education program from which certification was earned regarding preparation to teach agricultural mechanics) of school-based agricultural educators in Missouri who teach Agricultural Construction 1 and/or Agricultural Construction 2?

2. Which of the selected components of the Agricultural Construction 1 and/or Agricultural Construction 2 curriculum do Missouri school-based agricultural educators teach?

3. What factors influence Missouri school-based agricultural educators' decisions to teach selected curriculum components in Agricultural Construction 1 and/or Agricultural Construction 2?

4. Does a relationship exist between and among teachers' choice to teach selected components of the Agricultural Construction 1 and/or Agricultural Construction 2 curriculum, the self-perceived factors that influence teachers decision to teach selected components of the Agricultural Construction 1 and/or Agricultural Construction 2 curriculum, and their personal, professional, and program characteristics (age, sex, years of teaching experience, university semester credit hours earned in agricultural mechanics, student enrollment in a school-based agricultural education program, type of teacher certification, and time spent supervising student agricultural mechanics SAE projects per week)?

Definition of Terms

For the purposes of this study, the following terms were defined:

Agricultural Education – the agricultural education program is built on three core areas of classroom/laboratory instruction, supervised agricultural experience programs, and FFA student organization activities and opportunities. Agricultural education prepares students for successful careers and a lifetime of informed choices in the global agriculture, food, fiber and natural resources systems. (National FFA Organization, 2006)

Agricultural Mechanics – the selection, operation, maintenance, servicing, selling, and use of power units, machinery, equipment, structures, and utilities used in agriculture (Herren, 2006).

Alternative teacher certification – a non-traditional route into the teaching profession. This includes all levels of certifications from emergency certification to well-designed programs that address the professional development preparation needs of the growing population of individuals who already have a baccalaureate degree and considerable life experience and who want to become teachers (Feistritzer and Chester, 2000; Ruhland & Bremer, 2002b).

Attitude - an individual's positive or negative feeling associated with performing a particular behavior (Fishbein & Ajzen, 1975).

- a cognition (thought) that is learned through experience and influences a person's behavior; comprised of (relevant) belief/value pairs (Benoit, 2010).

Attitude toward behavior - the attitudinal component of the Theory of Reasoned Action (Benoit, 2010).

Beginning teacher – a teacher of agriculture with less than two years of teaching experience (Lamberth, 1982).

Behavioral intent - how our attitudes and norms would lead us to behave (Benoit, 2010).

Belief - a statement of fact, potentially verifiable (Benoit, 2010).

Belief strength - likelihood that an attitude is true (Benoit, 2010).

Competence – the degree, or level of, competency possessed by an individual (Lamberth, 1982).

Competency – behavioral characteristics of knowledge, skills, attitudes, and judgment generally required for the successful performance of a task (Lamberth, 1982).

Competency – based on teacher education – A system of teacher education which has as its specific purpose the development of specifically described knowledge, skills, and behaviors that will enable a teacher to meet performance criteria for classroom teaching (Lamberth, 1982).

Emergency teacher certification – an alternative teacher certification process that ignores training in professional studies and carries the expectation that the teacher will obtain the necessary credentials, or will eventually be replaced by a regularly certified person. (Lazko-Kerr & Berliner, 2002).

Evaluation - favorability or unfavorability of an attitude (Benoit, 2010).

Expectancy-Value Theory - states that attitude are developed and modified based on assessments about beliefs and values (Fishbein & Ajzen, 1975) and in relation to this study, expectations of success and the value of the job are major determinants of motivation for academic choices (Watt & Richardson, 2007).

Importance – importance of the topic to the instructors' job function (Barrick, Ladewig, & Hedges, 1983).

Intent – the act or fact of intending (Merriam-Webster, 2010).

Level of Self-Efficacy – defined as a person's general belief that certain behavior can bring about a desired outcome, and that the individual possesses the necessary skill or ability to bring about a desired outcome (Bandura, 1986).

Motivation to comply - how much (or how little) we want to follow norms (Benoit, 2010).

Normative beliefs - expectations of how we should behave in a given situation (Benoit, 2010)

Persuasion - the use of messages to influence an audience or to help achieve a goal of the persuader (Benoit, 2010).

Pre-service Education – those organized learning experiences, for prospective instructors, which prepare them for future employment as teachers of vocational agriculture (Lamberth, 1982).

Professional Development Education – any structured program designed to improve the knowledge base of employed teachers (Gamon, Miller, & Roe, 1994).

Subjective norms - expectations we think others have about how we should behave; the normative component of the Theory of Reasoned Action (Benoit, 2010).

Supervised Agricultural Experience (SAE) - an SAE program is a planned practical agricultural activity which supports skill and competency development, career success and the application of specific agricultural and academic skills a student has learned through classroom instruction in agricultural education (National FFA Organization, 2009).

Traditional teacher certification - traditional teacher certificates have the greatest requirements for teachers. Teachers typically earn a bachelor’s degree in education, and have completed student teaching under the direction of a supervisor and/or master/mentor teacher (Brown, 1987; Cornett, 1984; Laczko-Kerr, 2002; Sandlin, Young & Karge, 1993).

Value – a judgment of worth (Benoit, 2010).

Volitional control - extent to which a person has voluntary power over what he or she will do (Benoit, 2010).

Assumptions

The following assumptions were made in conducting this study:

1. The course curriculum, for the agricultural mechanics course Agricultural Construction 1 and/or Agricultural Construction 2, were representative and appropriate for determining the professional development education needs of Missouri agriculture teachers who instruct this course;

2. The respondents were honest and truthful with their response and participation;

3. The respondents were familiar with the curriculum of Agricultural Construction 1 and/or Agricultural Construction 2;

4. The frame generated for this census study was representative of all school-based agriculture teachers in Missouri;

5. The instrument accurately measured the factors that influence Missouri agriculture teachers’ decision to teach selected components of the Agricultural Construction 1 and/or Agricultural Construction 2 curriculum;

6. The researcher adequately controlled for error when collecting data.

Limitations

The following limitations were associated with this study:

1. The study is limited to the population of school-based agriculture teachers in Missouri who teach Agricultural Construction 1 and/ or Agricultural Construction 2.

2. The factors that influence a teacher to instruct selected components of Agricultural Construction 1 and/or Agricultural Construction 2 are perceptions of Missouri agriculture teachers and not actual values.

CHAPTER TWO

REVIEW OF LITERATURE

Chapter Two is a review of literature related to the beliefs of teachers regarding curriculum implementation, the current agricultural mechanics curriculum in Missouri, and the agricultural mechanics professional development needs of school-based agriculture teachers in Missouri. The review is organized into six sections: Curriculum Implementation in the Academic Environment, Professional Development of Agriculture Teachers, Agricultural Mechanics in School-Based Agricultural Education Programs, Theoretical Framework, and the Summary.

Curriculum Implementation in the Academic Environment

Personal, Professional, and Environmental Factors Influencing Curriculum Implementation

Is classroom and laboratory instruction dependent upon a teacher's choice to instruct curriculum content? Often, the instruction of the curriculum is limited by resources allocated to the teacher and constraints of the schools' learning environment (Knobloch, 2008). This premise holds true for many subject areas, including the instruction of agricultural mechanics curriculum in the agricultural education classroom.

Lawrenz (1985) found that teachers will not implement educational resources into their classes if they are not convinced of the value of the curriculum and do not understand how to use it. Furthermore, the predetermined beliefs of teachers often influence how they connect academic content in the classroom to real-life applications. These real-life applications are often simulated in the laboratory or within the community (Knobloch, 2008).

Johnson (1995) stated that it is important for agricultural educators to believe in the curriculum that they teach. Without teacher support, success of implementing new curriculum is almost impossible. In a 2006 study of the implementation of mathematic concepts into horticulture classes, researchers determined that "teacher's concerns contribute to the barriers of implementation" of curriculum (Jansen, Enochs, & Thompson, p. 51). Furthermore, these researchers stated that the concerns of agriculture teachers "may hinder the success of student learning" (p. 51). Roberson, Flowers, and Moore (1997) found similar results with North Carolina agriculture teachers. They identified that a lack of teacher support for educational reform may relate to barriers that teachers encounter when attempting to integrate vocational and academic curriculum in the classroom. Interestingly, teachers have greater job satisfaction when they believe they can teach the curriculum and make positive impacts upon students (Hoy & Miskel, 2001).

Beliefs that teachers have about the implementation of curriculum in educational environments are developed due to various personal, professional, and environmental factors. These factors may include: personal beliefs about the curriculum or content (Borko & Putnam, 1996; Moseley, Reinke, & Bookout, 2002; Pajares, 1992); availability of time, availability of instructional resources, level of preparation regarding the content area (Thompson & Balschweid, 1999; Wilson, 1994), and teacher comfort level with the curriculum content (Knobloch & Ball, 2003). Perceived value of the content (Lawrenz, 1985), teachers' past experience with the content area (Calderhead, 1996; Thompson & Balschweid, 1999), classroom and laboratory teaching environment (Knoblock, 2001) and personal and professional motivation (Bandura, 1997; Tschannen – Moran, Woolfolk-Hoy, & Hoy, 1998) have also been found to influence teachers' decisions to implement curriculum. Jansen, Enochs, and Thompson (2006) determined that methods of curriculum delivery, teacher self-efficacy, administrative pressure towards the curriculum, field experience of the teacher, and individual beliefs influence the implementation of curriculum into the classroom and laboratory. Clark and Peterson (1986) found that the way a teacher thinks about curriculum influences their actions and also impacts the learning that takes place at school. Furthermore, the development and performance of teachers in the classroom is often influenced by the interaction of these personal, professional, and environmental factors (Knobloch, 2001).

Curriculum Adoption, Instruction, and Implementation

Curriculum taught in a classroom or laboratory depends on a teacher's personal theories and beliefs about education (Ross, Cornett, McCutcheon, 1992). Primarily, teachers teach what they know best (House, 1981). Therefore, if teachers have a low degree of knowledge concerning curriculum content, they will less likely include those topics in the course (Rudd & Hillison, 1995).

As new teaching innovations or processes are being discovered, developed, and introduced into the academic environment, teachers tend to be more concerned about the effects of the educational innovations on their students (Darr, 1985). Expectations that teachers hold toward an educational innovation will also affect their adoption (Rudd & Hillison, 1995). Furthermore, Darr (1985) found that when teachers perceive changes in the curriculum to be of benefit to their students, they are more likely to adopt educational changes.

In 2001, Niess found that teachers first learn how to teach based upon observations of their previous teachers. Hawkins (1990) pointed out that many early career teachers grasp from their personal experiences and continue to teach students based upon these acquired instructional methods. Identifying concerns that teachers have regarding the instruction of curriculum could prove to be valuable towards understanding teachers' professional development needs and for developing future in-service educational opportunities (Conroy, 1999).

The Teacher as the Change Agent

Teachers are important stakeholders in the educational change process (Newman & Johnson, 1994). According to Norris and Briers (1989), if changes in an educational program are to be successful, then the acceptance of these changes by teachers is essential. Furthermore, Norris and Briers also determined that teachers' perception toward change is the single best predictor of curriculum adoption. Fullam (1982) stated that "educational change depends on what teachers do and think" (p. 107).

Teacher behavior and readiness for change are among the most important variables associated with the success of school change in terms of positive student outcomes (Goodlad, 1975; Owens, 1987). Knobloch (2008) found that if teachers see the relevance of new curriculum and how it can help them reach their educational goals in the classroom, they would then utilize instructional resources to successfully integrate the curriculum.

Professional Development of Agriculture Teachers

The Importance and Purpose of Professional Development

Professional development generally refers to ongoing learning opportunities available to teachers and other educational personnel and it is typically provided by local schools and school districts. Effective professional development is often seen as increasingly vital to school success and teacher satisfaction. Therefore, with many of today's schools facing an array of complex challenges—from working with an increasingly diverse population of students, to integrating new technology in the classroom, to meeting rigorous academic standards and goals—observers have stressed the need for teachers to be able to enhance and build on their instructional knowledge (National Commission on Teaching & America's Future, 1996).

Agricultural educators are in constant need of professional development education (Barrick, Ladewig, & Hedges, 1983; Birkenholz & Harbstreit, 1987; Nesbitt & Mundt, 1993; Washburn, King, Garton & Harbstreit, 2001). In fact, the National Research

Agenda for Agricultural Education and Communication stated that "assessing the professional and continuing education needs of agricultural educators" is a priority initiative for agricultural education research (Osborne, 2007, p. 20). Today, school-based agricultural educators face a plethora of challenges both within and beyond the classroom. Educators are expected to provide a positive learning environment for students, prepare them for productive lives in a fast-paced world, and incorporate other subject area curriculum into agricultural education courses (Layfield & Dobbins, 2002).

More specifically, some educational leaders expect agricultural educators to integrate concepts like science, reading, and mathematics into the courses they teach (Washburn & Dyer, 2006). The constant evolution of agricultural education programs and the addition of core subject content skills have motivated many teachers to seek professional development opportunities to meet the demands of the changing emphasis of their programs (Washburn & Dyer, 2006). Several researchers have pointed out that agricultural educators are in constant need of professional development education in order to maintain and improve their teaching skills, effectively carry out their professional duties, and meet the demands of a changing educational environment (Barrick, Ladewig, & Hedges, 1983; Birkenholz & Harbstreit, 1987; Nesbitt & Mundt, 1993; Washburn, King, Garton & Harbstreit, 2001).

Goodlad (1983) stated that the teacher is the single most important variable in determining school effectiveness. Maintaining an effective teaching force will require the regular introduction of highly qualified entry-phase teachers and keep practicing teachers abreast of changes in the profession through in-service education (Anderson, Barrick, & Hughes, 1992). Anderson et al. (1992) further recommended that in order to keep current teachers aware of changing technology, policies, and curriculum improvements, teachers must develop and improve their skills, pedagogically and technically, through high quality professional development education programs.

Professional development is one of the most appropriate methods of fulfilling the lack of competencies of teachers (Maultsby, 1997). Due to the demand and changes of curriculum competencies in agricultural education, a career as a school-based agricultural educator cannot be based on only four years of academic preparation (Wilson, 1974). Cook and Fine (1996) agreed with Wilson and further stated:

> Professional development is a key tool that keeps teachers abreast of current issues in education, helps them implement innovations, and refines their practice. It must enrich teaching, improve learning, support teacher development, be ongoing and long term, be job embedded and inquiry based, support current beliefs about teaching and learning, be clearly related to reform efforts, be modeled after learning experiences considered valuable for adults, and support systematic change. (p. 1).

Brown (2002) found that professional development must provide opportunities for teachers to explore new roles, develop new instructional techniques, refine their practice, and broaden themselves both as educators and as individuals. Most professional development programs share a common purpose: to alter the professional practices, beliefs, and understanding of school persons toward an articulated end (Griffin, 1983). In 2007, the National Council for Agricultural Education identified professional development as a priority initiative to curtail teacher turnover and the attrition rate of early career teachers (Osborne, 2007). Furthermore, the National Council for Agricultural Education added that assessing the professional and continuing education needs of agricultural educators and assessing the models for the effective delivery of teacher professional development programs is essential to the future of agricultural education.

Forms of Professional Development for Teachers

According to Niven (1993), professional development is a necessity to provide agriculture teachers the knowledge and skills needed to successfully meet the demands of a changing educational environment and advances in instructional technology. Guskey (2002) stated that professional development programs should be systematic efforts designed to bring about change in the classroom practices of teachers, their attitudes and beliefs, and in the learning outcomes of students. For this reason, the development and delivery of professional development opportunities for teachers and educational personnel is critical for the ongoing success of education (Osborne, 2007).

Professional development education opportunities for teachers typically include pre-service programs, which are generally taken prior to entry into the teaching field or the issuance of a teaching certificate; and in-service programs, which are generally taken after entry into the field of education (Anderson, 1988). A National Center for Research in Vocational Education study identified multiple components of a comprehensive professional development program for vocational teachers (Hamilton, 1985). These components consisted of: pre-service programs for individuals entering teaching without an undergraduate education degree - alternative certification programs; supervision of first and second year vocational teachers - mentor/inductee programs; and updates concerning pedagogy, instructional technology, professional information, research practices; technical skills; testing, curriculum and program updates. Rodriguez and Knuth (2000) stated that professional development opportunities can come in a variety of forms such as mentoring, modeling, ongoing workshops, special courses, structured observations, and summer institutes.

The Development and Effectiveness of Professional Development Education for Agricultural Educators

Historically, the creation, implementation, and evaluation of professional development education have been one of the roles of collegiate agricultural education programs and state agricultural education supervisory staff (Barrick, Ladewig, & Hedges, 1983). Traditionally in agricultural education, three predominate methods have been used by agricultural teacher educators and state supervisory staff to determine the in-service needs of agriculture educators: research (Layfield & Dobbins, 2000; Washburn, King, Garton & Harbstreit, 2001), personal experiences (Barrick et al., 1983), and informal inquiry with current agricultural educators (Barrick et al., 1983; Roberts & Dyer, 2004). Unfortunately, the planning and implementation of these professional development opportunities has generally utilized little input from school-based agricultural educators (Washburn, et al., 2001).

Professional development has typically been provided to teachers through school in-service workshops (Education Week, 2010). The district or school usually brings in an outside consultant or curriculum expert on a staff-development day to give teachers a one-time training seminar on a variety of pedagogic or subject-area topics (National Commission on Teaching and America's Future, 1996). According to a review of literature, most professional development programs designed to improve teacher effectiveness are ineffective and often fail (Cohen & Hill, 1998, 2000; Kennedy, 1998; Wang et al., 1999). Moreover, most professional development education lacks continuity, coherence, misconceptions of the way adults learn, and fail to appreciate the complexity of teachers' work (Little, 1994; Miles, 1995). Guskey (2002) remarked that schools can be no better than the teachers and administrators who work within them. Therefore, high quality professional development is a central component in nearly every modern proposal for improving education (Guskey, 2002).

According to Layfield and Dobbins (2002), a critical factor in developing successful teachers is correctly identifying professional development needs that are in the greatest demand. By understanding the problems faced by agricultural educators, university faculty and state agricultural education supervisory staff can improve professional development programs to address teachers' needs (Mundt & Connors, 1999). Literature suggests that providers of continuing education programs have experienced difficulties in identifying appropriate topics to include in professional development programs (Washburn, et al., 2001). To accomplish this goal, providers of professional development education should monitor the needs of agriculture teachers over time and provide educational programs based upon their current needs (Birkenholz & Harbstreit, 1987). Garton and Chung (1995) concluded that “the in-service needs of agriculture teachers should be assessed and prioritized on a continual basis” (p. 78).

Waters and Haskell (1989) suggested that current educators be included in the process to identify contemporary professional development in-service needs of agriculture teachers. They stated that “gathering data from potential clientele and actively involving them in the process of identifying potential educational programs increases the likelihood of implementing relevant educational programs; thus, increasing the likelihood of achieving appropriate outcomes” (p. 26). Furthermore, Newcomb, McCracken, and Warmbrod (1993) stated that “individuals are more motivated to learn when they are actively involved in planning learning activities” (p. 32). In a study of New York agricultural science educators, researchers found that teachers believed professional development was most meaningful to them when it was personalized to their needs (Park, Moore & Rivera, 2007). When teachers felt engaged, they set their own learning expectations, became interested, and asserted themselves toward changing their teaching practices. By understanding the major problems facing school-based agriculture teachers, teacher educators and state supervisory staff can make improvements in the professional development in-service programs offered to today’s teachers (Washburn & Dyer, 2006).

Agricultural Mechanics in School-based Agricultural Education Programs

Agricultural Mechanics and Agricultural Mechanics Education

Agricultural mechanics is operationally defined as “the selection, operation, maintenance, servicing, selling, and use of power units, machinery, equipment, structures, and utilities used in agriculture” (Herren, 2006, p. 4). Agricultural mechanics also includes “the design, construction, repair, and operation of machinery. The broad term agricultural mechanics may also consist of other related areas such as: agricultural structures, land and water management, and electrical applications” (Phipps & Miller, 1998, p. 5). Additionally, Phipps and Miller concluded that “agricultural mechanics is the use of machinery to do agricultural jobs” (p. 5).

With a vast amount of contextual and operational definitions of agricultural mechanics, one might be confused about the exact curriculum content that is taught in school-based agricultural education programs. Although curriculum content can vary from state to state, Phipps (1983) noted that general agricultural mechanics instruction includes all the unspecialized mechanical activities performed on the farm and in agriculturally oriented businesses and services. According to the National FFA Organization (2006), “an agricultural mechanics education is comprised of strong technical content and complimented by the development of practical, hands-on skills” (p. 43). Phipps (1983) also identified the following five areas of instruction that usually constitute the content of agricultural mechanics instruction: agricultural shop work, agricultural power and machinery, agricultural electrification, agricultural buildings and conveniences, and soil and water management. Some of the overarching educational objectives that are included in the instruction of school-based agricultural mechanics consist of:

1. Developing desirable work ethics.
2. Discovering mechanical aptitudes.
3. Developing dependable judgment in agricultural mechanics activities.
4. Developing basic skills in agricultural mechanics.
5. Developing self-confidence in performing mechanical operations.
6. Understanding the underlying principles of mechanical processes.
7. Recognizing quality work in agricultural mechanics jobs.
8. Developing interest in and willingness to do agricultural mechanics jobs.
9. Understanding and determining which mechanical activities can be done more economically by someone else.
10. Utilizing opportunities for learning by doing.
11. Developing abilities necessary for doing the unspecialized mechanical jobs that a worker in an agricultural occupation needs to be able to do.
12. Developing the ability to work cooperatively and effectively with others in a school's agricultural shop. (Phipps, 1983, p. 3-4)

The Importance of Agricultural Mechanics Education

Herren (2006) pointed at the value of agricultural mechanics education stating, "agricultural mechanics has been fundamental to the development of the agricultural industry in this country. Much of the tremendous increase in the efficiency of the American producer is due to the innovations in (agricultural) mechanics. As further advances are made, the role of mechanics in agriculture will be as prominent in the future as it has been in the past." (p. 10).

Agricultural mechanics instruction continues to be a critical component of many secondary agricultural education programs throughout much of the U.S. According to Kotrlik and Drueckhammer (1987) agricultural mechanics and supervised occupational experience (SAE) programs were the two most important components in ensuring quality secondary agricultural education programs in the future. Laird and Kahler (1995) recommended that agricultural mechanics instruction should continue to be included in every secondary agricultural education program. In a 1997 study of secondary agriculture teachers, Rosencrans and Martin found that the majority (69%) of the participating teachers believed that agricultural mechanics instruction was a critical component of an agricultural education program.

A significant portion of the instructional time in school-based agricultural education is dedicated to the curriculum area of agricultural mechanics. According to Shinn (1987), approximately one-third to two-thirds of a teachers' daily instructional time is devoted to agricultural mechanics. Phipps and Osborne (1988) estimated that in many courses, the time allocated for instruction in agricultural mechanics comprises 25% to

40% of a teacher's total instructional time. In a 1989 study of Missouri school-based agricultural educators, Johnson determined that these teachers devoted almost 40% of their instructional time to teaching agricultural mechanics. Furthermore, Luft (1989) conducted a study similar to Johnson's in North Dakota and determined that school-based agriculture teachers there spent approximately 44% of the available class time for instruction of agricultural mechanics. In addition, Hoerner and Beckum (1990) reported that agriculture teachers from seven states taught an average of two agricultural mechanics classes per semester. More recently, Saucier, Schumacher, Terry, Funkenbusch, and Johnson (2008) found that Missouri agricultural educators spent an average of 10 hours per week instructing agricultural mechanics curriculum in a laboratory environment. They also found that 93% of agricultural educators in Missouri teach at least one agricultural mechanics course per academic year.

The Agricultural Mechanics Laboratory: A Place for Learning

In addition to the instruction of agricultural mechanics in the classroom, agricultural educators use laboratories to instruct students about hands-on skills and technology applications. Hubert, Ullrich, Lindner and Murphy (2003) acknowledged that agricultural mechanics programs "offer many unique hands-on opportunities for students to develop both valuable academic and vocational skills" (p. 1). Furthermore, Johnson, Schumacher and Stewart (1990) stated that students learn important psychomotor skills in agricultural mechanics and that much of the instruction takes place in the school agricultural mechanics laboratory. According to Osborne and Dyer (2000), agricultural laboratories provide opportunities for students to actively and experientially engage in scientific inquiry and application.

Laboratories are essential educational facilities for agricultural mechanics programs. As Johnson and Schumacher (1989) pointed out, much of the instruction for agricultural mechanics takes place in the laboratory setting. As such, a great deal of instructional time is spent in the agricultural mechanics laboratory. Phipps and Osborne (1988) estimated that in many courses the time allocated for instruction in agricultural mechanics comprises 25% to 40% of the total instructional time of the entire agricultural education program. In 1986, Bear and Hoerner found that laboratory experiences are an integral component of agricultural mechanics instruction and efficient management of the school agricultural mechanics laboratories is essential to maximizing student learning.

The agricultural mechanics laboratory is a critical component of instructing agricultural mechanics curriculum to students (Johnson & Schumacher, 1989). However, one critical component of instructing students in an agricultural mechanics laboratory is safety. According to Hubert et al. (2003), "if skill development is the focus of laboratory instruction, then thorough attention to all its components, including safety instruction, is essential" (p. 3). Fletcher and Miller (1995) found that agricultural mechanics students are exposed to equipment, materials, tools, and supplies that are potentially hazardous to their health and that could cause injury or death. Shinn (1987) emphasized that the agricultural mechanics laboratory must be a safe and well organized environment if optimum student learning is to occur. In 1986, Burke described practices associated with efficient laboratory management. He listed the regulation of environmental factors, control of consumable supplies, and storage of tools as areas that are important for the efficient and safe management of the agricultural mechanics laboratory. Further emphasizing the importance of safety in the agricultural mechanics laboratory, Swan (1992) noted that instructional safety programs are a must and should be of high priority to the instructor. He further stated that the most important responsibility of the instructor is to ensure the safety of the students (Swan, 1992). With a significant amount of instructional time being spent teaching students in an agricultural mechanics laboratory and the inherent safety considerations of students working with tools in the laboratory, professional development for agricultural educators is a priority if a high level of teaching and learning is to be maintained (Birkenholz & Harbstreit,1987; Caffarella, 1982; Garton & Chung; 1995).

Missouri Agricultural Education

Agricultural education has had an unwavering presence in Missouri since the passage of the Smith-Hughes Act of 1917 (Missouri Department of Elementary and Secondary Education, 2010a). This federal legislation created and funded vocational agriculture courses that were to be taught in Missouri public schools. In 1928, the student leadership organization known as the National FFA Organization was created. In that same year, 62 local Missouri FFA chapters were chartered as well.

Agricultural education in Missouri consists of both school-based and adult education programs. The educational model that illustrates Missouri agricultural education is a three circle, Venn diagram consisting of three interdependent elements:

classroom instruction, SAE, and leadership development (Missouri Department of Elementary & Secondary Education, 2010a). Figure 1 is illustrated below.

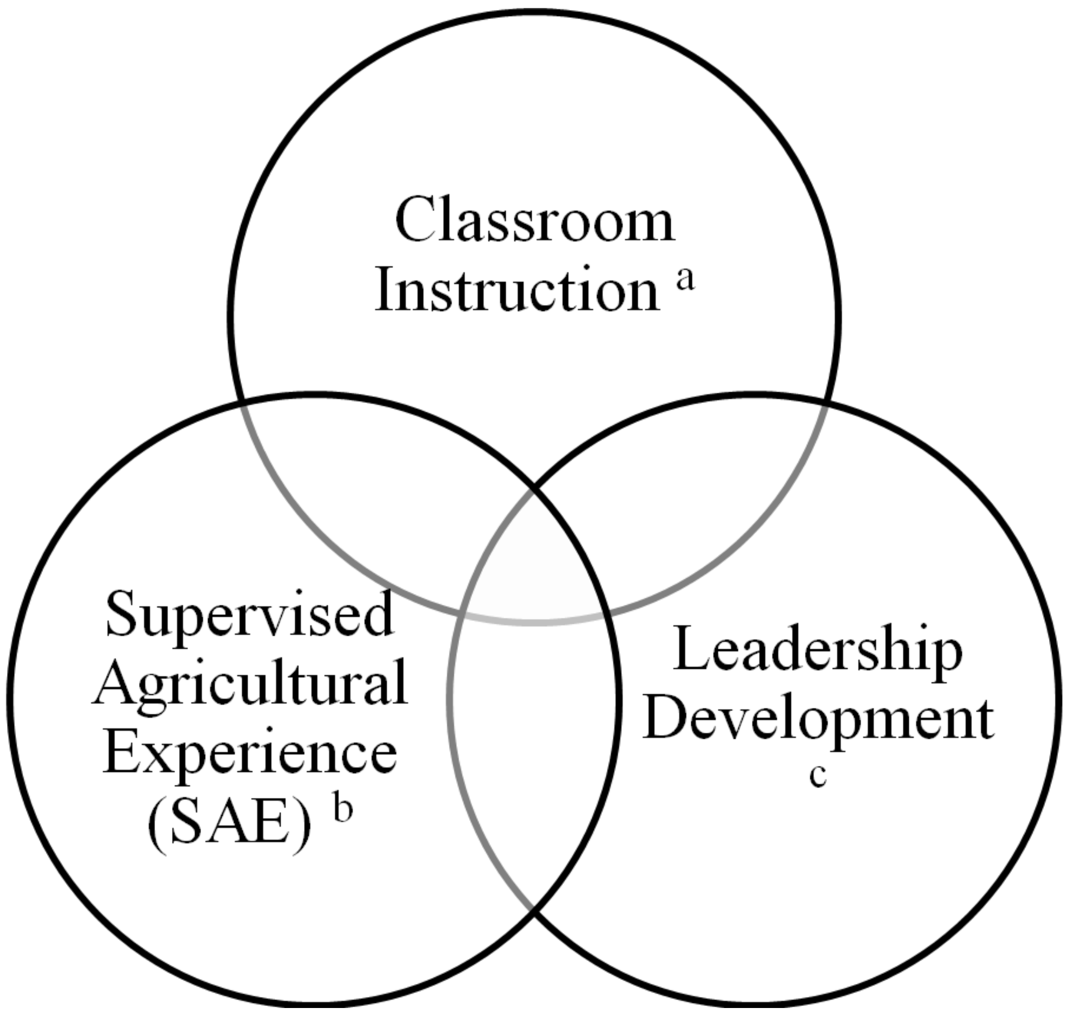

Figure 1. The model for School-based Agricultural Education programs in Missouri. [a] Classroom/laboratory instruction using the “problem solving technique. [b] Supervised agricultural experience in which each student gains “hands-on” experience outside the classroom. [c] Leadership development through the FFA in high school, PAS at the postsecondary institutions, and Young Farmers for adults currently employed in agriculture.

According to the Missouri Department of Elementary and Secondary Education (2010a), the role of agricultural education programs is to “prepare secondary, postsecondary, and adult students for a variety of careers and advanced college or technical training in the agriculture, food, and natural resources system” (p. 2). Career opportunities for students range from positions in agribusiness, food science, agricultural mechanics technology, plant science and horticulture, animal science, and natural resources conservation industries (Missouri Department of Elementary & Secondary Education). Missouri agricultural education offered in public schools consists of 26 courses that include the following curriculum areas: introductory agricultural science, agricultural management/economics, animal science, plant science, forestry, agricultural literacy, food science and technology, conservation and natural resources, and agricultural mechanics (Missouri Department of Elementary & Secondary Education).These courses are delivered through four-year cluster programs at comprehensive high schools and adult career centers, two-year community college programs, and supplemental and specific adult education in high schools, area career centers, and community colleges. At each level of education, programs utilize the Missouri agricultural education model described above (Missouri Department of Elementary & Secondary Education).

Today, Missouri’s agricultural education courses have an enrollment of 37,718 school-based students and an adult-student enrollment of 3,110. Currently, Missouri public schools offer 26 different agricultural education courses to students. Additionally, these courses are taught at 316 public schools throughout Missouri (Missouri Department of Elementary and Secondary Education, 2010a). During the 2008-2009 academic year, the Missouri FFA Association also had 24,416 members (Missouri Department of Elementary and Secondary Education).

Agricultural Mechanics Instruction in Missouri

Agricultural mechanics curriculum has had a long and significant role in Missouri agricultural education. With the inception of vocational agriculture classes following the passage of the Smith-Hughes Act of 1917, Missouri students have had the opportunity to learn about agriculture. This included the instruction of farm mechanics. In the 2008-2009 academic school year, courses including content related to agricultural mechanics were taught in 258 schools in Missouri with a student enrollment of 23,299 students (Missouri Department of Elementary and Secondary Education, 2010a). Currently, Missouri students have the option of enrolling in two introductory agricultural education courses that include agricultural mechanics content, Agricultural Science I and Agricultural Science II, and five content specific agricultural mechanics courses: Agricultural Power I, Agricultural Power II, Agricultural Machinery, Agricultural Structures, and Agricultural Construction. Listed below are the main educational areas that are taught in each course (Missouri Department of Elementary and Secondary Education):

<u>Agricultural Science I</u>

- Hand tools, power tools, arc welding, oxy-fuel cutting, tool sharpening and reconditioning, woodworking, and painting and finishing.

Agricultural Science II

- Power tools, arc welding, oxy-acetylene welding, spray painting and finishing, tool sharpening and reconditioning, cold metal work, and material selection, plan reading, and interpretation.

Agricultural Power I

- Explaining principles of operation, using measuring tools, using shop tools and equipments, selecting engine parts and fasteners, using a service manual, testing and analyzing a single cylinder engine system, servicing a single cylinder engine.

Agricultural Power II

- Principles of operation, testing and analyzing multi-cylinder components, servicing a multi-cylinder engine, and servicing a power train.

Agricultural Machinery

- Following safety procedures, operating and maintaining power units, operating and maintaining secondary tillage equipment, operating and maintaining planting equipment, operating and maintaining chemical applicators, operating and maintaining harvesting equipment, and operating and maintaining materials and handling equipment.

Agricultural Structures

- Working with plans, farmstead planning, building construction, concrete, electricity, plumbing, and fencing.

Agricultural Construction

- Arc welding, project construction, oxy-gas and other cutting/welding processes, woodworking, metals, and finishing.

The Missouri model for agricultural education not only allows students to learn about agricultural mechanics in the classroom and laboratory, but it also provides them an opportunity to apply their knowledge through FFA competitions and programs. During the American involvement in World War II (1941-1945), FFA members provided service to communities by authoring articles over various aspects of agriculture including machinery repair (Missouri FFA Association, 1978). After World War II, Missouri FFA members continued to compete in agricultural mechanics related contests and apply for FFA award programs. In 1948, Missouri FFA members competed in the Farm Mechanics Proficiency Award and the Farm Electrification Proficiency Award in 1951 (Missouri FFA Association). Today, Missouri FFA members have the opportunity to complete in many agricultural mechanics related- contests that include: the Agricultural Mechanics CDE contest (Missouri Department of Elementary and Secondary Education, 2010b), proficiency awards, welding contests, and the state fair agricultural mechanics project show (Missouri State Fair, 2009).

The Missouri FFA agricultural mechanics project show is held each summer in conjunction with the Missouri State Fair in Sedalia, Missouri. At this project show, contestants from FFA chapters in Missouri have to the opportunity to display their agricultural mechanics projects and compete for ribbons and prizes. At this contest, a wide variety of projects are displayed from restored farm tractors to cattle trailers to bird houses (Missouri State Fair, 2009).

As early as 1938, Missouri FFA members have competed in agricultural related skill contests, now known as Agricultural Mechanics Career Development Events (CDE) (Missouri FFA Association, 1978). In 2009, FFA members from 60 chapters in Missouri completed in the Missouri Agricultural Mechanics CDE contest. A student team is typically composed of 3 or 4 FFA members who have an aptitude for agricultural mechanics. In the contest, students must answer questions concerning three skill areas: agricultural power & machinery, agricultural structures and electricity, agricultural construction and soil & water management. They also complete a comprehensive exam concerning agricultural mechanics. The top three student scores from each team are combined to form a team score. The team score is then compared against the scores of other teams to determine the winner of the contest (Missouri Department of Elementary and Secondary Education, 2010b). Listed below is a description of the Missouri FFA Association Agricultural Mechanics CDE contest:

> The overall purpose of the Agricultural Mechanics CDE is to motivate contestants to greater learning by providing an opportunity to apply classroom knowledge in a competitive situation and to promote state-of-

> the-art agricultural mechanics programs within the state of Missouri. The Missouri State Agricultural Mechanics CDE shall reflect the agricultural mechanics instruction provided contestants in Missouri secondary agriculture departments. Specifically, the skill and problem solving activities shall reflect the competencies included in the Missouri agricultural mechanics curriculum. Agricultural mechanics competencies shall include the areas of agricultural machinery, small engine power, tractor power, agricultural electrification, woodwork and carpentry, concrete and plumbing, metal fabrication, soil and water management, and repair and maintenance. The written examination, skill activities, and problem solving activities will be conducted to assess the participants' knowledge of these agricultural mechanics competencies. (Missouri Department of Elementary and Secondary Education, 2010b, p. 1).

Agricultural Mechanics Professional Development Education Needs

One of the most important areas of professional development for agricultural educators is agricultural mechanics (Saucier, Tummons, Terry, & Schumacher, 2010). In fact, the instruction of agricultural mechanics is considered a very important part of the total agricultural education program at most schools (Hubert & Leising, 2000; Kotrlik & Drueckhammer, 1987; Phipps, 1983; Rosencrans & Martin, 1997). Even on the state level, researchers found that state education agencies continue to dedicate a large portion of the school-based agricultural education curriculum to the instruction of agricultural mechanics (Burris, Robinson, & Terry, 2005). Burris, Robinson, and Terry also determined that teacher preparation institutions should continue to dedicate part of their degree programs to developing teacher competencies in the skill areas of agricultural mechanics.

Many studies have determined that agriculture teachers in all phases of their career require professional development education in the area of agricultural mechanics. In a 1986 study of pre-service teachers, Foster reported high levels of anxiety associated with the teaching of agricultural mechanics prior to and during the student teaching experience. In a national study, Burris, Robinson, and Terry (2005) found that teacher educators identified agricultural mechanics as a vital part of school-based agricultural programs. This group rated the level of preparation of program graduates, in the area of agricultural mechanics, lower than their level of importance of competencies in that area. The discrepancy between the importance and the graduates' level of preparation underscores the fact that teacher educators must continue to include agricultural mechanics in their teacher preparation programs. This perception of agricultural mechanics further implicates the need for adequate preparation of pre-service teachers in agricultural mechanics. The researchers further stated that pre-service teachers would benefit from programs that offer experiences in a wide range of agricultural mechanics content areas. Hubert and Leising (2000) found results similar to those of Burris, Robinson, and Terry. For agriculture teachers to do the best job possible teaching agricultural mechanics; they need to receive current and reliable pre-service agricultural mechanics instruction (Hubert & Leising).

The need for additional education in the specialized area of agricultural mechanics is not limited to pre-service teachers. A review of literature indicated the need for agricultural mechanics professional development for existing agricultural educators (Edwards & Briers, 1999; Garton & Chung, 1995; Johnson, Schumacher, & Stewart, 1990; Roberts & Dyer, 2004; Saucier, Terry, & Schumacher, 2009; Washburn, King, Garton, & Harbstreit, 2001). In 1999, Edwards and Briers conducted a study of early-career school-based agricultural educators in Texas. They found that these teachers had in-service needs in the area of agricultural mechanics. More specifically, their subjects had in-service needs in the areas of integrating computer aided drafting (CAD) into agricultural mechanics curriculum and planning laboratory facilities for integrated courses such as physics with agricultural mechanics. In 2001, Washburn, King, Garton, and Harbstreit found that Kansas and Missouri teachers with 15 or fewer years of experience had professional development education needs in agricultural mechanics project construction. Roberts and Dyer (2004) found that both alternatively certified and traditionally certified agricultural educators in Florida had professional development needs in the following areas of agricultural mechanics: small engine technology, large and small agricultural mechanics construction, metal fabrication techniques, tool and equipment repair, electricity, and global positioning systems (GPS). More recently, researchers (Saucier, Terry, & Schumacher, 2009; Saucier, Tummons, Terry, & Schumacher, 2010), found that Missouri school-based agricultural educators had agricultural mechanics in-service needs in the following areas: global positioning systems (GPS), agricultural structures, project construction, renewable energy resources, electricity, small engine technology, tractor restoration, metal fabrication, plumbing, and laboratory management.

A teachers' knowledge of agricultural mechanics skills is just as important to the instruction of students as their ability to safely manage an agricultural mechanics laboratory. Hubert, Ullrich, Lindner and Murphy (2003) suggest that if skill development is the focus of laboratory instruction, then thorough attention to all its components, including safety instruction, is essential. In 1984, Harper found that students will be more safety conscious if teachers also follow proper safety practices, demonstrate accurate safety knowledge, provide a safe laboratory environment, convey a positive safety attitude, and relay safety expectations to the students. Unfortunately, many agricultural educators do not receive adequate training prior to beginning their teaching careers or after accepting a teaching position (Foster, 1986). Swan (1992) found that North Dakota secondary agricultural mechanics instructors had deficient preparation in laboratory safety practices. Dyer and Andreasen (1999) suggested that new agriculture teachers were inadequately trained in safety and experienced teachers were even less safety conscious. As indicated by Barrick and Powell (1986), first year agriculture teachers rated managing laboratory learning as a highly important ability for agriculture teachers. The first year agriculture teachers also felt that their level of knowledge concerning the management of laboratory learning was low. According to Schlautman and Silletto (1992), teacher educators should utilize teaching experiences to better develop and enhance laboratory management skills for their students.

In 1990, Johnson, Schumacher and Stewart concluded that Missouri secondary agriculture teachers had in-service needs in the area of agricultural mechanics laboratory management. They also stated that teachers had the greatest in-service needs in the area of safety. In a similar study conducted in Nebraska in 1992, Schlautman and Silletto found that Nebraska secondary agriculture teachers had in-service needs in the area of agricultural mechanics laboratory management safety and policy implementation. Fletcher and Miller (1995) found similar results in their study conducted in Louisiana. They found that Louisiana secondary agriculture teachers were not using recommended safety practices or providing student safety and emergency equipment to the extent warranted by the hazards found in the agricultural mechanics laboratories. Without a combination of skill level, a sound knowledge base, and safe laboratory management procedures, student learning in an agricultural mechanics laboratory will not exist.

With a large portion of instructional time being spent on the delivery of agricultural mechanics instruction to students in a laboratory (Hubert & Leising, 2000; Johnson, 1989; Luft, 1989; Saucier, Schumacher, Terry, Funkenbusch, & Johnson, 2008; Shinn, 1987), the inherent safety considerations of students working in a laboratory full of potential hazards and risks (Fletcher & Miller, 1995; Swan, 1992), and the importance that this curriculum plays in the overall success of the local agricultural education program, one might ask, what professional development needs do teachers have in the area of agricultural mechanics? Numerous studies have been conducted to determine this professional development education need. In these studies, the need for professional development education in the area of agricultural mechanics is ever present for teachers in all career phases (Edwards & Briers, 1999; Fletcher & Miller, 1995; Garton & Chung, 1995; Johnson, Schumacher, & Stewart, 1990; Saucier, Terry, & Schumacher, 2009; Schlautman & Silletto, 1992). However, no studies have been conducted to determine the factors that influence teachers to instruct agricultural mechanics curriculum.

Theoretical Framework

Ajzen and Fishbein's Theory of Reasoned Action

The Theory of Reasoned Action was developed by Martin Fishbein and Icek Ajzen as an improvement over the Information Integration Theory (Ajzen & Fishbein, 1980; Fishbein & Ajzen, 1975). According to Fishbein and Ajzen (1975), an individual will hold a positive attitude toward a given act, or behavior, if an individual believes that the performance of the behavior will lead to a more positive outcome. On the other hand, if the individual believes that a negative outcome will result from the behavior, the individual will then hold a negative attitude toward it.

Fishbein and Ajzen (1975) added a fundamental element to the Theory of Reasoned Action - behavioral intention. Rather than just attempt to predict the attitudes of subjects, as does the Information Integration Theory, the Theory of Reasoned Action is explicitly concerned with behavior. Another notable feature of this theory is that it also recognizes that there are situations (or factors) that limit the influence of attitude on behavior. Therefore, the Theory of Reasoned Action predicts behavioral intention; a compromise between attitude prediction and actually predicting behavior. Since this theory separates behavioral intention from behavior, the Theory of Reasoned Action also discusses the factors that limit the influence of attitudes (or behavioral intention) on behavior (Benoit, 2010; Fishbein & Ajzen).

The second change from the Information Integration Theory is that the Theory of Reasoned Action (Ajzen & Fishbein, 1980; Fishbein & Ajzen, 1975) uses two elements, attitudes and norms (or the expectations of other people), to predict behavioral intent. The theory suggests that when our attitudes persuade us to do one thing, but the relevant norms suggest we should do something else, both factors influence our behavioral intent.

More specifically, the Theory of Reasoned Action (Fishbein & Ajzen, 1975) predicts that behavioral intent is caused or created by two factors: our attitudes and our subjective norms. Just as in the Information Integration Theory, attitudes have two components (Benoit, 2010). Fishbein and Ajzen call these the evaluation and strength of a belief. The second component influencing behavioral intent, subjective norms, also have two components: normative beliefs (what I think others would want or expect me to do) and motivation to comply (how important it is to me to do what I think others expect).

While the work by Eccles, Adler, Futterman, Gof, Kaczala, and Meece (1983) contained many components based on the work of Fishbein and Ajzen, they also suggested that many investigators fail to distinguish between beliefs, attitudes, and intentions. Due to the limitations in this theory concerning the aspect of behavior, the researcher chose to also ascribe to Ajzen's Theory of Planned Behavior (1991). The Theory of Reason Action (Fishbein & Azjen, 1975) is displayed in Figure 2.

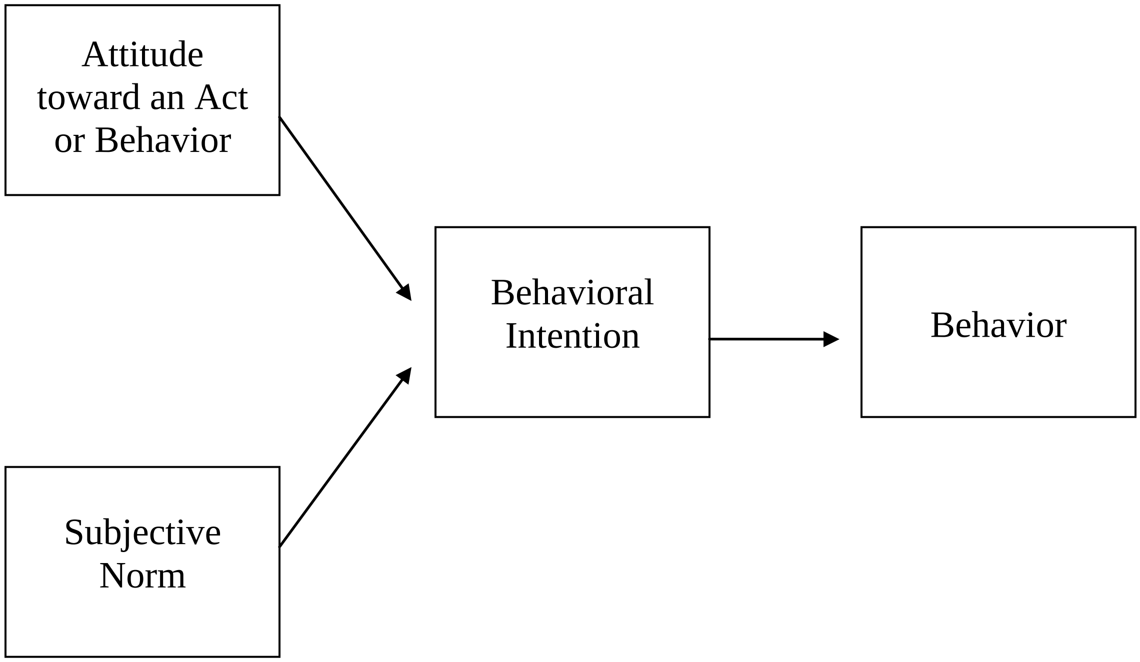

Figure 2. Theory of Reasoned Action (Ajzen & Fishbein, 1975).

Ajzen's Theory of Planned Behavior

The Theory of Planned Behavior is an extension of the Theory of Reasoned Action (Ajzen & Fishbein, 1980; Fishbein & Ajzen, 1975). This theory was developed due to the limitations in the original theory regarding behaviors over which people have incomplete volitional control. Due to the fact that many educational decisions are made without the teachers consent, the researcher felt it was imperative to include a theory that addressed the behaviors of teachers regarding the lack of volitional control over their educational environment.

Ajzen (1988) identified many of the motivating factors which lead to, or prevented, people from carrying out certain actions. According to his theory, volitional control is more likely to present a problem for some behaviors than for others. Personal deficiencies and external obstacles can also interfere with the performance of any behavior (Ajzen, 1988). This theory suggested that investigators should not only look at beliefs, attitudes, and intentions of individuals, but also their behavior (Ajzen, 1988).

According to Ajzen (1988), research into people's attitudes that might influence the adoption of certain behaviors has shown that the attitude toward a behavior is determined by salient beliefs about that behavior. This term is also known as behavioral beliefs. Fishbein and Azjen (1975) further stated that to understand a person’s behavior requires more than just the knowledge of his or her intentions, but it is also appropriate to measure their intention in order to predict their future behavior.

A central factor in the Theory of Planned Behavior (Azjen, 1991) is that an individuals’ intention to perform a given behavior. Intentions are assumed to capture the motivational factors that influence a behavior. They are indications of how hard people are willing to try and how much of an effort they are planning to exert in order to perform the behavior (Azjen, 1991). As a general rule the stronger a person’s intention to engage in a behavior, the more likely they will have a stronger performance in that behavior.

The theory further indentifies non-motivational factors that can be used to determine a persons’ performance at a given behavior. These non-motivational factors can include the availability of requisite opportunities and resources that include: time, money, personal skill level, and the cooperation of others (Azjen, 1991). Collectively, motivational and non-motivational factors represent a person’s actual control over a behavior. Furthermore, the theory states that if a person has the required opportunities and resources, and intends to perform the behavior, the person should succeed in their behavior.

The component, subjective norm, included in Ajzen's theory (1991) represents the perceived social pressures on the individual. These subjective norms refer to peoples’ beliefs about other people's attitudes towards the behavior and how important their opinions are. In this study, the perceived behavioral control component refers to the extent to which teachers believe themselves to be capable of teaching curriculum which is assumed to reflect past experience as well as anticipated impediments and obstacles (Ajzen, 1988). The inclusion of this component in Ajzen's theory recognizes that if teachers are not confident about their own agricultural mechanics skills, then they may feel unable to implement the agricultural mechanics curriculum in their classroom or laboratory. Azjen’s Theory of Planned Behavior is illustrated in Figure 3.

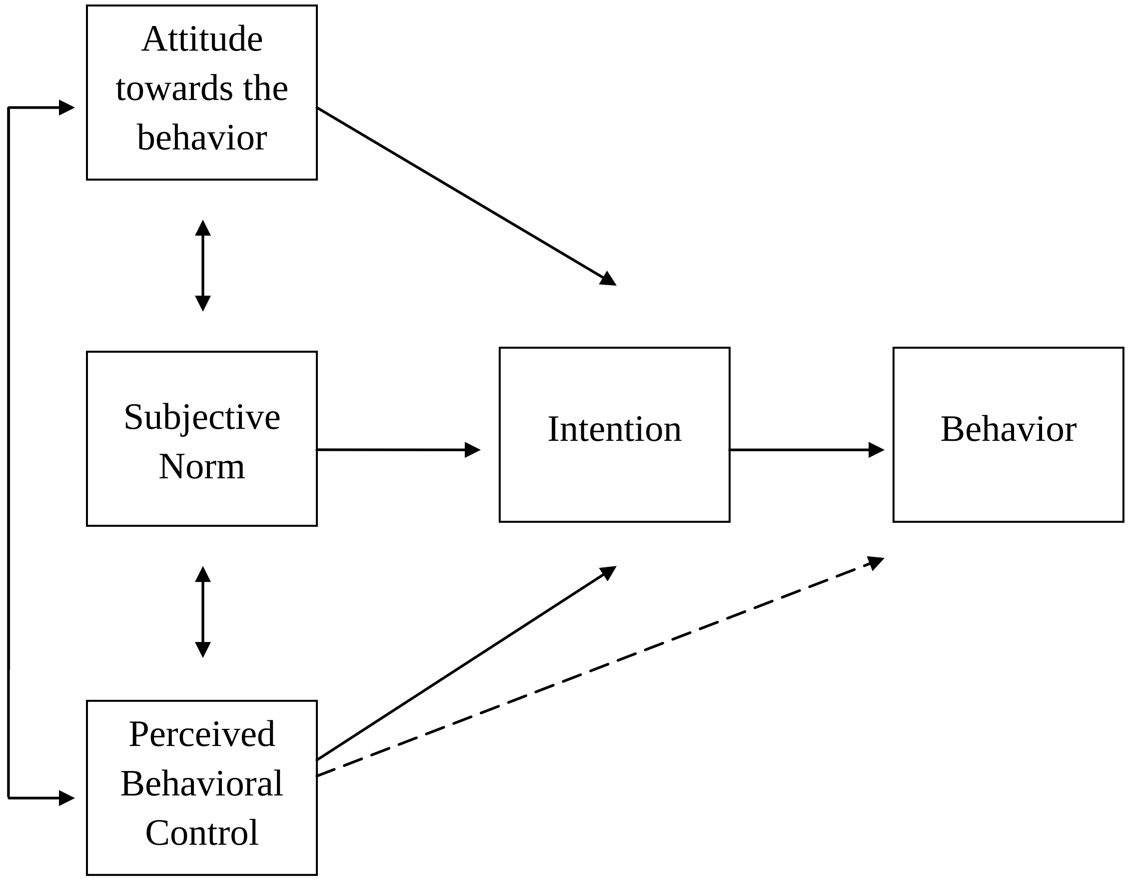

Figure 3. Theory of Planned Behavior (Azjen, 1991)

Atkinson's Theory of Achievement Motivation

Atkinson's Theory of Achievement Motivation has been used to understand the motivations that trigger individuals' behaviors and is one of the major frameworks for achievement motivation (Atkinson, 1957, 1964; 1965; Atkinson & Feather, 1966). The theory proposes that if one can identify the factor, or factors that impact an individual's intention, then an individual's behavior can then be predicted. Atkinson further stated that achievement behaviors represent a conflict between approach (hope for success) and avoidance (fear of failure) tendencies. The basis of this theory is that individuals choose behaviors based on the outcomes they expect and the values to which they ascribe (Borders, Earlywine, & Hewey, 2004).

In the formulation of modern expectancy-value theory, values and ability beliefs, or expectancies for success, are the most important motivations that predict behaviors (Eccles, Adler, Futterman, Gof, Kaczala, & Meece, 1983). According to researchers, Atkinson's Theory of Achievement Motivation has several flaws that fail to link more elaborate expectancy and value components positively to one another, rather than inversely related as proposed by Atkinson (Eccles & Wigfield, 2002). This theory of motivation was provided as a foundational building block for the Expectancy – Value Theory of Achievement Motivation (Eccles, Adler, Futterman, Gof, Kaczala, & Meece, 1983). For further explanation of the development of this theory, see Figure 4.

Atkinson's Theory of Achievement Motivation Formula

$$T_a = T_s + T_{-f} + T_{ext} \quad (1)$$

T_a = an active impulse to undertake a particular achievement- oriented activity.

$T_s = M_s(P_s)(I_s)$

M_s = tendency to approach success, usually assessed with the aid of the Thematic Aperception Test (TAT); P_s = subjective probability of success, ranging on a scale from 0.00 to 1.00; I_s = incentive value of success, it is assumed that $I_s = (1\text{-}P_s)$;

$T_{-f} = M_{af}\ (P_s)\ (I_s)$;

M_{af} = tendency to avoid failure, usually assessed with the aid of the Test Anxiety Questionnaire (TAQ); P_f = subjective probability of failure; I_f = incentive value of failure; $I_f = (1 – P_f)$; in computing the values in the equation, the sign is assumed to be negative ($- I_f$);

T_{ext} = positive extrinsic tendency to perform the activity; these are tendencies which are not associated with pride in achievement per se; included, e.g., would be motives to comply or seek for approval which may eventuate in achievement behavior in given context; the inclusion of T_{ext} in the formula represents a recent recognition of the fact that social contexts typically also bring non – nAch motives to bear on the achieving situation.

Figure 4. Theory of Achievement Motivation Formula (Atkinson, 1957).

Expectancy-Value Theory of Achievement Motivation

The Expectancy-Value Theory of Achievement Motivation is one of the major frameworks for achievement motivation theory (Atkinson, 1957). According to this theory (Eccles et al., 1983), behavior is a function of the expectancies that one has and the value of the goal toward which one is working. This theory also predicts that when more than one behavior is possible, the behavior chosen will be the one with the largest blend of expected success and value.

The main concept behind the Expectancy-Value Theory of Achievement Motivation is that people are goal-oriented creatures. This theory differs from Atkinson's Theory of Achievement Motivation (1957) in that both the expectancy and value components are more elaborate and linked to psychological and social/cultural determents. In addition to, expectancies and values are assumed to be positively related to each other; rather than inversely related as proposed by Atkinson (Eccles & Wigfield, 2002; Lawver, 2009).

In 1983, Eccles et al. originally developed the expectancy-value model to investigate gender enrollment patterns in secondary school mathematics (Lawver, 2009). The researchers argued that existing research in the area of student academic choice was limited by the lack of a combination of theoretical frameworks to guide the organization of variables that influenced achievement related choices and the subjects' behaviors. The expectancy-value model however, has been identified as one of the most comprehensive motivational models for explaining academic and career choices (Wigfield & Eccles, 2000).

In further refinement of the theory, Jacobs and Eccles (2000) found that expectancies for success are defined as students' beliefs about how well they will do on upcoming tasks, either in the immediate or long term future. In the formulation of the expectancy-value theory, values and ability beliefs, or expectancies for success, are the most important motivations that predict academic choices and behaviors (Eccles et al, 1983). According to some modern expectancy-value theories, an individual's values for a particular goal and task can help explain why a student chooses one career over another Jacobs and Eccles (2000) further explained the theory:

> According to the expectancy-value model, the key determinants of choice will be the relative value and perceived probability of success of each available option. Expectancies and values are assumed to directly influence performance and task choice and to be influenced by task-specific beliefs such as self-perceptions of competence, perceptions of the task demands, and the child's goals and self-schemas (p. 406).

To date, the expectancy-value model has been used to understand the motivations that trigger individuals' behaviors and is one of the major frameworks for achievement motivation (Atkinson, 1957). This theory proposes that if one can identify the factor or factors that impact an individual's intention, then it can be predicted that an individual will engage in a particular behavior. The basis of the theory is that individuals choose behaviors based on the outcomes they expect and the values they ascribe to (Borders, Earleywine, & Huey, 2004). Additionally, expectancies for success are defined by beliefs about how successful a subject will do on a given task and their individual values for a particular task. These beliefs can help explain why they choose one task over another (Jacobs & Eccles, 2000).

In teacher preparation and professional development programs, this theory aids to answering the motivational question about what makes pre-service and existing teachers want to do a certain task or "teach certain agricultural education curriculum." An individuals' motivation is determined by how much they value the goal (or task), and whether they expect to succeed. Jacobs and Eccles (2000) emphasized the distinct contribution that is made by individual beliefs, expectations for success, and the value of the task and its influence on achievement and choice. The model for the Expectancy-Value Theory (Wigfield & Eccles, 2000) is displayed in Figure 5.

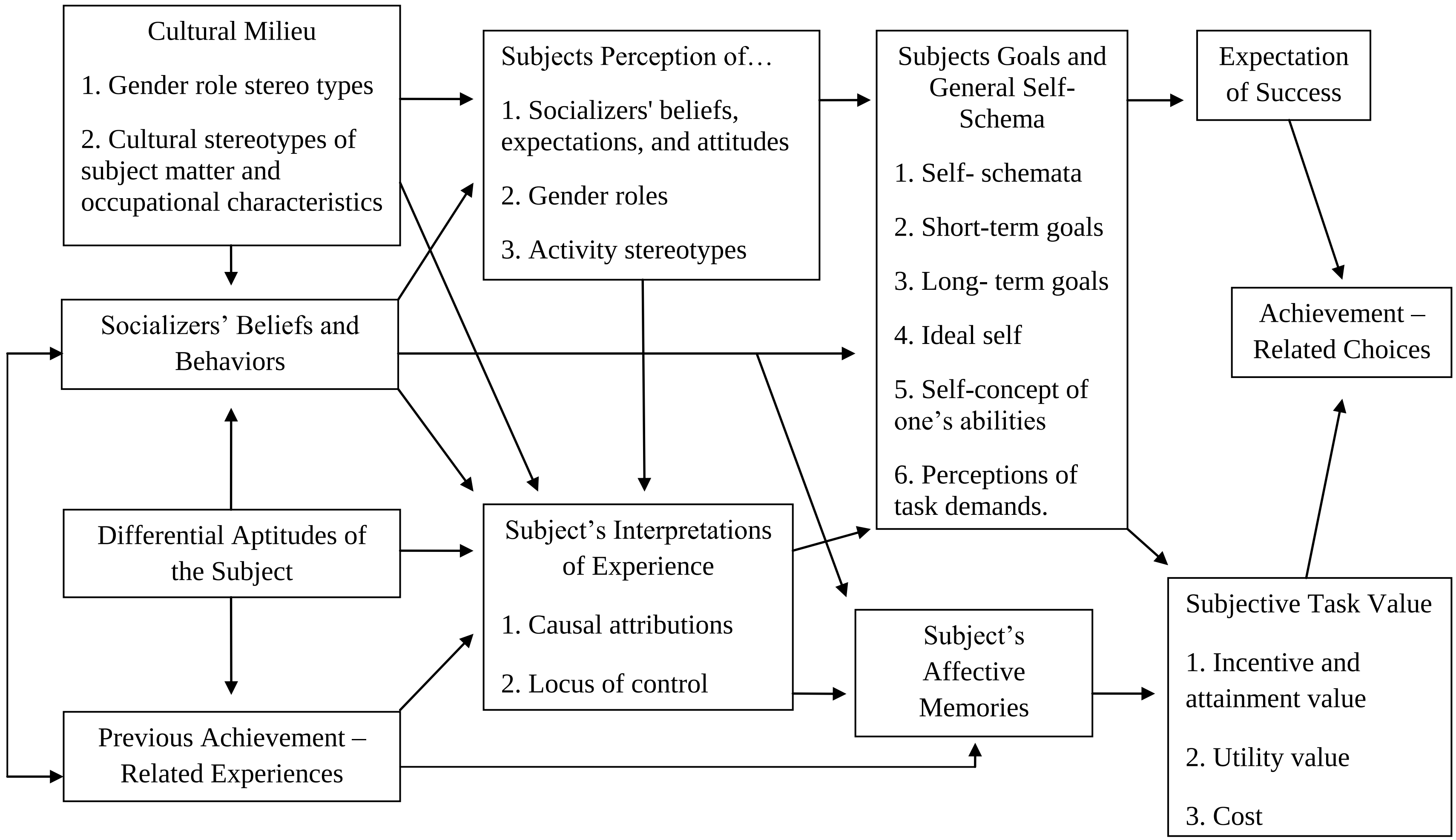

Figure 5. Expectancy – Value Theory of Achievement Motivation (Wigfield & Eccles, 2000).

Bandura's Theory of Self-Efficacy

Bandura's Theory of Self-Efficacy has its theoretical roots in Bandura's Social Cognitive Theory (Bandura, 1997). According to Bandura (1997), self-efficacy is defined as the "beliefs in one's capabilities to organize and execute the course of action required to produce given attainments" (p. 3). Moreover, self-efficacy influences a person's choices, actions, the amount of effort they give, how long they persevere when faced with obstacles, their resilience, their thought patterns and emotional reactions, and the level of achievement they ultimately attain (Bandura, 1986). Gist and Mitchell (1992) found that some differences in self-efficacy may be associated to the skill level of the subject; however, differences in personality, motivation, and the task itself may also influence efficacy perceptions. Furthermore, self-efficacy is a belief about what one is capable of doing; however, it is not the same concept as knowing what to do (Schunk, 2004). Please see Figure 5 for a model of Bandura's Theory of Self-Efficacy.

According to Bandura (1986, 1997), there are four sources of efficacy expectations. These include mastery experiences, psychological experiences, vicarious experiences, and social persuasion. Mastery experiences are the most powerful source of efficacy and are related to previous successful performances; thus, if you successfully performed a task in the past, you are more likely to feel positive about performing the same task in the future. Psychological experiences such as level of arousal (anxiety or excitement) concerning the task can also affect a subjects efficacy level. Vicarious experiences are those in which the task in question is modeled by someone else prior to an attempt by the subject (Tschannen-Moran, Woolfolk-Hoy, & Hoy, 1998). The closer the subject identifies, or learns, from the modeled behavior, the stronger the impact will be on the subject; thus, a higher level of efficacy of completing the task in the future may be obtained by the subject (Bandura, 1977). Finally, social persuasion can also increase a subject's level of efficacy toward performing a task. Bandura (1982) found that social persuasion (pep talk or positive encouragement) can contribute to a successful performance. A persuasive, positive boost can lead a person to initiate a task, attempt new strategies, or try hard enough to succeed.

There are three overarching principles that guide the comprehension of self-efficacy. First, self-efficacy is considered to be a comprehensive summary or judgment of perceived capability for executing a specific task. Second, self-efficacy is a dynamic construct that changes over time due to the acquisition of new information and experiences. Finally, efficacy beliefs involve a more complex and generative process that requires the construction and development of adaptive performance to comply with the actual or changing circumstances (Bandura & Wood, 1989; Rodriguez, 1997; Wood & Bandura, 1989).

In the field of education, Teacher Self-Efficacy is an important concept of teacher motivation (Knobloch & Whittington, 2002b). In 1998, Tschannen-Moran et al. defined teacher efficacy as "the teacher's belief in his or her capability to organize and execute courses of action required to successfully accomplish a specific teaching task in a particular context" (p. 233). Miller, Kahler, and Rheault (1991) found that motivated and confident agriculture teachers were more effective and are more likely to display a disposition that all students can learn (Darling-Hammond, 1999; NCATE, 2001). When teachers were more motivated and confident, students achieved more in the classroom, were more motivated, and had a greater sense of efficacy (Ashton & Webb, 1986; Guskey & Passaro, 1994). Moreover, teacher efficacy was related to teachers' behavior, effort, innovation, planning and organization, persistence, resilience, enthusiasm, willingness to work with difficult students, and commitment to teaching and their careers (Knobloch & Whittington, 2002b; Tschannen-Moran et al., 1998).

Teachers in each career stage have various levels of self-efficacy (Knobloch & Whittington, 2002a). This fact especially affects the performance of early career or novice teachers. Knobloch and Whittington (2002a) found that novice teachers who had technical, professional, and pedagogical knowledge felt more efficacious to teach technical agriculture education courses. In 1999, Darling-Hammond identified several variables that were indicative of a teachers' competence that included subject matter knowledge and knowledge of teaching and learning. Furthermore, novice teachers also felt that teaching experience made them feel more confident, whereas, the lack of teaching experience made them feel less confident (Knobloch & Whittington, 2002a). The old adage, experience is the best teacher, seems to fit for novice teachers because it combines technical knowledge and practical judgment into application (Field & Macintyre-Latta, 2001). In conclusion, Bandura (1997) suggested that mastering a performance, such as teaching, through experience is one of the most powerful influencers of self-efficacy. See Figure 6 for a visual explanation of this theory.

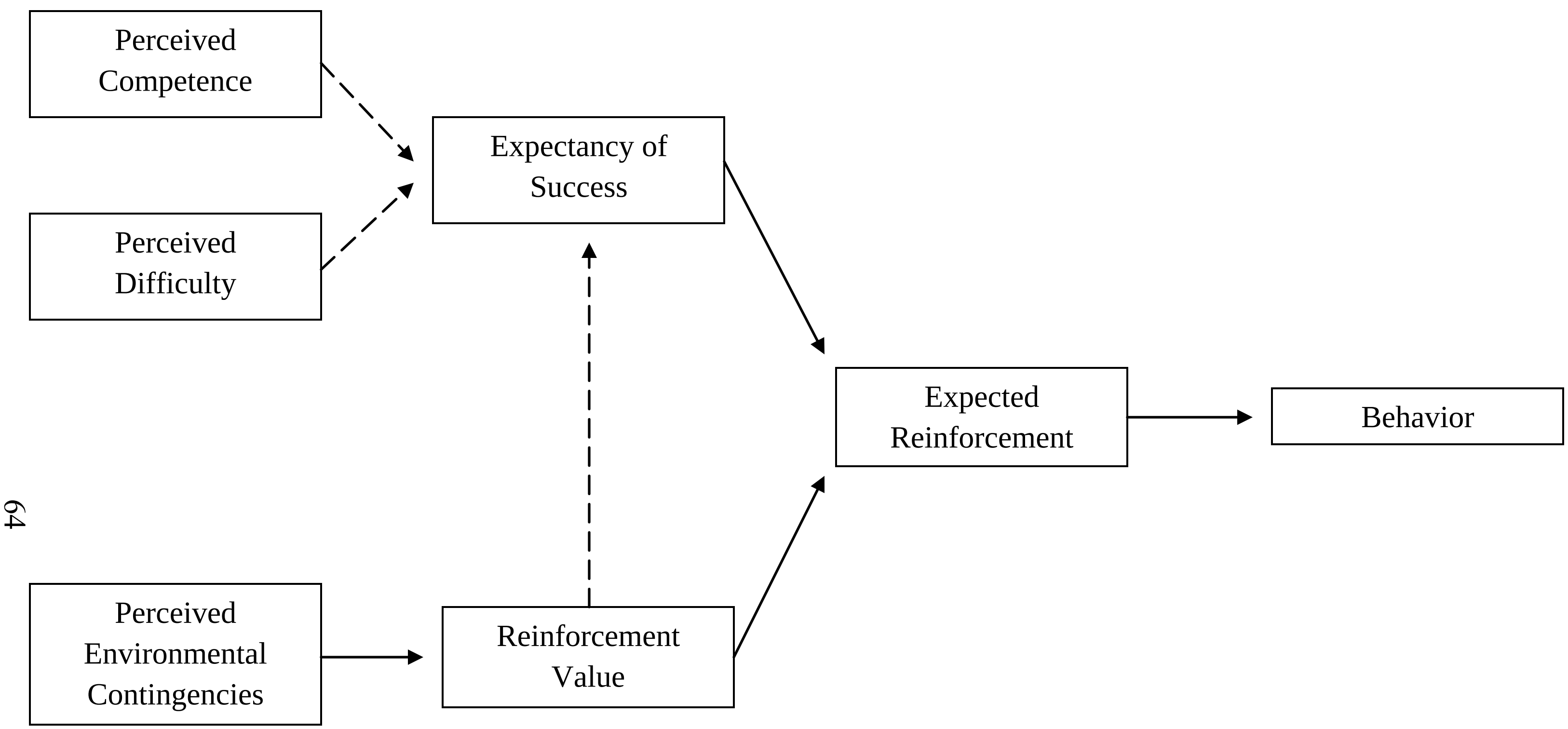

Figure 6. Theory of Self-Efficacy (Bandura, 1997).

Summary

Agricultural mechanics has been and continues to be a very popular school-based agricultural education course and career path for many students in Missouri (Missouri Department of Elementary and Secondary Education, 2010). However, recent research shows that teachers in this state and across the country lack the fundamental technical skills and experience to successfully instruct agricultural mechanics courses and safely supervise those associated laboratories (Burris et al., 2005; Hubert et al., 2003; McKim, Saucier, & Reynolds, 2010; Saucier et al. 2008; Saucier et al. 2009; Saucier, McKim, Murphy, & Terry, 2010; Saucier et al. 2010). The lack of technical skills and experience has resulted in a deficit of fully qualified teachers to instruct school-based agricultural mechanics courses. By understanding the influential factors that guide teachers' decisions to instruct, or not to instruct, certain aspects of the agricultural mechanics curriculum, researchers can utilize these results to modify existing teacher certification programs and develop future educational opportunities.

The knowledge of these factors can influence teacher development at all career stages. By understanding these factors, Missouri professional development specialist can tailor professional development education programs to meet teachers' ever-changing continuing education needs. Due to the current lack of research regarding the factors that influence school-based agriculture teachers to instruct agricultural mechanics course curriculum, the continual need to determine the professional development needs of agriculture educators (Osborne, 2007), and the lack of research in the area of school-based agricultural mechanics, the researcher determined that this study is timely and warranted.

CHAPTER THREE

METHODOLOGY

This chapter is a presentation of the procedures and methods used to collect, measure, and analyze data. Specifically, the research design, frame, and sampling are addressed. In addition, instrumentation, including validity and reliability, are discussed. Finally, a summary of the data analysis for each research question is presented.

Purpose of the Study

The purpose of this study was to describe factors that influence Missouri school-based agriculture teachers' choice to teach specific components of the Agricultural Construction 1 and/or Agricultural Construction 2 curriculum.

Research Questions

The following research questions were developed to guide this study:

1. What are the personal, professional, and program characteristics (age, sex, years of teaching experience, type of teacher certification, university semester credit hours earned in agricultural mechanics, student enrollment in a school-based agricultural education program , time spent supervising student agricultural mechanics Supervised Agricultural Experience (SAE) projects per week, student participation in agricultural mechanics related events, university from which undergraduate degree was earned, FFA area in which school of employment is located, and satisfaction with the teacher education program from which certification was earned regarding preparation to teach agricultural mechanics) of school-based agricultural educators in Missouri who teach Agricultural Construction 1 and/or Agricultural Construction 2?
2. Which of the selected components of the Agricultural Construction 1 and/or Agricultural Construction 2 curriculum do Missouri school-based agricultural educators teach?
3. What factors influence Missouri school-based agricultural educators' decisions to teach selected curriculum components in Agricultural Construction 1 and/or Agricultural Construction 2?
4. Does a relationship exist between and among teachers' choice to teach selected components of the Agricultural Construction 1 and/or Agricultural Construction 2 curriculum, the self-perceived factors that influence teachers decision to teach selected components of the Agricultural Construction 1 and/or Agricultural Construction 2 curriculum, and their personal, professional,

and program characteristics (age, sex, years of teaching experience, university semester credit hours earned in agricultural mechanics, student enrollment in a school-based agricultural education program, type of teacher certification, and time spent supervising student agricultural mechanics SAE projects per week)?

Research Design

This study utilized descriptive and correlational research methods. Consistent with the literature on research design, a tailored, electronic approach of data collection was employed using an online, web based instrument to gather information necessary to accomplish the purpose and objectives of the study (Dillman, 2007). Descriptive research methods were used to "describe situations and events" in this study (Issac & Michael, 1987, p. 46). Gall, Gall and Borg (2003) stated that "many research studies involve the description of natural or social phenomena – their form, structure, activity, change over time, relationship to other phenomena" (p. 3). Such studies focus primarily on describing existing conditions (Gall et al.). According to Issac and Michael (1987), descriptive research includes all forms of research except historical or experimental research. Furthermore, Ary, Jacobs, and Razavieh (2002), explained that often this type of research "uses…questionnaires and interviews to gather information from groups of subjects" (p.25). Consistent with the literature on research design, this study employed the use of an online instrument to gather information regarding academic advising needs, preferences, and experiences. Correlational research methods were used to investigate potential relationships between variables of interest (Gall, Gall, & Borg, 2003). Correlational research was used to address the magnitude and direction of relationships among selected variables (Ary, Jacobs, & Razavieh, 2002).

Gall, Gall, and Borg (2003) stated that "much educational research has a strong inclination toward discovering cause-and-effect relationship" (p. 290); however, such causation is not the purpose of this study. In fact, as Gall, Gall and Borg (1996) explained, "unless researchers first generate an accurate description of an educational phenomenon as it exists, they lack a firm basis for explaining or changing it" (p. 374). In this study, there were ten dependent variables: (1) Importance the teacher placed on teaching the selected components of the Agricultural Construction 1 and/or Agricultural Construction 2 curriculum; (2) Importance the community placed on the teacher teaching the selected components of the Agricultural Construction 1 and/or Agricultural Construction 2 curriculum to students, (3) Importance the students placed on being taught the selected components of the Agricultural Construction 1 and/or Agricultural Construction 2 curriculum, (4) Importance that the administration places on the teacher teaching the selected components of the Agricultural Construction 1 and/or Agricultural Construction 2 curriculum to students, (5) Teacher's ability to teach the selected components of the Agricultural Construction 1 and/or Agricultural Construction 2 curriculum to students, (6) Teacher's personal interest in teaching the selected components of the Agricultural Construction 1 and/or Agricultural Construction 2 curriculum to students, (7) Teacher's experience in teaching the selected components of the Agricultural Construction 1 and/or Agricultural Construction 2 curriculum to students, (8) Facilities available to the teacher to teach the selected components of the

Agricultural Construction 1 and/or Agricultural Construction 2 curriculum to students, (9) Equipment available to the teacher to teach the selected components of the Agricultural Construction 1 and/or Agricultural Construction 2 curriculum to students, and (10) Budget available to teach the selected components of the Agricultural Construction 1 and/or Agricultural Construction 2 curriculum to students.

In addition, there were several independent variables of interest. These variables of interest include: age, sex, the number of agricultural mechanics semester credit hours completed at the university level, years of teaching experience, current student enrollment in a school-based agricultural education program of the agricultural education program, type of teacher certification, and the average number of hours per week spent supervising agricultural mechanics SAE projects.

As with all descriptive research, there are two primary concerns that must be addressed, internal and external validity. Internal validity ensures that the data, or findings, are true. To ensure internal validity, measurement error must be minimized and the instrument used for data collection must be trusted. External validity addresses the question, to whom can the findings be generalized? Factors that influence external validity of a study include sampling error, selection error, frame error, and non-response error. Internal validity concerns will be addressed in the instrumentation section.

Population and Sampling

Population

The target population consisted of all school-based agriculture teachers in Missouri who at the time of the study taught Agricultural Construction 1 and/or Agricultural Construction 2 (*N* = 257). The frame for this study was obtained from the *2009-2010 Missouri Agricultural Education Directory*, published by the Missouri Department of Elementary and Secondary Education. To arrive at the target population, all Missouri school-based agriculture teachers (*N* = 494) were surveyed to determine if they taught Agricultural Construction 1 and/or Agricultural Construction 2. This group was contacted up to seven times using a modified Tailored Design Method (Dillman, 2007). The initial contact was an e-mail pre-notice. Next, there were up to five e-mail invitations for participants to complete the online data collection instrument. Finally, a phone call was placed to non-respondents to urge them to give them one final opportunity to complete the questionnaire. This process yielded a response rate of 94% (*n* = 464). Of those who responded, 257 (55%) of the agriculture teachers indicated that they teach Agricultural Construction 1 and/or Agricultural Construction 2. This group formed the population frame for this research.

A census of the population was used for three reasons. First, all teachers were accessible because of the availability of their school e-mail addresses from the *2009-2010 Missouri Agricultural Education Directory* (Missouri Department of Elementary and

Secondary Education, 2009). Second, by distributing the instrument to teachers online, cost was not a factor. Finally, the number of subjects in the population was manageable.

To address potential frame error and ensure frame accuracy, the list of subjects was scrutinized by the researcher for (frame) errors of omissions and duplicate names (selection error). Names of teachers, school locations, school addresses, school phone numbers, and e-mail addresses were reviewed to make certain that the information was correct.

Instrumentation

Data were collected through one primary method, a researcher-designed, web-based questionnaire. A web-link to the instrument, titled the Missouri Agricultural Mechanics Assessment (Appendix A), was distributed to all subjects to obtain quantitative information seeking to uncover factors that influence teachers to teach the curriculum found within the course Agricultural Construction 1 and/or Agricultural Construction 2. A web-based instrument was utilized due to the advantages it offers over other data collection methods in terms of timeliness of responses, ease of data analysis, and reduced expense.

The questionnaire was developed by the researcher and distributed using Hosted Survey™, a web-hosted software application. Hosted Survey™ was selected due to affordable academic pricing, flexibility in question formatting and design options, and excellent customer service.

The Missouri Agricultural Mechanics Assessment consisted of two sections. Section I was composed of questions related to the instruction of six skill-related curriculum areas included in the Agricultural Construction 1 and/or Agricultural Construction 2 curriculum. This section also contained questions relating to the factors that influence, or do not influence, a teacher to teach the selected components of the curriculum. The six selected skill-related curriculum areas found within the course Agricultural Construction 1 and/or Agricultural Construction 2 included: Arc Welding, Project Construction, Oxy-Gas and Other Cutting/Welding Processes, Woodworking, Metals, and Finishing (University of Missouri 2010.)

Regarding each selected curriculum area, teachers were asked whether or not they taught all or part of the curriculum. Based upon their response, either yes or no, the respondent was then directed to a separate page of the instrument. If the response was yes, participants were provided a list of ten factors to consider regarding their decision to teach that component of the curriculum. If the response was no, participants were provided the same list of ten factors to consider regarding their decision not to teach that component of the curriculum. These ten factors, developed from the Theory of Planned Behavior (Ajzen, 1991), the Theory of Self-Efficacy (Bandura, 1997), and the Expectancy Value Theory of Achievement Motivation (Atkinson, 1957), included: Personal Importance, Personal Interest In Teaching, Equipment Available To Teach, Facilities Available To Teach, Experience In Teaching, Personal Ability To Teach, Budget Available To Teach, Student Importance, Community Importance, and Administration Importance. A five-point, Likert-type scale was offered for respondents to provide information about factors that influence their decision to teach, or not to teach, a curriculum component. The response scale for each factor was: 0 = no influence, 1 = little influence, 2 = some influence, 3 = moderate influence, and 4 = great influence. Finally, subjects were asked to determine the number of days they spent teaching each of the six skill-related curriculum areas of Agricultural Construction 1 and/or Agricultural Construction within a typical academic year.

Section II of the instrument consisted of ten questions designed to collect information on personal, professional and program information of the respondents and the school-based agricultural education program in which they teach. As a release, respondents were also given an opportunity to write any additional comments concerning the teaching of Agricultural Construction 1 and/or Agricultural Construction 2, the agricultural mechanics curriculum in Missouri, factors that influence you to teach certain agricultural mechanics topics, or any other topic that they find of importance that was not addressed in the instrument.

Accounting for Measurement Error

In research and data collection, a researcher must make a concerted effort to reduce error. Unfortunately, measurement error can never be entirely eliminated. However, by recognizing that both random and systematic type error exist in measurements, error can be minimized. In this particular study, several steps were taken to control for systematic error by addressing the issues of validity and reliability.

Validity of the Missouri Agricultural Mechanics Assessment.

Validity is "the most important characteristic a test or measure can have" (Gay & Airasian, 2000, p. 169). Furthermore, "validity in quantitative research depends on careful instrument construction to ensure that the instrument measures what it is supposed to measure" (Patton, 2002, p. 14). For this study, face and content validity were used to determine the validity of the online Missouri Agricultural Mechanics Assessment instrument.

Face validity is simply asking the question, does this instrument appear to be valid for the intended purpose? According to Ary, Jacobs, and Razavieh (2002), determining face validity is especially important because respondents are more likely to complete an instrument that appears to be meaningful and appropriate. Content validity suggests that the instrument measures what it purports to measure. Essentially, validity is the assumption that the intended measurement was indeed measured by the instrument.

To ensure the instrument was carefully constructed with an effect to minimize systematic error, a panel of experts reviewed the instrument and addressed face and content validity. The panel of experts consisted of three university faculty members familiar with agricultural education curriculum at the secondary level, two university faculty members familiar with agricultural mechanics curriculum at the secondary level, one university faculty member familiar with research design and instrument development, and one graduate student with previous experience teaching school-based agricultural education (See Appendix B).

In late September 2009, panel members were sent a letter via e-mail (Appendix C) asking for their assistance in addressing the validity of the instrument. Attached to the e-mail were three documents describing the purpose and research questions of the study (Appendix E), a comments page (Appendix F), and the curriculum standards for Agricultural Construction 1 and/or Agricultural Construction 2 (Appendix D). The purpose and research objectives of the study were included so that the expert panel members could familiarize themselves with the overall purpose of the study prior to providing feedback regarding content validity. A separate e-mail with a link to the web-based instrument at Hosted Survey™ was also provided so that expert panel members could determine face validity. Specifically, panel members were asked to comment on the instrument design, clarity of instructions, word choice, ambiguity, and whether or not they agreed with the wording of the competencies. Collectively, these reduce systematic error. Based on the suggestions provided by the panel of experts, the instrument was updated and prepared for a pilot test.

Pilot testing

Pilot testing is often used to determine the reliability of an instrument. Ary, Jacobs, and Razavieh (2002), stated that reliability is “concerned with the extent to which the measure would yield the same results each time it is used” (p. 227). Furthermore, reliability suggests an instrument offers consistent measurement (Ary, et al., 2002). According to Gall, Gall and Borg (2005), “it is impossible to predict how the items will be interpreted by respondents unless the researcher tries out the questionnaire and analyzes the responses of a small sample of individuals before starting the main study" (p. 133). Similarly, Ary, et al. supported such pilot testing, or field testing, because of the potential ability for such efforts to help clarify or eliminate items. Ary et al. continued support of pilot testing by offering the following questions that can be addressed:

1. Do the respondents seem comfortable with the questionnaire and motivated to complete it?
2. Are certain items confusing?
3. Could some items result in hostility or embarrassment on the part of the respondents?
4. Are the instructions clear?
5. How long will it take a respondent to complete the questionnaire?
6. Do all respondents interpret the items in the same way? (p. 402)

Prior to distributing the online instrument to the target population, a pilot study was conducted with 23 school-based agriculture teachers in Kentucky. These teachers were selected by an agricultural education faculty member from Murray State University because of their similarity to the target population, their familiarity with agricultural mechanics curriculum, and their current teaching assignment of the Kentucky agricultural education course entitled Agricultural Construction Skills.

Members of the pilot group were asked, via e-mail, to complete the instrument and share their concerns and/or suggestions for improvement. Of the 23 teachers contacted, 22 (96%) completed all items in Sections I and II.

Some modifications were made to the instrument as result of the pilot test and comments made by these respondents. Additional clarification was made to the instrument instructions and format of the instrument. Furthermore, a more accurate time estimate for completion of the instrument estimated as result of the comments provided by the teachers in the pilot test group.

Reliability of the Missouri Agricultural Mechanics Assessment.

Reliability refers to the consistency of measures produced by measuring an instrument (Ary, Jacobs, & Razavieh 2002). Borg and Gall (1989) defined reliability as the “stability of the measuring device over time” (p. 257). While often difficult to design a measure that is perfectly reliable, efforts by the researcher must be made to determine the reliability of an instrument, and if possible, increase the reliability. There are a variety of methods utilized for determining the reliability of a measuring instrument, many of which involve computing a correlation coefficient between two sets of measurements (Borg & Gall). Miller, Torres, and Lindner (2004) noted that “a measure of reliability can also be obtained using a single administration of an instrument” (p. 14) by determining internal consistency. However, an instrument “can be reliable without being valid; but it cannot be valid unless it is first reliable” (Ary, Jacobs, Razavieh, & Sorensen, 2006, p.

256). That being said, the reliability must be established by using an appropriate analysis method (Ary et al., 2006).

For this study, reliability coefficients for the constructs found within Section I was calculated using the pilot test data. *Cronbach's alpha,* the most common form of internal consistency as an estimate for reliability, was used. Miller, Torres, and Lindner (2004) noted that *Cronbach's alpha coefficient* can be used when items have multiple response categories such as the Likert-type response categories present in the first section of the questionnaire used in this study, are summatable, and "will provide an appropriate estimate of reliability" (p. 15). As shown in Table 1, the resulting Cronbach's alpha coefficients ranged from .73 to .91. According to Garson (2008), .70 is often noted as the lower limit for an acceptable Cronbach's alpha coefficient for a set of items in social science research. Nunnelly (1978) also identified .70 as the level at which a scale may be considered internally consistent. Based on the resulting coefficients, the constructs found within Section I of the Missouri Agricultural Mechanics Assessment was deemed reliable.

Table 1
Reliability Estimates of the Missouri Agricultural Mechanics Assessment (n = 22)

Construct	Level of Influence
Arc Welding	.73
Project Construction	.87
Oxy-Gas and Other Cutting/Welding Processes	.76
Woodworking	.87
Metals	.91
Finishing	.87

Section II of the Missouri Agricultural Mechanics Assessment asked subjects to provide personal, professional, and program information. The demographic information requested included: age, sex, years of teaching experience, type of teacher certification, university semester credit hours earned in agricultural mechanics, student enrollment in a school-based agricultural education program , time spent supervising agricultural mechanics SAE program projects per week, student participation in agricultural mechanics related events, university in which you received your undergraduate degree, FFA area in which your school is located, and satisfaction with the teacher education program in which you were certified from regarding the preparation you received to teach agricultural mechanics. In accordance with the recommendations of Salant and Dillman (1994), reliability estimates were not calculated on demographic data because very little measurement error results from asking respondents about personal attributes and behaviors.

Institutional Approval

After the data collection instrument was developed, but prior to implementation of the data collection process, the researcher submitted a proposed plan outlining the data collection process and all related materials to the University of Missouri Institutional Review Board (IRB). The data collection process began after receiving approval from IRB, project number 1150258, and followed the requirements and specifications set forth in the approval notice.

Data Collection

A modified version of the Dillman (2007) Tailored Designed Method for Internet Surveys was utilized to guide the data collection process of this study. Typically, this method is employed for mailed instruments and includes up to five potential contacts including: first contact - a pre-notice letter, second contact - the instrument mail out, third contact - a postcard thank you/reminder, fourth contact - the first replacement instrument, and fifth contact - the invoking of special procedures (Dillman). Because this instrument was delivered using the Internet, the five contacts were modified slightly. For this study, subjects were contacted up to five potential times through electronic mail from the researcher. Responses from participants were coded for follow up to facilitate a higher response rate. E-mail messages were personalized in accordance with Dillman's recommendation that "sampled individual should receive an individualized e-mail message that contains the questionnaire" (p.368). The researchers followed these recommendations and contacted the respondents five times throughout the study. The first contact (Appendix G) with respondents was an e-mail message sent three days prior to the beginning of the data collection period on October 26, 2009. In this e-mail, an overview of the research was provided and subjects were asked to participate in the study. Subjects were also given the opportunity to access the web-based questionnaire immediately using a uniform resource locator (URL) link provided in the message. The e-mail also provided contact information for those involved in the study and explained that participation in the study was voluntary, in accordance with University of Missouri IRB policies. Subjects were given the option of using a paper instrument, if preferred. No subjects selected this option. The second contact (Appendix H) occurred on October 29, 2009. In this e-mail message, subjects were provided a link to the web-based questionnaire, which included a detailed cover letter explaining the importance of their participation in the study.

According to Dillman (2004), a survey that fails to have follow-up contact with the respondents typically has response rates that are substantially lower than those obtained with follow-up. Therefore, a third contact was made on November 2, 2009 in the form of an e-mail with an URL link to a replacement web-based questionnaire that was sent to the non-respondents 4 days after the previous questionnaire mailing. This contact included a detailed cover letter (Appendix I), explaining the importance of a response and indicated that the person's completed questionnaire had not yet been received and urged the recipient to respond. However, the third contact in this study was written in such a way as not to "overcome resistance, but rather to jog memories and rearrange priorities" (Dillman, 2004, p. 179). A teacher receives numerous e-mails each day and has a multitude of activities and assignments to balance as Dillman indicated, therefore, high nonresponse is more often due to simple oversight than to conscious refusal.

The fourth contact (Appendix J), with the respondents occurred three days after the third contact. On November 5, 2009, members of the population who had not yet responded were contacted via e-mail. The fact that there was an incentive enticement for participants, a chance to win $100 cash in a drawing, was highlighted in this message. They were encouraged to complete the questionnaire prior to the end of the data collection period, November 13, 2009, so that they might be included in the drawing for the gift card. At this time, respondents who had completed the questionnaire were extended a message of appreciation and were notified of the incentive.

On November 6, 2009, or one day after the previous contact, a fifth contact (Appendix K), was made with non-responding subjects. In this contact, a cover letter explaining the importance of their participation in the study (Appendix K) and a URL link to the questionnaire were included. On November 9, 2009, the final contact was made with non-respondents. In this final e-mail, non-respondents were urged to complete the questionnaire and given a URL link to the questionnaire.

Due to the follow-up options provided by Hosted Survey™, an additional e-mail was sent to respondents who began the instrument, but failed to complete it. Instrument features allowed these respondents to begin the instrument from where they last left off rather than requiring them to start over. Teachers who completed the entire instrument immediately were sent a confirmation e-mail thanking them for their participation and an explanation about how the incentive drawing would be carried out.

As explained above, a financial incentive was offered to encourage teacher participation. Respondents were entered into a drawing to win $100 cash. While this financial incentive does not align with Dillman's (2004) suggestion of providing an incentive with the instrument, this option seemed to be most logical when conducting a web-based instrument. Following the end of data collection period, one respondent was randomly selected to receive the $100 cash. To ensure a fair process of selection, Randomizer.org (Urbaniak & Plous, 1997) was utilized to generate one number that corresponded with a respondent. In accordance with IRB policies and campus accounting procedures, the cash incentive was stored in the Agricultural Education Department under lock and key until distributed. The teacher, who received the cash, was contacted via phone to ensure that they had received the incentive. Finally, 203 (79%) Missouri agricultural educators provided usable responses for this study.

Data Analysis

Data were analyzed using the statistical Package for the Social Sciences® (SPSS) 17.0 for Windows and Microsoft Office Excel® 2007. Data analysis methods were selected as a result of determining the scales of measurement for the variables measured.

Research Questions

Research Question One – Demographic Characteristics of the Respondents

The first research question was: What are the personal, professional, and program characteristics (age, sex, years of teaching experience, type of teacher certification, university semester credit hours earned in agricultural mechanics, student enrollment in a school-based agricultural education program , time spent instructing agricultural mechanics per week, student participation in agricultural mechanics related events, university in which you received your undergraduate degree, and satisfaction with the teacher education program in which you were certified from in regarding the preparation you received to teach agricultural mechanics) of school-based agricultural educators in Missouri? Descriptive statistics were used to describe data associated with this research question. More specifically, frequency counts and percentages were used to adequately describe nominal and ordinal data. Measures of central tendency and variability, in relation to the demographics, were also calculated.

Research Question Two – Curriculum Components of Agricultural Construction 1 and/or Agricultural Construction 2 Taught By Missouri Agriculture Teachers

The second research question was: Which of the selected components of the Agricultural Construction 1 and/or Agricultural Construction 2 curriculum do Missouri school-based agricultural educators teach? Descriptive statistics were used to describe data associated with this research question. More specifically, frequency counts and percentages were used to adequately describe nominal and ordinal data.

Research Question Three – Level of Perceived Influence Selected Factors Have On Missouri School-based Curriculum Instruction

The third research question was: What factors do subjects perceive influence Missouri school-based agricultural educators' decisions to teach selected curriculum components in Agricultural Construction 1 and/or Agricultural Construction 2? Descriptive statistics were reported to address research question three, and analyze the characteristics of school-based agriculture teachers in Missouri. More specifically, frequency counts and percentages were used to adequately describe nominal and ordinal data. The researcher also calculated the measures of central tendency and variability in relation to the characteristics. Results of the influence of each factor were analyzed with the following scale: 0 to .50 = No Influence, .51 to 1.50 = Little Influence, 1.51 to 2.50 = Some Influence, 2.51 to 3.50 = Moderate Influence, 3.51 to 4.00 = Great Influence.

Research Question Four – Relationships of Curriculum Choice, Influential Factors, and Characteristics of the Respondents

The fourth research question was: Does a relationship exist between and among teachers' choice to teach selected components of the Agricultural Construction 1 and/or Agricultural Construction 2 curriculum, the factors that influence teachers decision to teach selected components of the Agricultural Construction 1 and/or Agricultural

Construction 2 curriculum, and their personal, professional, and program characteristics (age, sex, years of teaching experience, university semester credit hours earned in agricultural mechanics, student enrollment in a school-based agricultural education program , and time spent supervising student SAE agricultural mechanics projects per week)? To address research question four, simultaneous multiple linear regressions were utilized.

According to Thalheimer and Cook (2002), Cohen's *d* is frequently preferred over other methods for measuring effect size. Not only is it becoming the standard based on its growing popularity in academic research, it also allows for an immediate comparison (Thalheimer & Cook, 2002). Effect sizes were calculated using Soper's (2010) effect size calculator (see Appendix K) and interpreted according to Thalheimer and Cook's (2002) effect size descriptions (see Table 2).

Table 2

Descriptors for Describing the Effect Size of Cohen's d

Value of Cohen's *d*	Effect Size
> 1.45	Huge effect
> 1.10 and < 1.45	Very large effect
> 0.75 and < 1.10	Large effect
> 0.40 and < 0.75	Medium effect
> 0.15 and < 0.40	Small effect
> - 0.15 and < 0.15	Negligible effect

Note. Descriptors for Describing Effect Size of Cohen's *d* (Thalheimer & Cook, 2002)

According to Studenmund & Cassidy (1987), a Simultaneous Multiple Linear Regression (SMLR) is the only appropriate method appropriate for theory testing due to random variation in the data. Field (2009) stated that the SMLR is a method in which all predictors are forced into one model simultaneously. He further stated that for this model to work, good theoretical reasons for including the chosen predictors must be utilized. For this study, a SMLR was used to explain the relationships between each of the summated dependent variables, Importance of Teaching and Teacher Self -efficacy, and the seven independent variables, i.e.: age, sex, years of teaching experience, type of teacher certification, university semester credit hours earned in agricultural mechanics, student enrollment in a school-based agricultural education program, and time spent per week supervising student agricultural mechanics SAE projects. An *a priori* alpha level was set at .05 for this study. To ensure that a proper sample size was established for this SMLR, the researcher adhered to Tabachnick and Fidell (2001) recommendations for testing R ($n \geq 50 + 8$ k) and for b coefficients ($n \geq 104 + k$).

As displayed in Appendices R and S, the tests for the assumptions of multiple linear regression used in the study. The tests included:

1. Linear relationships between independent variables and dependent variables

2. Test of multicollienarity

3. Visual inspection for homoscedasticity (Appendix S)

4. Normality of the residuals of the independent variables

When inspecting the test for multicollinearity of bivariate correlations, the variance inflation factor (VIF) was used. According to Myers (1990), a VIF of 10 or more should start raising caution concerning the linear relationship of the predictors. For this study, the researcher utilized this recommended level.

CHAPTER FOUR

FINDINGS

Chapter four is a report of the findings of the study. A description of the results of the data analysis is reported for each of the research questions.

Purpose of the Study

The purpose of this study was to determine the factors that influence Missouri school-based agriculture teachers' choice to teach specific components of the Agricultural Construction 1 and/or Agricultural Construction 2 curriculum.

Research Questions

The following research questions were developed to guide this study:

1. What are the personal, professional, and program characteristics (age, sex, years of teaching experience, type of teacher certification, university semester credit hours earned in agricultural mechanics, student enrollment in a school-

based agricultural education program , time spent supervising student agricultural mechanics Supervised Agricultural Experience (SAE) projects per week, student participation in agricultural mechanics related events, university from which undergraduate degree was earned, FFA area in which school of employment is located, and satisfaction with the teacher education program from which certification was earned regarding preparation to teach agricultural mechanics) of school-based agricultural educators in Missouri who teach Agricultural Construction 1 and/or Agricultural Construction 2?

2. Which of the selected components of the Agricultural Construction 1 and/or Agricultural Construction 2 curriculum do Missouri school-based agricultural educators teach?

3. What factors influence Missouri school-based agricultural educators' decisions to teach selected curriculum components in Agricultural Construction 1 and/or Agricultural Construction 2?

4. Does a relationship exist between and among teachers' choice to teach selected components of the Agricultural Construction 1 and/or Agricultural Construction 2 curriculum, the self-perceived factors that influence teachers decision to teach selected components of the Agricultural Construction 1 and/or Agricultural Construction 2 curriculum, and their personal, professional, and program characteristics (age, sex, years of teaching experience, university semester credit hours earned in agricultural mechanics, student enrollment in a

school-based agricultural education program, type of teacher certification, and time spent supervising student agricultural mechanics SAE projects per week)?

Results

Research Question One – Characteristics of Subjects

The first research question sought to determine the personal, professional, and program characteristics (age, sex, years of teaching experience, type of teacher certification, university semester credit hours earned in agricultural mechanics, student enrollment in a school-based agricultural education program , time spent supervising student agricultural mechanics SAE projects per week, student participation in agricultural mechanics related events, university from which undergraduate degree was earned, FFA area in which school of employment is located, and satisfaction with the teacher education program from which certification was earned regarding preparation to teach agricultural mechanics) of school-based agricultural educators in Missouri who teach Agricultural Construction 1 and/or Agricultural Construction 2. Because some of the characteristics were nominal and others were ordinal in nature, these data are reported using frequencies and percentages. For other characteristics, measures of central tendency and variability were reported.

Of the 203 teachers who participated in this study, 83.30% were male (n = 169). The mean age for teachers was 37.26 years (Median = 35.00; Mode = 28.00; Variance = 0.14; SD = 9.83; Range = 43.00). Almost one-third of the teachers were between the ages of 30 to 39 years (*n* = 64; 31.52%), followed by teachers between the ages of 40 to 49 years (*n* = 57, 28.07), the ages of 20 to 29 years (*n* = 55; 27.09%), the ages of 50 to 59 years (*n* = 25; 12.32%) and finally, teachers between the ages of 60 to 69 years (*n* = 2; 0.01%). A summary of these data are displayed in Table 3.

Table 3

Characteristics of Missouri School-Based Agriculture Teachers Who Instruct Agricultural Construction 1 and/or Agricultural Construction 2 (*n* = 203)

Characteristic	*f*	%
Sex		
Female	34	16.70
Male	169	83.30
Age (in years)		
20 – 29	55	27.09
30 – 39	64	31.52
40 – 49	57	28.07
50 – 59	25	12.32
60 – 69	2	00.01

Note. Age: Mean = 37.26 years; Median = 35.00; Mode = 28.00; Variance = 0.14; *SD* = 9.83; Range = 43.00.

Members composing the group of subjects earned their undergraduate degrees from 18 different universities. The majority of respondents graduated from the University of Missouri (*n* = 85), 21.70% graduated from Missouri State University (*n* = 44), 12.80% graduated from Northwest State University (*n* = 26), 9.40% from the University of Central Missouri (*n* = 19) and 3.00% or fewer from Arkansas State University (*n* = 6;

3.00%), College of the Ozarks (*n* = 5; 2.50%), Oklahoma State University (*n* = 3; 1.50%), Southeastern Missouri State University (*n* = 3; 1.50%), Murray State University (*n* = 2; 1.00%), and University of Arkansas (*n* = 2; 1.00%). Only one respondent graduated from each of the following universities: Fort Hays State University, Illinois State University, Kansas State University, Lincoln University, North Carolina State University, West Virginia University, Western Illinois University, Western Illinois University, and the University of Arizona. Collectively, 182 (89.66%) teachers earned their undergraduate degree from universities located in Missouri and 21 (10.34%) earned their undergraduate degree from institutions outside the state. These data are displayed in Table 4.

Table 4
Undergraduate University Attended by Missouri School-Based Agriculture Teachers (n = 203)

University	*f*	%
University of Missouri	85	41.90
Missouri State University	44	21.70
Northwest Missouri State University	26	12.80
University of Central Missouri	19	9.40
Arkansas State University	6	3.00
College of the Ozarks	5	2.50
Oklahoma State University	3	1.50
Southeastern Missouri State University	3	1.50
Murray State University	2	1.00
University of Arkansas	2	1.00
Fort Hays State University	1	0.50
Illinois State University	1	0.50
Kansas State University	1	0.50
Lincoln University	1	0.50
North Carolina State University	1	0.50
West Virginia University	1	0.50
Western Illinois University	1	0.50
University of Arizona	1	0.50

The mean age for Missouri school-based agriculture teachers was 37.27 years (Median = 35.00; Mode = 28.00; Variance = 0.14; SD = 9.83; Range = 43.00). The mean number of semester credit hours earned in agricultural mechanics courses at an undergraduate university was 10.71 (Median = 8.00; Mode = 3.00; Variance = 128.85; *SD* = 11.35; Range = 75.00). On average, Missouri school-based agriculture teachers who instruct Agricultural Construction 1 and/ or Agricultural Construction 2 had 12.66 years of teaching experience (Median = 11.00; Mode = 2.00; Variance = 82.06; *SD* = 9.06; Range = 42.00). The mean student enrollment in a school-based agricultural education program for the agricultural education program where the respondents teach was 93.71 students (Median = 80.00; Mode = 120.00; Variance = 4,275.21; *SD* = 65.39; Range = 388.00). The subjects supervised students' agricultural mechanics SAEs for an average of 4.90 hours per week (Median = 3.00; Mode = 5.00; Variance = 44.21; *SD* = 6.65; Range = 60.00). A summary of these data are displayed in Table 5.

Table 5

Personal, Professional, and Program Characteristics of Missouri School-Based Agriculture Teachers (n = 203)

	Central Tendency			Variability		
Characteristic	Mean	Median	Mode	Variance	*SD*	Range
Age	37.27	35.00	28.00	0.14	9.83	43.00
Semester credit hours earned in agricultural mechanics courses	10.71	8.00	3.00	128.85	11.35	75.00
Years of teaching experience	12.66	11.00	2.00	82.06	9.06	42.00
Student enrollment in a school-based agricultural education program	93.71	80.00	120.00	4,275.21	65.39	388.00
Hours spent supervising agricultural mechanics SAE projects	4.90	3.00	5.00	44.21	6.65	60.00

Slightly over half (*n* = 106; 52.20%) of the respondents reported that the undergraduate institution from where they graduated did not prepare them to teach school-based agricultural mechanics courses. These data are displayed in Table 6.

Table 6

Self-Perceived Preparation to Teach Agricultural Mechanics by Missouri School-Based Agriculture Teachers (*n* = 203)

Self-Perceived Preparation	*f*	%
Yes	97	47.80
No	106	52.20

Respondents were asked if they felt prepared to teach agricultural mechanics based upon the preparation they received at their undergraduate institution. If the teachers responded no, then these teachers were asked to rate their level of preparation to teach agricultural mechanics based upon the education they received at their undergraduate institution on a scale: 0 = no preparation; 1 = little preparation; 2 = some preparation; 3 = moderate preparation; 4 = excellent preparation. The mean level of preparation for these teachers who responded no to the initial question was 1.74 (Median = 2.00; Mode = 2.00; Variance = 0.54; *SD* = 0.73; Range = 3.00). A summary of these data are displayed in Table 7.

Table 7

Perceived Level of Formal Preparation to Teach School-Based Agricultural Mechanics (*n* = 106)

	Central Tendency			Variability		
Characteristic	Mean	Median	Mode	Variance	*SD*	Range
Level of preparation	1.74	2.00	2.00	0.54	0.73	3.00

Note. Levels of Preparation scale: 0 = No Preparation, 1 = Little Preparation, 2 = Some Preparation, 3 = Moderate Preparation, 4 = Excellent Preparation.

Teachers involved in this study were asked how prepared they were to teach school-based agricultural mechanics. Over half of these teachers (*n* = 60; 56.60%) indicated they had some preparation to teach school-based agricultural mechanics, followed by teachers who felt that they had little preparation (*n* = 28; 26.42%), teachers who felt that they had moderate preparation (*n* = 12; 11.32%), and teachers who felt that they had no preparation (*n* = 6; 5.66%). No teachers felt that they had excellent preparation to instruct school-based agricultural mechanics courses (*n* = 0; 0.00%). These data are displayed in Table 8.

Table 8

Perceived Level of Formal Preparation to Teach School-Based Agricultural Mechanics of Missouri School-Based Agriculture Teachers Who Indicated They Were Unprepared to Instruct Agricultural Mechanics Curriculum
(*n* = 106)

Level of Preparation	*f*	%
None	6	5.66
Little	28	26.42
Some	60	56.60
Moderate	12	11.32
Excellent	0	0.00

As shown in Table 9, more than 90% (*n* = 185; 91.10%) of the respondents reported that they hold a traditional teacher certification. The remainder of the subjects reported they have some form of alternative teacher certification (*n* = 18; 8.90%). No respondents indicated they hold any form of emergency teacher certification (*n* = 0; 0.00%).

Table 9

Type of Certification of Missouri School-Based Agriculture Teachers Who Instruct Agricultural Construction 1 and/or Agricultural Construction 2 (*n* = 203)

Teacher Certification Type	*f*	%
Traditional	185	91.10
Alternative	18	8.90
Emergency	0	0.00

In Table 10, the participation of students in agricultural mechanics related contests is reported. Nearly 90% (*n* = 179) of the teachers indicated that their students participate in one or more of the agricultural mechanics related contests investigated in this study. More than two-thirds (*n* = 138; 68.00%) of teachers reported their students participate in the FFA Agricultural Mechanics Career Development Event. Nearly two-thirds (*n* = 131; 64.50%) of the teachers indicated their students participate in county level agricultural mechanics project shows. Less than half (*n* = 91; 44.80%) of the respondents indicated that their students participated in district-level agricultural mechanics project shows. Almost half (*n* = 101; 49.80%) of the respondents reported their students participate in the agricultural mechanics project show at the Missouri State Fair. Fewer than 10% (*n* = 20; 9.90%) of the teachers stated their students participate in the Skills USA Welding Contest and fewer than 5 % (*n* = 10; 4.90%) reported their students take part in any agricultural mechanics related contest.

Table 10

Participation in Agricultural Mechanics Related Events by Missouri School-Based Agricultural Education Students (*n* = 203)

Agricultural Mechanics Event	Yes		No	
	f	%	*f*	%
Agricultural Mechanics CDE	138	68.00	65	32.00
County Level Agricultural Mechanics Project Show	131	64.50	72	35.50
District Level Agricultural Mechanics Project Show	91	44.80	112	55.20
State Fair Agricultural Mechanics Project Show	101	49.80	102	50.20
Skills USA Welding Contest	20	9.80	183	90.10
Other	10	4.90	193	95.10
None	24	11.80	179	88.20

In Table 11, the number of students enrolled in agricultural education programs, where the respondents teach, are displayed. The mean enrollment of students in an agricultural education program, in which the respondents taught, was approximately 94 students (*M* = 93.71; Median = 80.00; Mode = 120.00; *SD* = 65.38). The largest group of respondents (*n* = 78; 38.42%) indicated they had between 51 and 100 students enrolled in their agricultural education program. This was followed by 56 (27.59%) teachers who indicated that they had 0 to 50 students in their agricultural education program. Forty-three (21.18%) respondents indicated that they had 101 to 150 students enrolled; 12 (5.91%) respondents indicated that they had 151 to 200 students enrolled; 8 (3.94%) respondents indicated that they had 201 to 251 students enrolled, and 4 (1.97%) respondents indicated that they had 351 to 400 students enrolled in their agricultural education program. Only one (0.49%) respondent indicated that they had 301 to 350 students enrolled in the agricultural education program at the school in which they teach. No (0.00%) respondents indicated that they had 251 to 300 students enrolled in the agricultural education program at the school in which they teach.

Table 11

Agricultural Education Student Enrollment by Missouri School-Based Agriculture Teachers Who Instruct Agricultural Construction 1 and/or Agricultural Construction 2 (*n* = 203)

Student Enrollment	*f*	%
0 to 50	56	27.59
51 to 100	78	38.42
101 to 150	43	21.18
151 to 200	12	5.91
201 to 250	8	3.94
251 to 300	0	0.00
301 to 350	1	0.49
351 to 400	4	1.97
No response	1	0.49

Note. *M* = 93.71; Median = 80.00; Mode = 120.00; *SD* = 65.38.

In Table 12, the number of hours that teachers spent per week supervising student agricultural mechanics SAE projects is reported. The highest percentage of teachers (*n* = 147; 72.41%) indicated they spend between 0 and 5 hours per week supervising student agricultural mechanics SAE projects. Furthermore, teachers also indicated that they spent the following amount of time per week supervising student agricultural mechanics SAE projects: 6 to 10 hours (*n* = 38; 18.72%), 11 to 15 hours (*n* = 4; 1.97%), 16 to 20 hours (*n* = 4; 1.97%), and 21 to 25 hours (*n* = 3; 1.47%). This was followed by teachers who responded that they spent 26 to 30 hours (*n* = 0; 0.00%), 31 to 35 hours (*n* = 0; 0.00%), 36 to 40 hours (*n* = 1; 0.49%), 41 to 45 hours (*n* = 0; 0.00%), 46 to 50 hours (*n* = 0; 0.00), 51 to 55 hours (*n* = 0; 0.00%), and 56 to 60 hours (*n* = 1; 0.49%) supervising student agricultural mechanics SAE projects. Finally, five (2.46%) respondents did not respond to this item.

Table 12

Hours Spent Supervising Student Agricultural Mechanics SAE Projects (*n* = 203)

Hours	*f*	%
0 to 5	147	72.41
6 to 10	38	18.72
11 to 15	4	1.97
16 to 20	4	1.97
21 to 25	3	1.47
26 to 30	0	0.00
31 to 35	0	0.00
36 to 40	1	0.49
41 to 45	0	0.00
46 to 50	0	0.00
51 to 55	0	0.00
56 to 60	1	0.49
No Response	5	2.46

Respondents also indicated the number of university semester credit hours they completed in agricultural mechanics coursework while completing their undergraduate degree. The largest number of respondents (*n* = 70; 34.48%) indicated they earned 0 to 5 semester credit hours of agricultural mechanics coursework while completing their undergraduate degree. The next largest group was teachers who reported 6 to 10 semester credit hours (*n* = 62; 30.54%), followed by those who reported 11 to 15 semester credit hours (*n* = 35; 17.24%), 16 to 20 semester credit hours (*n* = 10; 4.93%), 21 to 25 semester credit hours (*n* = 7; 3.45%), and 26 to 30 semester credit hours (*n* = 7; 3.45%). Furthermore, the other teachers indicated having earned 31 to 35 semester credit hours (*n* = 2; 0.99%), 36 to 40 semester credit hours (*n* = 4; 1.97%), 41 to 45 semester credit hours (*n* = 2; 0.99%). Only three teachers reported that they earned over 46 semester credit hours (*n* = 3; 1.47%) in agricultural mechanics coursework. One subject did not respond to this item. A summary of these data are displayed in Table 13.

Table 13

University Semester Credit Hours of Agricultural Mechanics Coursework Earned by Missouri School-Based Agriculture Teachers Who Instruct Agricultural Construction 1 and/or Agricultural Construction 2 (n = 203)

University Semester Credit Hours Earned	*f*	%
0 - 5	70	34.48
6 - 10	62	30.54
11 - 15	35	17.24
16 - 20	10	4.93
21 - 25	7	3.45
26 - 30	7	3.45
31 - 35	2	0.99
36 - 40	4	1.97
41 - 45	2	0.99
46 - 50	0	0.00
51 - 55	0	0.00
56 - 60	1	0.49
61 - 65	1	0.49
66 - 70	0	0.00
71 - 75	1	0.49
No Response	1	0.49

In Table 14, respondents identified the number of years that they had taught school-based agricultural education. The highest percentage of respondents (n = 55;

27.09%) indicated that they had 0 to 5 years of teaching experience. The next largest category was respondents with 6 to 10 years of teaching experience (*n* = 43; 21.18.00%), followed by 11 to 15 years of teaching experience (*n* = 32; 15.76%), and 16 to 20 years of teaching experience (*n* = 31; 15.27%). Nineteen teachers indicated that they had 21 to 25 years of teaching experience (9.36%) followed by teachers with 26 to 30 years of teaching experience (*n* = 19; 9.36%), 31 to 35 years of teaching experience (*n* = 2; 0.99%), 36 to 40 years of teaching experience (*n* = 1; 0.49%), and 41 to 45 years of teaching experience (*n* = 1; 0.49%).

Table 14

Teaching Experience of Missouri School-Based Agriculture Teachers Who Instruct Agricultural Construction 1 and/or Agricultural Construction 2 (*n* = 203)

Years of Teaching Experience	*f*	%
1 – 5	55	27.09
6 – 10	43	21.18
11 – 15	32	15.76
16 – 20	31	15.27
21 – 25	19	9.36
26 – 30	19	9.36
31 – 35	2	0.99
36 – 40	1	0.49
41 – 45	1	0.49

Respondents identified the agricultural education district in which they teach school-based agricultural education (see Table 15). The largest number of respondents (*n* = 47; 23.15%) indicated they teach in the Northeast District. The next largest group was teachers who taught in the Central District (*n* = 42; 20.69%), followed by the Southwest District (*n* = 41; 20.20%), the Northwest District (*n* = 27; 13.30%), the South Central District (*n* = 26; 12.81%), and finally the Southeast District (*n* = 20; 9.85%).

Table 15

FFA District Location of Missouri School-Based Agriculture Teachers Who Instruct Agricultural Construction 1 and/or Agricultural Construction 2 (*n* = 203)

Agricultural Education District	*f*	%
Northeast	47	23.15
Central	42	20.69
Southwest	41	20.20
Northwest	27	13.30
South Central	26	12.81
Southeast	20	9.85

Research Question Two – Curriculum Components of Agricultural Construction 1 and/or Agricultural Construction 2 Taught By Missouri School-Based Agriculture Teachers

The second research question sought to describe the curriculum areas were taught by Missouri school-based agriculture teachers who teach Agricultural Construction 1 and/or Agricultural Construction 2. These areas included: Arc Welding, Project Construction, Oxy-Gas and Other Cutting/Welding, Woodworking, Metals, and Finishing. As shown in Table 16, Missouri school-based agriculture teachers who instruct Agricultural Construction 1 and/or Agricultural Construction 2 (*n* = 203), indicated the curriculum areas that they teach within this course. The majority of respondents (*n* = 172; 84.70%) reported they teach Arc Welding curriculum. Nearly 9 of every 10 teachers (*n* = 180; 88.70%) also indicated they teach Project Construction curriculum. Oxy-gas and Other Cutting/Welding Processes was the third curriculum area. Respondents (*n* = 171; 84.20%) indicated that they teach this curriculum in the course Agricultural Construction 1 and/or Agricultural Construction 2.

Almost two-thirds of respondents (*n* = 124; 61.10%) indicated that they taught the curriculum area, Woodworking. Metals curriculum was reported as being taught by two thirds of the respondents (*n* = 140; 69.00%). Finally, 143 (70.40%) teachers indicated to the researcher that they teach Finishing curriculum. A summary of these data are displayed in Table 16.

Table 16

Curriculum Areas Taught by Missouri School-Based Agriculture Teachers Who Instruct Agricultural Construction 1 and/or Agricultural Construction 2 (*n* = 203)

Curriculum Areas	Yes		No	
	f	%	*f*	%
Arc Welding	172	84.70	31	15.30
Project Construction	180	88.70	23	11.30
Oxy-Gas and Other Cutting/ Welding Processes	171	84.20	32	15.80
Woodworking	124	61.10	79	38.90
Metals	140	69.00	63	31.00
Finishing	143	70.40	60	29.60

Research Question Three – Factors That Influence Curriculum Instruction

Research question three sought to determine factors influencing Missouri school-based agriculture teachers to instruct various curriculum areas in Agricultural Construction 1 and/or Agricultural Construction 2. Through a review of literature and the use of a panel of experts, the following influential factors were developed for use in this study: Personal Importance, Personal Ability to Teach, Personal Interest in Teaching, Experience in Teaching, Equipment Available to Teach, Facilities Available to Teach, Budget Available to Teach, Student Importance, Community Importance, and Administrative Importance. The curriculum areas included: Arc Welding, Project Construction, Oxy-Gas and Other Cutting/Welding Processes, Woodworking, Metals, and Finishing. Because some of the characteristics were nominal and others were ordinal in nature, these characteristics are reported using frequency and percentages. For other characteristics, measures of central tendency and variability were reported.

As reported in Table 30 (Appendix M), subjects were asked to rate the level of influence of factors that influence their decision to teach Arc Welding curriculum in this course. The rating scale for this item was: 0 = no influence, 1 = little influence, 2 = some influence, 3 = moderate influence, 4 = great influence. The mean for the factor *Personal Importance* was 3.50 (Median = 4.00; Mode = 4.00; Variance = 0.39; *SD* = 0.63; Range = 3.00). The mean for factor *Personal Ability to Teach* was 3.24 (Median = 3.00; Mode = 4.00; Variance = 0.81; *SD* = 0.90; Range = 4.00) followed by the factor *Personal Interest in Teaching* had a mean of 3.23 (Median = 3.00; Mode = 4.00; Variance = 0.90; *SD* = 0.95; Range = 4.00). *Experience in Teaching* had a mean of 3.15 (Median = 3.00; Mode = 4.00; Variance = 0.81; *SD* = 0.90; Range = 4.00); which followed by *Equipment Available to Teach*, with a mean of 3.13 (Median = 3.00; Mode = 4.00; Variance = 0.85; *SD* = 0.92; Range = 3.00); *Student Importance*, with a mean of 3.11 (Median = 3.00; Mode = 4.00; Variance = 0.87; *SD* = 0.93; Range = 4.00); *Facilities Available to Teach*, with a mean of 3.02 (Median = 3.00; Mode = 4.00; Variance = 0.91; *SD* = 0.95; Range = 3.00); and *Community Importance*, with a mean of 2.84 (Median = 3.00; Mode = 3.00; Variance = 0.75; *SD* = 0.87; Range = 3.00). The influential factor *Budget Available to Teach*, had a mean of 2.78 (Median = 3.00; Mode = 4.00; Variance = 1.05; *SD* = 1.02; Range = 4.00). *Administration Importance*, had a mean of 2.41 (Median = 2.50; Mode = 3.00; Variance = 1.20; *SD* = 1.10; Range = 4.00).

Missouri school-based agricultural educators (*n* = 172), who instruct the agricultural education course Agricultural Construction 1 and/or Agricultural Construction 2, were asked to rate the level of influence (0 = no influence, 1 = little influence, 2 = some influence, 3 = moderate influence, 4 = great influence) of factors that might influence their decision to teach Arc Welding curriculum in this course. Regarding the influential factor *Personal Importance*, respondents identified with the following levels of influence: No Influence (*n* = 0; 0.00%), Little Influence (*n* = 1; 0.50%), Some Influence (*n* = 9; 4.40%); Moderate Influence (*n* = 65; 32.00%); and Great Influence (*n* = 97; 47.80%). For the influential factor *Community Importance*, respondents identified with the following levels of influence: No Influence (*n* = 0; 0.00%), Little Influence (*n* = 10; 4.90%), Some Influence (*n* = 50; 24.60%); Moderate Influence (*n* = 69; 34.00%); and Great Influence (*n* = 43; 21.20%). Subsequently, the following influential factors were also rated by the respondents regarding the levels of influence: *Student Importance*, No Influence (*n* = 2; 1.00%), Little Influence (*n* = 9; 4.40%), Some Influence (*n* = 27; 13.30%); Moderate Influence (*n* = 64; 31.50%); and Great Influence (*n* = 70; 34.50%); *Administration Importance*, No Influence (*n* = 8; 3.90%), Little Influence (*n* = 29; 14.30%), Some Influence (*n* = 49; 24.10%); Moderate Influence (*n* = 57; 28.10%); and Great Influence (*n* = 29; 14.30%); *Personal Ability to Teach*, No Influence (*n* = 2; 1.00%), Little Influence (*n* = 7; 3.40%), Some Influence (*n* = 21; 10.30%); Moderate Influence (*n* = 60; 29.60%); and Great Influence (*n* = 82; 40.40%); *Personal Interest in Teaching*, No Influence (*n* = 2; 1.00%), Little Influence (*n* = 10; 4.90%), Some Influence (*n* = 20; 9.90%); Moderate Influence (*n* = 55; 27.10%); and Great Influence (*n* = 85; 41.90%); *Experience in Teaching*, No Influence (*n* = 1; 0.50%), Little Influence (*n* = 9;

4.40%), Some Influence (*n* = 25; 12.30%); Moderate Influence (*n* = 65; 32.00%); and Great Influence (*n* = 72; 35.50%). Finally, the following influential factors were also rated by the respondents regarding the levels of influence: *Facilities Available to Teach*, No Influence (*n* = 0; 0.00%), Little Influence (*n* = 15; 7.40%), Some Influence (*n* = 31; 15.30%); Moderate Influence (*n* = 61; 30.00%); and Great Influence (*n* = 65; 32.00%); *Equipment Available to Teach*, No Influence (*n* = 0; 0.00%), Little Influence (*n* = 13; 6.40%), Some Influence (*n* = 24; 11.80%); Moderate Influence (*n* = 63; 31.00%); and Great Influence (*n* = 72; 35.50%); *Budget Available to Teach*, No Influence (*n* = 1; 0.50%), Little Influence (*n* = 19; 9.40%), Some Influence (*n* = 49; 24.10%); Moderate Influence (*n* = 50; 24.60%); and Great Influence (*n* = 53; 26.10%). A summary of these data are displayed in Table 17.

Table 17

Factors Influencing Missouri School-Based Agriculture Teachers to Instruct Arc Welding Curriculum (n = 172)

Factor	Levels of Influence 0		1		2		3		4			
	f	%	*f*	%	*f*	%	*f*	%	*f*	%	*M*	*SD*
Personal Importance	0	0.00	1	0.50	9	4.40	65	32.00	97	47.80	3.50	0.63
Personal Ability to Teach	2	1.00	7	3.40	21	10.30	60	29.60	82	40.40	3.24	0.90
Personal Interest in Teaching	2	1.00	10	4.90	20	9.90	55	27.10	85	41.90	3.23	0.95
Experience in Teaching	1	0.50	9	4.40	25	12.30	65	32.00	72	35.50	3.15	0.90
Equipment Available to Teach	0	0.00	13	6.40	24	11.80	63	31.10	72	35.50	3.13	0.92
Student Importance	2	1.00	9	4.40	27	13.30	64	31.50	70	34.50	3.11	0.93
Facilities Available to Teach	0	0.00	15	7.40	31	15.30	61	30.00	65	32.00	3.02	0.95
Community Importance	0	0.00	10	4.90	50	24.60	69	34.00	43	21.20	2.84	0.87
Budget Available to Teach	1	0.50	19	9.40	49	24.10	50	24.60	53	26.10	2.78	1.02
Administration Importance	8	3.90	29	14.30	49	24.10	57	28.10	29	14.30	2.41	1.10

Note. Levels of Influence: 0 to .50 = No Influence, .51 to 1.50 = Little Influence, 1.51 to 2.50 = Some Influence, 2.51 to 3.50 = Moderate Influence, 3.51 to 4.00 = Great Influence.

In this study, Missouri school-based agricultural educators (*n* = 181), who instruct the agricultural education course Agricultural Construction 1 and/or Agricultural Construction 2, the respondents were asked to rate the level of influence (0 = no influence, 1 = little influence, 2 = some influence, 3 = moderate influence, 4 = great influence) of factors that might influence their decision to teach Project Construction curriculum in this course. Regarding the influential factor *Personal Importance*, the mean was 3.40 (Median = 4.00; Mode = 4.00; Variance = 0.53; *SD* = 0.73; Range = 4.00). In terms of the influential factor *Personal Interest in Teaching*, with a mean of 3.22 (Median = 3.00; Mode = 4.00; Variance = 0.83; *SD* = 0.91; Range = 4.00). This was followed by *Experience in Teaching*, with a mean of 3.15 (Median = 3.00; Mode = 4.00; Variance = 0.77; *SD* = 0.88; Range = 4.00); *Equipment Available to Teach*, with a mean of 3.15 (Median = 3.00; Mode = 4.00; Variance = 0.79; *SD* = 0.89; Range = 4.00); *Personal Ability to Teach*, with a mean of 3.12 (Median = 3.00; Mode = 3.00; Variance = 0.76; *SD* = 0.87; Range = 4.00); *Facilities Available to Teach*, with a mean of 3.11 (Median = 3.00; Mode = 4.00; Variance = 0.89; *SD* = 0.94; Range = 4.00); *Student Importance*, with a mean of 3.06 (Median = 3.00; Mode = 3.00; Variance = 0.88; *SD* = 0.77; Range = 4.00); *Community Importance*, with a mean of 2.96 (Median = 3.00; Mode = 3.00; Variance = 0.96; *SD* = 0.98; Range = 4.00); and *Budget Available to Teach*, with a mean of 2.89 (Median = 3.00; Mode = 4.00; Variance = 1.03; *SD* = 1.02; Range = 4.00). Finally, the influential factor *Administration Importance*, had a mean of 2.57 (Median = 3.00; Mode = 3.00; Variance = 1.19; *SD* = 1.09; Range = 4.00). A summary of these data are displayed in Table 31 (Appendix N).

In Table 18, Missouri school-based agricultural educators (*n* = 181), who instruct the agricultural education course Agricultural Construction 1 and/or Agricultural Construction 2, were asked to rate the level of influence (0 = no influence, 1 = little influence, 2 = some influence, 3 = moderate influence, 4 = great influence) of factors that might influence their decision to teach Project Construction curriculum in this course. Regarding the influential factor *Personal Importance*, respondents identified with the following levels of influence: No Influence (*n* = 1; 0.50%), Little Influence (*n* = 0; 0.00%), Some Influence (*n* = 20; 9.90%); Moderate Influence (*n* = 64; 31.50%); and Great Influence (*n* = 96; 47.30%). For the influential factor *Community Importance*, respondents identified with the following levels of influence: No Influence (*n* = 3; 1.50%), Little Influence (*n* = 12; 5.90%), Some Influence (*n* = 36; 17.70%); Moderate Influence (*n* = 68; 33.50%); and Great Influence (*n* = 62; 30.50%). Subsequently, the following influential factors were also rated by the respondents regarding the levels of influence: *Student Importance*, No Influence (*n* = 1; 0.50%), Little Influence (*n* = 8; 3.90%), Some Influence (*n* = 34; 16.70%); Moderate Influence (*n* = 74; 36.50%); and Great Influence (*n* = 64; 31.50%); *Administration Importance*, No Influence (*n* = 5; 2.50%), Little Influence (*n* = 27; 13.30%), Some Influence (*n* = 52; 25.60%); Moderate Influence (*n* = 54; 26.60%); and Great Influence (*n* = 43; 21.20%); *Personal Ability to Teach*, No Influence (*n* = 2; 1.00%), Little Influence (*n* = 5; 2.50%), Some Influence (*n* = 31; 15.30%); Moderate Influence (*n* = 73; 36.00%); and Great Influence (*n* = 70; 34.50%); *Personal Interest in Teaching*, No Influence (*n* = 3; 1.50%), Little Influence (*n* = 4; 2.00%), Some Influence (*n* = 29; 14.30%); Moderate Influence (*n* = 60; 29.60%); and Great Influence (*n* = 85; 41.90%); *Experience in Teaching*, No Influence (*n* = 2;

1.00%), Little Influence (*n* = 6; 3.00%), Some Influence (*n* = 28; 13.80%); Moderate Influence (*n* = 72; 35.50%); and Great Influence (*n* = 73; 36.00%). Finally, the following influential factors were also rated by the respondents regarding the levels of influence: *Facilities Available to Teach*, No Influence (*n* = 1; 0.50%), Little Influence (*n* = 10; 4.90%), Some Influence (*n* = 35; 17.20%); Moderate Influence (*n* = 57; 28.10%); and Great Influence (*n* = 78; 38.40%); *Equipment Available to Teach*, No Influence (*n* = 1; 0.50%), Little Influence (*n* = 7; 3.40%), Some Influence (*n* = 33; 16.30%); Moderate Influence (*n* = 63; 31.00%); and Great Influence (*n* = 77; 37.90%); *Budget Available to Teach*, No Influence (*n* = 4; 2.00%), Little Influence (*n* = 11; 5.40%), Some Influence (*n* = 47; 23.20%); Moderate Influence (*n* = 58; 28.60%); and Great Influence (*n* = 61; 30.00%).

Table 18

Factors Influencing Missouri School-Based Agriculture Teachers to Instruct Project Construction Curriculum (n = 181)

Factor	Levels of Influence: 0		1		2		3		4			
	f	%	*f*	%	*f*	%	*f*	%	*f*	%	*M*	*SD*
Personal Importance	1	0.50	0	0.00	20	9.90	64	31.50	96	47.30	3.40	0.73
Personal Interest in Teaching	3	1.50	4	2.00	29	14.30	60	29.60	85	41.90	3.22	0.91
Experience in Teaching	2	1.00	6	3.00	28	13.80	72	35.50	73	36.00	3.15	0.88
Equipment Available to Teach	1	0.50	7	3.40	33	16.30	63	31.00	77	37.90	3.15	0.89
Personal Ability to Teach	2	1.00	5	2.50	31	15.30	73	36.00	70	34.50	3.12	0.87
Facilities Available to Teach	1	0.50	10	4.90	35	17.20	57	28.10	78	38.40	3.11	0.94
Student Importance	1	0.50	8	3.90	34	16.70	74	36.50	64	31.50	3.06	0.77
Community Importance	3	1.50	12	5.90	36	17.70	68	33.50	62	30.50	2.96	0.98
Budget Available to Teach	4	2.00	11	5.40	47	23.20	58	28.60	61	30.00	2.89	1.02
Administration Importance	5	2.50	27	13.30	52	25.60	54	26.60	43	21.20	2.57	1.09

Note. Levels of Influence: 0 to .50 = No Influence, .51 to 1.50 = Little Influence, 1.51 to 2.50 = Some Influence, 2.51 to 3.50 = Moderate Influence, 3.51 to 4.00 = Great Influence.

In a study of Missouri school-based agricultural educators (*n* = 171), who instruct the agricultural education course Agricultural Construction 1 and/or Agricultural Construction 2, the respondents were asked to rate the level of influence (0 = no influence, 1 = little influence, 2 = some influence, 3 = moderate influence, 4 = great influence) of factors that might influence their decision to teach Oxy-Gas And Other Cutting/Welding Processes curriculum in this course. Regarding the influential factor *Personal Importance*, the mean was 3.16 (Median = 3.00; Mode = 3.00; Variance = 0.65; *SD* = 0.81; Range = 4.00). In terms of the influential factor *Experience in Teaching*, with a mean of 2.97 (Median = 3.00; Mode = 3.00; Variance = 0.78; *SD* = 0.88; Range = 4.00). This was followed by *Personal Ability to Teach*, with a mean of 2.96 (Median = 3.00; Mode = 3.00; Variance = 0.97; *SD* = 0.99; Range = 4.00); *Equipment Available to Teach*, with a mean of 2.94 (Median = 3.00; Mode = 3.00; Variance = 0.91; *SD* = 0.95; Range = 4.00); *Personal Interest in Teaching*, with a mean of 2.93 (Median = 3.00; Mode = 3.00; Variance = 0.97; *SD* = 0.99; Range = 4.00); *Facilities Available to Teach*, with a mean of 2.88 (Median = 3.00; Mode = 3.00; Variance = 0.94; *SD* = 0.97; Range = 4.00); *Budget Available to Teach*, with a mean of 2.75 (Median = 3.00; Mode = 2.00; Variance = 1.01; *SD* = 1.00; Range = 4.00); *Student Importance*, with a mean of 2.71 (Median = 3.00; Mode = 3.00; Variance = 0.90; *SD* = 0.95; Range = 4.00); and *Community Importance*, with a mean of 2.54 (Median = 3.00; Mode = 3.00; Variance = 1.00; *SD* = 1.00; Range = 4.00). Finally, the influential factor *Administration Importance*, had a mean of 2.24 (Median = 2.00; Mode = 2.00; Variance = 1.08; *SD* = 1.04; Range = 4.00). A summary of these data are displayed in Table 32 (Appendix O).

In Table 19, Missouri school-based agricultural educators (*n* = 171), who instruct the agricultural education course Agricultural Construction 1 and/or Agricultural Construction 2, were asked to rate the level of influence (0 = no influence, 1 = little influence, 2 = some influence, 3 = moderate influence, 4 = great influence) of factors that might influence their decision to teach Oxy-Gas And Other Cutting/Welding Processes curriculum in this course. Regarding the influential factor *Personal Importance*, respondents identified with the following levels of influence: No Influence (*n* = 1; 0.50%), Little Influence (*n* = 2; 1.00%), Some Influence (*n* = 32; 15.80%); Moderate Influence (*n* = 70; 34.50%); and Great Influence (*n* = 66; 32.50%). For the influential factor *Community Importance*, respondents identified with the following levels of influence: No Influence (*n* = 1; 0.50%), Little Influence (*n* = 28; 13.80%), Some Influence (*n* = 53; 26.10%); Moderate Influence (*n* = 56; 27.60%); and Great Influence (*n* = 33; 16.30%). Subsequently, the following influential factors were also rated by the respondents regarding the levels of influence: *Student Importance*, No Influence (*n* = 1; 0.50%), Little Influence (*n* = 17; 8.40%), Some Influence (*n* = 51; 25.10%); Moderate Influence (*n* = 63; 31.00%); and Great Influence (*n* = 39; 19.20%); *Administration Importance*, No Influence (*n* = 8; 3.90%), Little Influence (*n* = 34; 16.70%), Some Influence (*n* = 56; 27.60%); Moderate Influence (*n* = 55; 27.10%); and Great Influence (*n* = 18; 8.90%); *Personal Ability to Teach,* No Influence (*n* = 4; 2.00%), Little Influence (*n* = 6; 3.00%), Some Influence (*n* = 38; 18.70%); Moderate Influence (*n* = 68; 33.50%); and Great Influence (*n* = 55; 27.10%); *Personal Interest in Teaching*, No Influence (*n* = 5; 2.50%), Little Influence (*n* = 7; 3.40%), Some Influence (*n* = 38; 18.70%); Moderate Influence (*n* = 66; 32.50%); and Great Influence (*n* = 55; 27.10%); *Experience in*

Teaching, No Influence (*n* = 2; 1.00%), Little Influence (*n* = 6; 3.00%), Some Influence (*n* = 39; 19.20%); Moderate Influence (*n* = 73; 36.00%); and Great Influence (*n* = 51; 25.10%). Finally, the following influential factors were also rated by the respondents regarding the levels of influence: *Facilities Available to Teach*, No Influence (*n* = 4; 2.00%), Little Influence (*n* = 7; 3.40%), Some Influence (*n* = 46; 22.70%); Moderate Influence (*n* = 62; 30.50%); and Great Influence (*n* = 52; 25.60%); *Equipment Available to Teach*, No Influence (*n* = 2; 1.00%), Little Influence (*n* = 10; 4.90%), Some Influence (*n* = 41; 20.20%); Moderate Influence (*n* = 62; 30.50%); and Great Influence (*n* = 56; 27.60%); and *Budget Available to Teach*, No Influence (*n* = 3; 1.50%), Little Influence (*n* = 12; 5.90%), Some Influence (*n* = 59; 29.10%); Moderate Influence (*n* = 48; 23.60%); and Great Influence (*n* = 49; 24.10%).

Table 19

Factors Influencing Missouri School-Based Agriculture Teachers to Instruct Oxy-Gas Cutting/Welding Curriculum (n = 171)

Factor	Levels of Influence											
	0		1		2		3		4			
	f	%	*f*	%	*f*	%	*f*	%	*f*	%	*M*	*SD*
Personal Importance	1	0.50	2	1.00	32	15.80	70	34.50	66	32.50	3.61	0.81
Experience in Teaching	2	1.00	6	3.00	39	19.20	73	36.00	51	25.10	2.97	0.88
Personal Ability to Teach	4	2.00	6	3.00	38	18.70	68	33.50	55	27.10	2.96	0.99
Equipment Available to Teach	2	1.00	10	4.90	41	20.20	62	30.50	56	27.60	2.94	0.95
Personal Interest in Teaching	5	2.50	7	3.40	38	18.70	66	32.50	55	27.10	2.93	0.99
Facilities Available to Teach	4	2.00	7	3.40	46	22.70	62	30.50	52	25.60	2.88	0.97
Budget Available to Teach	3	1.50	12	5.90	59	29.10	48	23.60	49	24.10	2.75	1.00
Student Importance	1	0.50	17	8.40	51	25.10	63	31.00	39	19.20	2.71	0.95
Community Importance	1	0.50	28	13.80	53	26.10	56	27.60	33	16.30	2.54	1.00
Administration Importance	8	3.90	34	16.70	56	27.60	55	27.10	18	8.90	2.24	1.04

Note. Levels of Influence: 0 to .50 = No Influence, .51 to 1.50 = Little Influence, 1.51 to 2.50 = Some Influence, 2.51 to 3.50 = Moderate Influence, 3.51 to 4.00 = Great Influence.

In this study, Missouri school-based agricultural educators (*n* = 124), who instruct the agricultural education course Agricultural Construction 1 and/or Agricultural Construction 2, the respondents were asked to rate the level of influence (0 = no influence, 1 = little influence, 2 = some influence, 3 = moderate influence, 4 = great influence) of factors that might influence their decision to teach Woodworking curriculum in this course. Regarding the influential factor *Personal Importance*, the mean was 2.98 (Median = 3.00; Mode = 4.00; Variance = 0.76; *SD* = 0.87; Range = 3.00). In terms of the influential factor *Personal Ability to Teach*, with a mean of 2.83 (Median = 3.00; Mode = 4.00; Variance = 1.02; *SD* = 1.01; Range = 4.00). This was followed by *Equipment Available to Teach*, with a mean of 2.82 (Median = 3.00; Mode = 2.00; Variance = 0.83; *SD* = 0.91; Range = 3.00); *Facilities Available to Teach*, with a mean of 2.76 (Median = 3.00; Mode = 2.00; Variance = 0.93; *SD* = 0.97; Range = 4.00); *Personal Interest in Teaching*, with a mean of 2.75 (Median = 3.00; Mode = 2.00; Variance = 1.12; *SD* = 1.06; Range = 4.00); *Experience in Teaching*, with a mean of 2.73 (Median = 3.00; Mode = 3.00; Variance = 0.98; *SD* = 0.99; Range = 4.00); *Student Importance*, with a mean of 2.63 (Median = 3.00; Mode = 2.00; Variance = 0.85; *SD* = 0.92; Range = 4.00); *Budget Available to Teach*, with a mean of 2.56 (Median = 2.00; Mode = 2.00; Variance = 0.92; *SD* = 0.96; Range = 3.00); and *Community Importance*, with a mean of 2.42 (Median = 2.00; Mode = 2.00; Variance = 0.93; *SD* = 0.96; Range = 4.00). Finally, the influential factor *Administration Importance*, had a mean of 2.26 (Median = 2.00; Mode = 2.00; Variance = 0.89; *SD* = 0.95; Range = 4.00). A summary of these data are displayed in Table 33 (Appendix P).

In Table 20, Missouri school-based agricultural educators (*n* = 124), who instruct the agricultural education course Agricultural Construction 1 and/or Agricultural Construction 2, were asked to rate the level of influence (0 = no influence, 1 = little influence, 2 = some influence, 3 = moderate influence, 4 = great influence) of factors that might influence their decision to teach Woodworking curriculum in this course. Regarding the influential factor *Personal Importance*, respondents identified with the following levels of influence: No Influence (*n* = 0; 0.00%), Little Influence (*n* = 2; 1.00%), Some Influence (*n* = 42; 20.70%); Moderate Influence (*n* = 36; 17.70%); and Great Influence (*n* = 44; 21.70%). For the influential factor *Community Importance*, respondents identified with the following levels of influence: No Influence (*n* = 3; 1.50%), Little Influence (*n* = 17; 8.40%), Some Influence (*n* = 45; 22.20%); Moderate Influence (*n* = 43; 21.20%); and Great Influence (*n* = 16; 7.90%). Subsequently, the following influential factors were also rated by the respondents regarding the levels of influence: *Student Importance*, No Influence (*n* = 0; 0.00%), Little Influence (*n* = 13; 6.40%), Some Influence (*n* = 45; 22.20%); Moderate Influence (*n* = 41; 20.20%); and Great Influence (*n* = 25; 12.30%); *Administration Importance*, No Influence (*n* = 4; 2.00%), Little Influence (*n* = 18; 8.90%), Some Influence (*n* = 57; 28.10%); Moderate Influence (*n* = 32; 15.80%); and Great Influence (*n* = 13; 6.40%); *Personal Ability to Teach*, No Influence (*n* = 2; 1.00%), Little Influence (*n* = 9; 4.40%), Some Influence (*n* = 36; 17.70%); Moderate Influence (*n* = 38; 18.70%); and Great Influence (*n* = 39; 19.20%); *Personal Interest in Teaching*, No Influence (*n* = 3; 1.50%), Little Influence (*n* = 11; 5.40%), Some Influence (*n* = 37; 18.20%); Moderate Influence (*n* = 36; 17.70%); and Great Influence (*n* = 37; 18.20%); *Experience in Teaching*, No Influence (*n* = 3;

1.50%), Little Influence (*n* = 8; 3.90%), Some Influence (*n* = 40; 19.70%); Moderate Influence (*n* = 42; 20.70%); and Great Influence (*n* = 31; 15.30%). Finally, the following influential factors were also rated by the respondents regarding the levels of influence: *Facilities Available to Teach*, No Influence (*n* = 1; 0.50%), Little Influence (*n* = 7; 3.40%), Some Influence (*n* = 49; 24.10%); Moderate Influence (*n* = 31; 15.30%); and Great Influence (*n* = 36; 17.70%); *Equipment Available to Teach*, No Influence (*n* = 0; 0.00%), Little Influence (*n* = 6; 3.00%), Some Influence (*n* = 46; 22.70%); Moderate Influence (*n* = 36; 17.70%); and Great Influence (*n* = 36; 17.70%); and *Budget Available to Teach*, No Influence (*n* = 0; 0.00%), Little Influence (*n* = 14; 6.90%), Some Influence (*n* = 53; 26.10%); Moderate Influence (*n* = 30; 14.80%); and Great Influence (*n* = 27; 13.30%).

Table 20

Factors Influencing Missouri School-Based Agriculture Teachers to Instruct Woodworking Curriculum (*n* = 124)

Factor	Levels of Influence											
	0		1		2		3		4			
	f	%	*f*	%	*f*	%	*f*	%	*f*	%	*M*	*SD*
Personal Importance	0	0.00	2	1.00	42	20.70	36	17.70	44	21.70	2.98	0.87
Personal Ability to Teach	2	1.00	9	4.40	36	17.70	38	18.70	39	19.20	2.83	1.01
Equipment Available to Teach	0	0.00	6	3.00	46	22.70	36	17.70	36	17.70	2.82	0.91
Facilities Available to Teach	1	0.50	7	3.40	49	24.10	31	15.30	36	17.70	2.76	0.97
Personal Interest in Teaching	3	1.50	11	5.40	37	18.20	36	17.70	37	18.20	2.75	1.06
Experience in Teaching	3	1.50	8	3.90	40	19.70	42	20.70	31	15.30	2.73	0.99
Student Importance	0	0.00	13	6.40	45	22.20	41	20.20	25	12.30	2.63	0.92
Budget Available to Teach	0	0.00	14	6.90	53	26.10	30	14.80	27	13.30	2.56	0.96
Community Importance	3	1.50	17	8.40	45	22.20	43	21.20	16	7.90	2.42	0.96
Administration Importance	4	2.00	18	8.90	57	28.10	32	15.80	13	6.40	2.26	0.95

Note. Levels of Influence: 0 to .50 = No Influence, .51 to 1.50 = Little Influence, 1.51 to 2.50 = Some Influence, 2.51 to 3.50 = Moderate Influence, 3.51 to 4.00 = Great Influence.

In a study of Missouri school-based agricultural educators (*n* = 140), who instruct the agricultural education course Agricultural Construction 1 and/or Agricultural Construction 2, the respondents were asked to rate the level of influence (0 = no influence, 1 = little influence, 2 = some influence, 3 = moderate influence, 4 = great influence) of factors that might influence their decision to teach Metals curriculum in this course. Regarding the influential factor *Personal Importance*, the mean was 2.72 (Median = 3.00; Mode = 2.00; Variance = 0.82; *SD* = 0.91; Range = 4.00). In terms of the influential factor *Personal Interest in Teaching*, with a mean of 2.56 (Median = 3.00; Mode = 3.00; Variance = 1.13; *SD* = 1.06; Range = 4.00). This was followed by *Equipment Available to Teach*, with a mean of 2.54 (Median = 3.00; Mode = 2.00; Variance = 1.14; *SD* = 1.07; Range = 4.00); *Facilities Available to Teach*, with a mean of 2.53 (Median = 2.50; Mode = 2.00; Variance = 1.13; *SD* = 1.06; Range = 4.00); *Experience in Teaching*, with a mean of 2.50 (Median = 3.00; Mode = 3.00; Variance = 0.96; *SD* = 0.98; Range = 4.00); *Personal Ability to Teach*, with a mean of 2.47 (Median = 2.00; Mode = 2.00; Variance = 1.04; *SD* = 1.02; Range = 4.00); *Budget Available to Teach*, with a mean of 2.40 (Median = 2.00; Mode = 2.00; Variance = 1.25; *SD* = 1.12; Range = 4.00); *Student Importance*, with a mean of 2.24 (Median = 2.00; Mode = 2.00; Variance = 0.99; *SD* = 1.00; Range = 4.00); and *Community Importance*, with a mean of 2.15 (Median = 2.00; Mode = 2.00; Variance = 1.00; *SD* = 1.00; Range = 4.00). Finally, the influential factor *Administration Importance*, had a mean of 1.95 (Median = 2.00; Mode = 2.00; Variance = 1.13; *SD* = 1.06; Range = 4.00). A summary of these data are displayed in Table 34 (Appendix Q).

In Table 21, Missouri school-based agricultural educators (*n* = 140), who instruct the agricultural education course Agricultural Construction 1 and/or Agricultural Construction 2, were asked to rate the level of influence (0 = no influence, 1 = little influence, 2 = some influence, 3 = moderate influence, 4 = great influence) of factors that might influence their decision to teach Metals curriculum in this course. Regarding the influential factor *Personal Importance*, respondents identified with the following levels of influence: No Influence (*n* = 1; 0.50%), Little Influence (*n* = 8; 3.90%), Some Influence (*n* = 52; 25.60%); Moderate Influence (*n* = 47; 23.20%); and Great Influence (*n* = 32; 15.80%). For the influential factor *Community Importance*, respondents identified with the following levels of influence: No Influence (*n* = 7; 3.40%), Little Influence (*n* = 27; 13.30%), Some Influence (*n* = 57; 28.10%); Moderate Influence (*n* = 36; 17.70%); and Great Influence (*n* = 13; 6.40%). Subsequently, the following influential factors were also rated by the respondents regarding the levels of influence: *Student Importance*, No Influence (*n* = 6; 3.00%), Little Influence (*n* = 22; 10.80%), Some Influence (*n* = 60; 29.60%); Moderate Influence (*n* = 36; 17.70%); and Great Influence (*n* = 16; 7.90%); *Administration Importance*, No Influence (*n* = 13; 6.40%), Little Influence (*n* = 32; 15.80%), Some Influence (*n* = 55; 27.10%); Moderate Influence (*n* = 29; 14.30%); and Great Influence (*n* = 11; 5.40%); *Personal Ability to Teach*, No Influence (*n* = 5; 2.50%), Little Influence (*n* = 16; 7.90%), Some Influence (*n* = 51; 25.10%); Moderate Influence (*n* = 44; 21.70%); and Great Influence (*n* = 24; 11.80%); *Personal Interest in Teaching*, No Influence (*n* = 4; 2.00%), Little Influence (*n* = 20; 9.90%), Some Influence (*n* = 38; 18.70%); Moderate Influence (*n* = 49; 24.10%); and Great Influence (*n* = 29; 14.30%); *Experience in Teaching*, No Influence (*n* = 3; 1.50%), Little Influence (*n* = 19; 9.40%), Some Influence (*n* = 44; 21.70%); Moderate Influence (*n* = 53; 26.10%); and Great Influence (*n* = 21; 10.30%). Finally, the following influential factors were also rated by the respondents regarding the levels of influence: *Facilities Available to Teach*, No Influence (*n* = 5; 2.50%), Little Influence (*n* = 16; 7.90%), Some Influence (*n* = 49; 24.10%); Moderate Influence (*n* = 40; 19.70%); and Great Influence (*n* = 30; 14.80%); *Equipment Available to Teach*, No Influence (*n* = 5; 2.50%), Little Influence (*n* = 16; 7.90%), Some Influence (*n* = 48; 23.60%); Moderate Influence (*n* = 40; 19.70%); and Great Influence (*n* = 31; 15.30%); and *Budget Available to Teach*, No Influence (*n* = 8; 3.90%), Little Influence (*n* = 19; 9.40%), Some Influence (*n* = 49; 24.10%); Moderate Influence (*n* = 37; 18.20%); and Great Influence (*n* = 27; 13.30%).

Table 21

Factors Influencing Missouri School-Based Agriculture Teachers to Instruct Metals Curriculum (n = 140)

Factor	Levels of Influence											
	0		1		2		3		4			
	f	%	*f*	%	*f*	%	*f*	%	*f*	%	*M*	*SD*
Personal Importance	1	0.50	8	3.90	52	25.60	47	23.20	32	15.80	2.72	0.91
Personal Interest in Teaching	4	2.00	20	9.90	38	18.70	49	24.10	29	14.30	2.56	1.06
Equipment Available to Teach	5	2.50	16	7.90	48	23.60	40	19.70	31	15.30	2.54	1.07
Facilities Available to Teach	5	2.50	16	7.90	49	24.10	40	19.70	30	14.80	2.53	1.06
Experience in Teaching	3	1.50	19	9.40	44	21.70	53	26.10	21	10.30	2.50	0.98
Personal Ability to Teach	5	2.50	16	7.90	51	25.10	44	21.70	24	11.80	2.47	1.02
Budget Available to Teach	8	3.90	19	9.40	49	24.10	37	18.20	27	13.30	2.40	1.12
Student Importance	6	3.00	22	10.80	60	29.60	36	17.70	16	7.90	2.24	1.00
Community Importance	7	3.40	27	13.30	57	28.10	36	17.70	13	6.40	2.15	1.00
Administration Importance	13	6.40	32	15.80	55	27.10	29	14.30	11	5.40	1.95	1.06

Note. Levels of Influence: 0 to .50 = No Influence, .51 to 1.50 = Little Influence, 1.51 to 2.50 = Some Influence, 2.51 to 3.50 = Moderate Influence, 3.51 to 4.00 = Great Influence.

In a study of Missouri school-based agricultural educators (*n* = 140), who instruct the agricultural education course Agricultural Construction 1 and/or Agricultural Construction 2, the respondents were asked to rate the level of influence (0 = no influence, 1 = little influence, 2 = some influence, 3 = moderate influence, 4 = great influence) of factors that might influence their decision to teach Finishing curriculum in this course. Regarding the influential factor *Personal Importance*, the mean was 2.86 (Median = 3.00; Mode = 3.00; Variance = 0.91; *SD* = 0.95; Range = 4.00). In terms of the influential factor *Personal Ability to Teach*, with a mean of 2.66 (Median = 3.00; Mode = 2.00; Variance = 0.92; *SD* = 0.96; Range = 4.00). This was followed by *Personal Interest in Teaching*, with a mean of 2.63 (Median = 3.00; Mode = 2.00; Variance = 0.99; *SD* = 0.99; Range = 4.00); *Experience in Teaching*, with a mean of 2.59 (Median = 3.00; Mode = 3.00; Variance = 0.98; *SD* = 0.99; Range = 4.00); *Facilities Available to Teach*, with a mean of 2.48 (Median = 3.00; Mode = 2.00; Variance = 1.25; *SD* = 1.12; Range = 4.00); *Equipment Available to Teach*, with a mean of 2.46 (Median = 3.00; Mode = 3.00; Variance = 1.26; *SD* = 1.12; Range = 4.00); *Student Importance*, with a mean of 2.42 (Median = 2.00; Mode = 2.00; Variance = 1.02; *SD* = 1.01; Range = 4.00); *Budget Available to Teach*, with a mean of 2.38 (Median = 2.00; Mode = 2.00; Variance = 1.35; *SD* = 1.16; Range = 4.00); and *Community Importance*, with a mean of 2.34 (Median = 2.00; Mode = 2.00; Variance = 1.11; *SD* = 1.06; Range = 4.00). Finally, the influential factor *Administration Importance*, had a mean of 2.12 (Median = 2.00; Mode = 2.00; Variance = 1.19; *SD* = 1.09; Range = 4.00). A summary of these data are displayed in Table 35 (Appendix R).

In Table 22, Missouri school-based agricultural educators (*n* = 140), who instruct the agricultural education course Agricultural Construction 1 and/or Agricultural Construction 2, were asked to rate the level of influence (0 = no influence, 1 = little influence, 2 = some influence, 3 = moderate influence, 4 = great influence) of factors that might influence their decision to teach Finishing curriculum in this course. Regarding the influential factor *Personal Importance*, respondents identified with the following levels of influence: No Influence (*n* = 2; 1.00%), Little Influence (*n* = 7; 3.40%), Some Influence (*n* = 42; 20.70%); Moderate Influence (*n* = 49; 24.10%); and Great Influence (*n* = 43; 21.20%).

For the influential factor *Community Importance*, respondents identified with the following levels of influence: No Influence (*n* = 8; 3.90%), Little Influence (*n* = 19; 9.40%), Some Influence (*n* = 52; 25.60%); Moderate Influence (*n* = 44; 21.70%); and Great Influence (*n* = 20; 9.90%). Subsequently, the following influential factors were also rated by the respondents regarding the levels of influence: *Student Importance*, No Influence (*n* = 5; 2.50%), Little Influence (*n* = 18; 8.90%), Some Influence (*n* = 54; 26.60%); Moderate Influence (*n* = 44; 21.70%); and Great Influence (*n* = 22; 10.80%); *Administration Importance*, No Influence (*n* = 12; 5.90%), Little Influence (*n* = 26; 12.80%), Some Influence (*n* = 53; 26.10%); Moderate Influence (*n* = 37; 18.20%); and Great Influence (*n* = 15; 7.40%); *Personal Ability to Teach*, No Influence (*n* = 2; 1.00%), Little Influence (*n* = 12; 5.90%), Some Influence (*n* = 50; 24.60%); Moderate Influence (*n* = 48; 23.60%); and Great Influence (*n* = 31; 15.30%); *Personal Interest in Teaching*, No Influence (*n* = 4; 2.00%), Little Influence (*n* = 11; 5.40%), Some Influence (*n* = 49; 24.10%); Moderate Influence (*n* = 48; 23.60%); and Great Influence (*n* = 31; 15.30%);

Experience in Teaching, No Influence (*n* = 2; 1.00%), Little Influence (*n* = 18; 8.90%), Some Influence (*n* = 45; 22.20%); Moderate Influence (*n* = 50; 24.60%); and Great Influence (*n* = 28; 13.80%). Finally, the following influential factors were also rated by the respondents regarding the levels of influence: *Facilities Available to Teach*, No Influence (*n* = 7; 3.40%), Little Influence (*n* = 20; 9.90%), Some Influence (*n* = 43; 21.20%); Moderate Influence (*n* = 43; 21.20%); and Great Influence (*n* = 30; 14.80%); *Equipment Available to Teach*, No Influence (*n* = 7; 3.40%), Little Influence (*n* = 22; 10.80%), Some Influence (*n* = 41; 20.20%); Moderate Influence (*n* = 44; 21.70%); and Great Influence (*n* = 29; 14.30%); and *Budget Available to Teach*, No Influence (*n* = 8; 3.90%), Little Influence (*n* = 25; 12.30%), Some Influence (*n* = 45; 22.20%); Moderate Influence (*n* = 35; 17.20%); and Great Influence (*n* = 30; 14.80%). These data are displayed in Table 22.

Table 22

Factors Influencing Missouri School-Based Agriculture Teachers to Instruct Finishing Curriculum (n = 140)

Factor	Levels of Influence 0		1		2		3		4			
	f	%	*f*	%	*f*	%	*f*	%	*f*	%	*M*	*SD*
Personal Importance	2	1.00	7	3.40	42	20.70	49	24.10	43	21.20	2.86	0.95
Personal Ability to Teach	2	1.00	12	5.90	50	24.60	48	23.60	31	15.30	2.66	0.96
Personal Interest in Teaching	4	2.00	11	5.40	49	24.10	48	23.60	31	15.30	2.63	0.99
Experience in Teaching	2	1.00	18	8.90	45	22.20	50	24.60	28	13.80	2.59	0.99
Facilities Available to Teach	7	3.40	20	9.90	43	21.20	43	21.20	30	14.80	2.48	1.12
Equipment Available to Teach	7	3.40	22	10.80	41	20.20	44	21.70	29	14.30	2.46	1.12
Student Importance	5	2.50	18	8.90	54	26.60	44	21.70	22	10.80	2.42	1.01
Budget Available to Teach	8	3.90	25	12.30	45	22.20	35	17.20	30	14.80	2.38	1.16
Community Importance	8	3.90	19	9.40	52	25.60	44	21.70	20	9.90	2.34	1.06
Administration Importance	12	5.90	26	12.80	53	26.10	37	18.20	15	7.40	2.12	1.09

Note. Levels of Influence: 0 to .50 = No Influence, .51 to 1.50 = Little Influence, 1.51 to 2.50 = Some Influence, 2.51 to 3.50 = Moderate Influence, 3.51 to 4.00 = Great Influence.

Research Question Four – Relationships of Curriculum Choice, Influential Factors, and Characteristics of the Respondents

Research question four sought to explain the relationship that potentially exists between the summated influential variables Importance of Teaching (personal importance, student importance, community importance, and administrative importance), and Level of Teacher Self-Efficacy(personal ability to teach, personal interest in teaching, and experience in teaching) when compared to the curriculum areas (Arc Welding, Project Construction, Oxy-Gas and Other Cutting/Welding Processes, Woodworking, Metals, and Finishing) found in the Missouri agricultural education course entitled Agricultural Construction 1 and/ or Agricultural Construction 2, and the demographic characteristics (sex, age, average number of hours spent in a week supervising student agricultural mechanics SAE projects, years of teaching experience, student enrollment in school-based agricultural education programs, university semester credit hours of agricultural mechanics coursework earned) of Missouri school-based agriculture teachers. A Simultaneous Multiple Linear Regression was used to determine if the independent variables (demographic characteristic) could be a predictor of either Importance of Teaching or Teacher Self-Efficacy (dependent variables) for each curriculum area.

Relationship of importance of teaching arc welding and demographic characteristics.

Simultaneous multiple linear regression was used to explain the relationship between the dependent variable, teachers' importance of teaching arc welding, to the independent variables, demographic characteristics (sex, age, university semester credit hours of agricultural mechanics coursework earned, years of teaching experience, student enrollment in a school-based agricultural education program in school-based agricultural education programs, average number of hours spent in a week supervising agricultural mechanics SAE projects, and type of teaching certification). Table 23 displays the regression model which depicts the demographic characteristics found to be significant in the regression equation for teachers' importance of teaching arc welding in the agricultural education course entitled Agricultural Construction 1 and/ or Agricultural Construction 2. Results indicate that 3% of teachers' importance of teaching arc welding can be explained by the model. Of the independent variables, the type of teaching certification, had the highest affect (β = -.09) on teachers' importance of teaching arc welding. The model was found to have a negligible effect size (Cohen's *d* = .03; Soper, 2010; Thalheimer & Cook, 2002). In summary, the independent variables: sex, age, university semester credit hours of agricultural mechanics coursework earned, years of teaching experience, student enrollment in a school-based agricultural education program in school-based agricultural education programs, average number of hours spent in a week supervising agricultural mechanics SAE projects, and type of teaching certification, could not explain the dependent variable, teacher's importance of teaching arc welding

(Adjusted R^2 = -.01; $F(7, 167) = 7.01$; $p < .05$). In conclusion, the model had little significance to explain a relationship.

Table 23

Summary of Simultaneous Multiple Linear Regression Analysis on the Importance of Teaching Arc Welding and Demographic Characteristics (n = 168)

Variable	R	R^2	b	β	t	p	VIF
Characteristics	.17	.03					
Sex[a]			11.47	.03	.34	.73	1.17
Age			.01	.06	.36	.72	3.96
University semester credit hours earned in agricultural mechanics coursework			.01	.07	.79	.43	1.14
Years of teaching experience			.02	.06	.39	.69	4.39
Student enrollment in school-based agricultural education programs			.01	.05	.59	.56	1.10
Average number of hours spent weekly supervising student agricultural mechanics SAE projects			.03	.07	.83	.41	1.05
Type of teaching certification[b]			-.38	-.09	-.96	.34	1.34
(Constant)			11.47		6.00	.01*	

Note. For the Model: F(7,167) = 7.01, Adjusted R^2 =-.01; p < .05; * p < .05.

Effect size = .03 (Negligible effect; Thalheimer & Cook, 2002).

Sex[a] Coded: Male = 1, Female = 2; Type of Teaching Certification[b] Coded: Traditional = 1, Alternative = 2.

Relationship of importance of teaching project construction and demographic characteristics.

Simultaneous multiple linear regression was used to explain the relationship between the dependent variable, teachers' importance of teaching project construction, to the independent variables, demographic characteristics (sex, age, university semester credit hours of agricultural mechanics coursework earned, years of teaching experience, student enrollment in a school-based agricultural education program in school-based agricultural education programs, average number of hours spent in a week supervising agricultural mechanics SAE projects, and type of teaching certification). Table 24 displays the regression model which depicts the demographic characteristics found to be significant in the regression equation for teachers' importance of teaching project construction in the agricultural education course entitled Agricultural Construction 1 and/or Agricultural Construction 2. Results indicate that 10% of teachers' importance of teaching project construction can be explained by the demographic characteristics. Of the independent variables, average number of hours spent in a week supervising agricultural mechanics SAE projects had the highest affect ($\beta = .18$) on teachers' importance of teaching project construction followed by student enrollment in school-based agricultural education programs ($\beta = .17$) and university semester credit hours of agricultural mechanics coursework earned ($\beta = .15$). The model was found to have a negligible effect size (Cohen's *d* = .11; Soper, 2010; Thalheimer & Cook, 2002). In summary, only three independent variables: university semester credit hours of agricultural mechanics coursework earned, student enrollment in school-based agricultural education programs, average number of hours spent in a week supervising agricultural mechanics SAE projects could explain the dependent variable, teacher's importance of teaching project construction (Adjusted $R^2 = .07$; $F(7, 175) = 2.75$; $p < .05$). The independent variables: sex, age, type of teacher certification, and years of teaching experience could not explain the dependent variable, teacher's importance of teaching project construction. Overall, the model had little significance to explain a relationship.

Table 24

Summary of Simultaneous Multiple Linear Regression Analysis on the Importance of Teaching Project Construction and Demographic Characteristics (*n* = 176)

Variable	*R*	R^2	*b*	*β*	*t*	*p*	VIF
Characteristics	.32	.10					
Sex[a]			.54	.07	.91	.36	1.16
Age			-.06	-.21	-1.36	.18	4.39
University semester credit hours earned in agricultural mechanics coursework			.04	.15	1.95	.05*	1.14
Years of teaching experience			.06	.20	1.22	.23	4.84
Student enrollment in school-based agricultural education programs			.01	.17	2.27	.03*	1.10
Average number of hours spent weekly supervising student agricultural mechanics SAE projects			.07	.18	2.44	.02*	1.05
Type of teaching certification[b]			-.35	-.07	-.83	.41	1.36
(Constant)			12.24		6.09	.01*	

Note. For the Model: $F(7,175) = 2.75$, Adjusted $R^2 = .07$; $p < .05$; * $p < .05$.

Effect size = .11 (Negligible effect; Thalheimer & Cook, 2002).

Sex[a] Coded: Male = 1, Female = 2; Type of Teaching Certification[b] Coded: Traditional = 1, Alternative = 2.

Relationship of importance of teaching oxygen/gas and other cutting/welding and demographic characteristics.

Simultaneous multiple linear regression was used to explain the relationship between the dependent variable, teachers' importance of teaching oxygen/gas and other cutting/welding processes, to the independent variables, demographic characteristics (sex, age, university semester credit hours of agricultural mechanics coursework earned, years of teaching experience, student enrollment in a school-based agricultural education program in school-based agricultural education programs, average number of hours spent in a week supervising agricultural mechanics SAE projects, and type of teaching certification). Table 25 displays the regression model which depicts the demographic characteristics found to be significant in the regression equation for teachers' importance of teaching oxygen/gas and other cutting/welding in the agricultural education course entitled Agricultural Construction 1 and/ or Agricultural Construction 2. Results indicate that 5% of teachers' importance of teaching oxygen/gas and other cutting/welding processes can be explained by the demographic characteristics. Of the independent variables, type of teaching certification had the highest affect ($\beta = -.19$) on teachers' importance of teaching oxygen/gas and other cutting/welding processes. The model was found to have a negligible effect size (Cohen's $d = .05$; Soper, 2010; Thalheimer & Cook, 2002). In summary, only one independent variable, type of teaching certification, can be used to explain the dependent variable, teacher's importance of teaching oxygen/gas and other cutting/welding processes (Adjusted $R^2 = .01$; $F(7, 167) = 1.19$; $p < .05$). However, the independent variables: sex, age, university semester credit hours of agricultural mechanics coursework earned, years of teaching experience, student enrollment in school-based agricultural education programs, and average number of hours spent in a week supervising agricultural mechanics SAE projects, could not explain the dependent variable, teacher's importance of teaching oxygen/gas and other cutting/welding processes (Adjusted $R^2 = .01$; $F(7, 167) = 1.19$; $p < .05$). However, the model had little significance to explain a relationship.

Table 25

Summary of Simultaneous Multiple Linear Regression Analysis on the Importance of Teaching Oxygen/Gas and Other Cutting/Welding Processes and Demographic Characteristics (n = 168)

Variable	R	R^2	b	β	t	p	VIF
Characteristics	.22	.05					
Sex[a]			.14	.02	.19	.85	1.15
Age			-.08	-.25	-1.65	.10	3.83
University semester credit hours earned in agricultural mechanics coursework			.02	.09	1.04	.30	1.13
Years of teaching experience			.10	.30	1.90	.06	4.24
Student enrollment in school-based agricultural education programs			.01	.05	.62	.54	1.10
Average number of hours spent weekly supervising student agricultural mechanics SAE projects			.01	.01	.15	.88	1.05
Type of teaching certification[b]			-1.01	-.19	-2.10	.04*	1.30
(Constant)			14.46		6.36	.01*	

Note. For the Model: $F(7,167) = 1.19$, Adjusted $R^2 = .01$; $p < .05$; * $p < .05$.

Effect size = .05 (Negligible effect; Thalheimer & Cook, 2002).

Sex[a] Coded: Male = 1, Female = 2; Type of Teaching Certification[b] Coded: Traditional = 1, Alternative = 2.

Relationship of importance of teaching woodworking and demographic characteristics.

Simultaneous multiple linear regression was used to explain the relationship between the dependent variable, teachers' importance of teaching woodworking, to the independent variables, demographic characteristics (sex, age, university semester credit hours of agricultural mechanics coursework earned, years of teaching experience, student enrollment in a school-based agricultural education program in school-based agricultural education programs, average number of hours spent in a week supervising agricultural mechanics SAE projects, and type of teaching certification). Table 26 displays the regression model which depicts the demographic characteristics found to be significant in the regression equation for teachers' importance of teaching woodworking in the agricultural education course entitled Agricultural Construction 1 and/ or Agricultural Construction 2. Results indicate that 4% of teachers' importance of teaching woodworking can be explained by the model. Of the independent variables, sex had the highest affect ($\beta = .14$) on teachers' importance of teaching woodworking. The model was found to have a negligible effect size (Cohen's $d = .04$; Soper, 2010; Thalheimer & Cook, 2002). In summary, none of the independent variables: sex, age, university semester credit hours of agricultural mechanics coursework earned, years of teaching experience, student enrollment in a school-based agricultural education program in school-based agricultural education programs, average number of hours spent in a week supervising agricultural mechanics SAE projects, and type of teaching certification, could explain the dependent variable, teacher's importance of teaching woodworking (Adjusted

$R^2 = -.02$; $F(7, 119) = 0.74$; $p < .05$). However, the model had little significance to explain a relationship.

Table 26

Summary of Simultaneous Multiple Linear Regression Analysis on the Importance of Teaching Woodworking and Demographic Characteristics (n = 120)

Variable	R	R^2	b	β	t	p	VIF
Characteristics	.21	.04					
Sex[a]			1.13	.14	1.41	.16	1.12
Age			.02	.07	.36	.72	4.71
University semester credit hours earned in agricultural mechanics coursework			.01	.06	.60	.55	1.17
Years of teaching experience			.01	-.01	-.01	.99	4.97
Student enrollment in school-based agricultural education programs			-.01	-.06	-.62	.53	1.08
Average number of hours spent weekly supervising student agricultural mechanics SAE projects			.02	.05	.54	.59	1.08
Type of teaching certification[b]			-.69	-.13	-1.23	.22	1.32
(Constant)			10.12		3.96	.01*	

Note. For the Model: $F(7,119) = 0.74$, Adjusted $R^2 = -.02$; $p < .05$; * $p < .05$.

Effect size = .04 (Negligible effect; Thalheimer & Cook, 2002).

Sex[a] Coded: Male = 1, Female = 2; Type of Teaching Certification[b] Coded: Traditional = 1, Alternative = 2.

Relationship of the importance of teaching metals and demographic characteristics.

Simultaneous multiple linear regression was used to explain the relationship between the dependent variable, teachers' importance of teaching metals, to the independent variables, demographic characteristics (sex, age, university semester credit hours of agricultural mechanics coursework earned, years of teaching experience, student enrollment in a school-based agricultural education program in school-based agricultural education programs, average number of hours spent in a week supervising agricultural mechanics SAE projects, and type of teaching certification). Table 27 displays the regression model which depicts the demographic characteristics found to be significant in the regression equation for teachers' importance of teaching metals in the agricultural education course entitled Agricultural Construction 1 and/ or Agricultural Construction 2. Results indicate that 7% of teachers' importance of teaching metals can be explained by the demographic characteristics. Of the independent variables, average number of hours spent in a week supervising agricultural mechanics SAE projects had the highest affect ($\beta = .24$) on teachers' importance of teaching metals. The model was found to have a negligible effect size (Cohen's $d = .07$; Soper, 2010; Thalheimer & Cook, 2002). In summary, the independent variable, average number of hours spent in a week supervising agricultural mechanics SAE projects, was the only variable that could explain the dependent variable, teacher's importance of teaching metals (Adjusted $R^2 = .02$; $F(7, 135) = 1.35$; $p < .05$). However, none of the remaining independent variables: sex, age, university semester credit hours of agricultural mechanics coursework earned, years of teaching experience, student enrollment in a school-based agricultural education program in school-based agricultural education programs, and type of teaching certification, could explain the dependent variable, teacher's importance of teaching metals (Adjusted R^2 = .02; $F(7, 135) = 1.35$; $p < .05$). However, the model had little significance to explain a relationship.

Table 27

Summary of Simultaneous Multiple Linear Regression Analysis on the Importance *of Teaching Metals and Demographic Characteristics* (*n* = 136)

Variable	*R*	R^2	*b*	*β*	*t*	*p*	VIF
Characteristics	.26	.07					
Sex[a]			.43	.05	.50	.62	1.13
Age			-.02	-.06	-.35	.73	4.27
University semester credit hours earned in agricultural mechanics coursework			-.01	-.02	-.20	.84	1.11
Years of teaching experience			.03	.09	.49	.63	4.67
Student enrollment in school-based agricultural education programs			.01	.04	.46	.65	1.10
Average number of hours spent weekly supervising student agricultural mechanics SAE projects			.11	.24	2.66	.01*	1.09
Type of teaching certification[b]			.29	.05	.51	.61	1.36
(Constant)			7.34		2.78	.01*	

Note. For the Model: $F(7{,}135) = 1.35$, Adjusted $R^2 = .02$; $p < .05$; * $p < .05$.

Effect size = .07 (Negligible effect; Thalheimer & Cook, 2002).

Sex[a] Coded: Male = 1, Female = 2; Type of Teaching Certification[b] Coded: Traditional = 1, Alternative = 2.

Relationship of importance of teaching finishing and demographic characteristics.

Simultaneous multiple linear regression was used to explain the relationship between the dependent variable, teachers' importance of teaching finishing, to the independent variables, demographic characteristics (sex, age, university semester credit hours of agricultural mechanics coursework earned, years of teaching experience, student enrollment in a school-based agricultural education program in school-based agricultural education programs, average number of hours spent in a week supervising agricultural mechanics SAE projects, and type of teaching certification). Table 28 displays the regression model which depicts the demographic characteristics found to be significant in the regression equation for teachers' importance of teaching finishing in the agricultural education course entitled Agricultural Construction 1 and/ or Agricultural Construction 2. Results indicate that 5% of teachers' importance of teaching finishing can be explained by the model. Of the independent variables, student enrollment in a school-based agricultural education program had the highest affect (β = .16) on teachers' importance of teaching finishing. The model was found to have a negligible effect size (Cohen's *d* = .04; Soper, 2010; Thalheimer & Cook, 2002). In summary, none of the independent variables: sex, age, university semester credit hours of agricultural mechanics coursework earned, years of teaching experience, student enrollment in a school-based agricultural education program in school-based agricultural education programs, average number of hours spent in a week supervising agricultural mechanics SAE projects, and type of teaching certification, could explain the dependent variable, teacher's importance of teaching finishing (Adjusted R^2 = -.01; $F(7, 138) = 0.92$; $p < .05$). However, the model had little significance to explain a relationship.

Table 28

Summary of Simultaneous Multiple Linear Regression Analysis on the Importance of Teaching Finishing and Demographic Characteristics (n = 139)

Variable	R	R^2	b	β	t	p	VIF
Characteristics	.22	.05					
Sex[a]			1.01	.11	1.24	.22	1.13
Age			-.04	-.11	-.59	.56	5.13
University semester credit hours earned in agricultural mechanics coursework			.01	.03	.30	.77	1.38
Years of teaching experience			.05	.14	.71	.48	5.15
Student enrollment in school-based agricultural education programs			.01	.16	1.82	.07	1.09
Average number of hours spent weekly supervising student agricultural mechanics SAE projects			.04	.08	.92	.36	1.07
Type of teaching certification[b]			-.42	-.07	-.74	.46	1.25
(Constant)			9.38		3.42	.01*	

Note. For the Model: $F(7,138) = 0.92$, Adjusted $R^2 = -.01$; $p < .05$; * $p < .05$.

Effect size = .04 (Negligible effect; Thalheimer & Cook, 2002).

Sex[a] Coded: Male = 1, Female = 2; Type of Teaching Certification[b] Coded: Traditional = 1, Alternative = 2.

Relationship of the level of teachers' self-efficacy on teaching arc welding and demographic characteristics.

Simultaneous multiple linear regression was used to explain the relationship between the dependent variable, teachers' self-efficacy of teaching arc welding, to the independent variables, demographic characteristics (sex, age, university semester credit hours of agricultural mechanics coursework earned, years of teaching experience, student enrollment in a school-based agricultural education program in school-based agricultural education programs, average number of hours spent in a week supervising agricultural mechanics SAE projects, and type of teaching certification). Table 29 displays the regression model which depicts the demographic characteristics found to be significant in the regression equation for teachers' self-efficacy of teaching arc welding in the agricultural education course entitled Agricultural Construction 1 and/ or Agricultural Construction 2. Results indicate that 11% of teachers' self-efficacy of teaching arc welding can be explained by the demographic characteristics. Of the independent variables, university semester credit hours earned in agricultural mechanics coursework ($\beta = .19$) and sex ($\beta = -.19$) had the highest affect on teachers' self-efficacy to teach arc welding followed by age ($\beta = .17$). The model was found to have a negligible effect size (Cohen's $d = .11$; Soper, 2010; Thalheimer & Cook, 2002). In summary, the independent variables: sex, age, and university semester credit hours of agricultural mechanics coursework earned, can explain the dependent variable, teacher's self-efficacy of teaching arc welding (Adjusted $R^2 = .07$; $F(7, 167) = 2.70$; $p < .05$). However, the independent variables: years of teaching experience, student enrollment in school-based agricultural education programs, average number of hours spent in a week supervising agricultural mechanics SAE projects, and type of teaching certification, could not explain the dependent variable, teacher's self-efficacy of teaching arc welding. However, the model had little significance to explain a relationship.

Table 29

Summary of Simultaneous Multiple Linear Regression Analysis of Level of Teacher Self-Efficacy on Teaching Arc Welding and Demographic Characteristics (n = 168)

Variable	R	R^2	b	β	t	p	VIF
Characteristics	.33	.11					
Sex[a]			-1.29	-.19	-2.41	.02*	1.17
Age			-.03	-.13	-.85	.40	3.96
University semester credit hours earned in agricultural mechanics coursework			.04	.19	2.32	.02*	1.14
Years of teaching experience			.01	.03	.18	.86	4.39
Student enrollment in school-based agricultural education programs			.01	.03	.40	.69	1.10
Average number of hours spent weekly supervising student agricultural mechanics SAE projects			.06	.17	2.25	.03*	1.05
Type of teaching certification[b]			.28	.07	.77	.44	1.34
(Constant)			10.53		6.00	.01*	

Note. For the Model: $F(7,167) = 2.70$, Adjusted $R^2 = .07$; $p < .05$; * $p < .05$.

Effect size = .11 (Negligible effect; Thalheimer & Cook, 2002).

Sex[a] Coded: Male = 1, Female = 2; Type of Teaching Certification[b] Coded: Traditional = 1, Alternative = 2.

Relationship of the level of teachers' self-efficacy on teaching project construction and demographic characteristics.

Simultaneous multiple linear regression was used to explain the relationship between the dependent variable, teachers' self-efficacy of teaching project construction, to the independent variables, demographic characteristics (sex, age, university semester credit hours of agricultural mechanics coursework earned, years of teaching experience, student enrollment in a school-based agricultural education program in school-based agricultural education programs, average number of hours spent in a week supervising agricultural mechanics SAE projects, and type of teaching certification). Table 30 displays the regression model which depicts the demographic characteristics found to be significant in the regression equation for teachers' self-efficacy of teaching project construction in the agricultural education course entitled Agricultural Construction 1 and/ or Agricultural Construction 2. Results indicate that 16% of teachers' self-efficacy of teaching project construction can be explained by the demographic characteristics. Of the independent variables, average number of hours spent in a week supervising agricultural mechanics SAE projects ($\beta = .25$) had the highest affect on teachers' self-efficacy to teach project construction followed by university semester credit hours of agricultural mechanics coursework earned ($\beta = .22$). The model was found to have a small effect size (Cohen's $d = .19$; Soper, 2010; Thalheimer & Cook, 2002). In summary, the independent variables: average number of hours spent in a week supervising agricultural mechanics SAE projects and university semester credit hours of agricultural mechanics coursework earned can explain the dependent variable, teacher's self-efficacy of teaching project construction (Adjusted $R^2 = .13$; $F(7, 175) = 4.67$; $p < .05$). Furthermore, the following independent variables: sex, age, years of teaching experience, student enrollment in school-based agricultural education programs, and type of teaching certification could not explain the dependent variable, teacher's self-efficacy of teaching project construction. However, the model had little significance to explain a relationship.

Table 30

Summary of Simultaneous Multiple Linear Regression Analysis of Level of Teacher Self-Efficacy on Teaching Project Construction and Demographic Characteristics (n = 176)

Variable	R	R^2	b	β	t	p	VIF
Characteristics	.40	.16					
Sex[a]			-.74	-.11	-1.47	.14	1.16
Age			.04	.14	.95	.34	4.39
University semester credit hours earned in agricultural mechanics coursework			.05	.22	2.95	.01*	1.14
Years of teaching experience			-.04	-.15	-.97	.33	4.84
Student enrollment in school-based agricultural education programs			.01	.14	1.90	.06	1.09
Average number of hours spent weekly supervising student agricultural mechanics SAE projects			.09	.25	3.45	.01*	1.05
Type of teaching certification[b]			.49	.12	1.40	.16	1.36
(Constant)			6.70		3.95	.01*	

Note. For the Model: $F(7,175) = 4.67$, Adjusted $R^2 = .13$; p < .05; * p < .05.

Effect size = .19 (Small effect; Thalheimer & Cook, 2002).

Sex[a] Coded: Male = 1, Female = 2; Type of Teaching Certification[b] Coded: Traditional = 1, Alternative = 2.

Relationship of the level of teachers' self-efficacy on teaching oxy-gas and other cutting/welding processes and demographic characteristics.

Simultaneous multiple linear regression was used to explain the relationship between the dependent variable, teachers' self-efficacy of teaching oxy-gas and other cutting/welding processes, to the independent variables, demographic characteristics (sex, age, university semester credit hours of agricultural mechanics coursework earned, years of teaching experience, student enrollment in a school-based agricultural education program in school-based agricultural education programs, average number of hours spent in a week supervising agricultural mechanics SAE projects, and type of teaching certification). Table 31 displays the regression model which depicts the demographic characteristics found to be significant in the regression equation for teachers' self-efficacy of teaching oxy-gas and other cutting/welding processes in the agricultural education course entitled Agricultural Construction 1 and/ or Agricultural Construction 2. Results indicate that 6% of teachers' self-efficacy of teaching oxy-gas and other cutting/welding processes can be explained by the demographic characteristics. Of the independent variables, university semester credit hours earned in agricultural mechanics coursework (β = .21) had the highest affect on teachers' self-efficacy to teach oxy-gas and other cutting/welding processes. The model was found to have a negligible effect size (Cohen's *d* = .06; Soper, 2010; Thalheimer & Cook, 2002). In summary, the independent variable university semester credit hours of agricultural mechanics coursework earned could explain the dependent variable, teacher's self-efficacy of teaching oxy-gas and other cutting/welding processes (Adjusted R^2 = .02; $F(7, 167) = 1.47$; $p < .05$). However, the independent variables: sex, age, years of teaching experience, student enrollment in a school-based agricultural education program in school-based agricultural education programs, average number of hours spent in a week supervising agricultural mechanics SAE projects, and type of teaching certification, could not explain the dependent variable, teacher's self-efficacy of teaching oxy-gas and other cutting/welding processes. Furthermore, the model had little significance to explain a relationship.

Table 31

Summary of Simultaneous Multiple Linear Regression Analysis of Level of Teacher Self-Efficacy on Teaching Oxy/Gas and Other Cutting/Welding and Demographic Characteristics (n = 168)

Variable	R	R^2	b	β	t	p	VIF
Characteristics	.25	.06					
Sex[a]			-.15	-.02	-.24	.81	1.15
Age			.03	.10	.64	.53	3.83
University semester credit hours earned in agricultural mechanics coursework			.05	.21	2.62	.01*	1.13
Years of teaching experience			-.01	-.04	-.27	.79	4.24
Student enrollment in school-based agricultural education programs			.01	.01	.10	.92	1.10
Average number of hours spent weekly supervising student agricultural mechanics SAE projects			.01	.03	.36	.72	1.05
Type of teaching certification[b]			-.06	-.01	-.14	.89	1.30
(Constant)			7.73		4.03	.01*	

Note. For the Model: $F(7,167) = 1.47$, Adjusted $R^2 = .02$; $p < .05$; * $p < .05$.

Effect size = .06 (Negligible effect; Thalheimer & Cook, 2002).

Sex[a] Coded: Male = 1, Female = 2; Type of Teaching Certification[b] Coded: Traditional = 1, Alternative = 2.

Relationship of the level of teachers' self-efficacy on teaching woodworking and demographic characteristics.

Simultaneous multiple linear regression was used to explain the relationship between the dependent variable, teachers' self-efficacy of teaching woodworking, to the independent variables, demographic characteristics (sex, age, university semester credit hours of agricultural mechanics coursework earned, years of teaching experience, student enrollment in a school-based agricultural education program in school-based agricultural education programs, average number of hours spent in a week supervising agricultural mechanics SAE projects, and type of teaching certification). Table 32 displays the regression model which depicts the demographic characteristics found to be significant in the regression equation for teachers' self-efficacy of teaching woodworking in the agricultural education course entitled Agricultural Construction 1 and/ or Agricultural Construction 2. Results indicate that 8% of teachers' self-efficacy of teaching woodworking can be explained by the demographic characteristics. Of the independent variables, university semester credit hours earned in agricultural mechanics coursework (β = .21) had the highest affect on teachers' self-efficacy to teach woodworking. The model was found to have a negligible effect size (Cohen's d = .08; Soper, 2010; Thalheimer & Cook, 2002). In summary, the independent variable university semester credit hours of agricultural mechanics coursework earned, could explain the dependent variable, teacher's self-efficacy of teaching woodworking (Adjusted R^2 = .02; $F(7, 167)$ = 1.47; $p < .05$). However, the independent variables: sex, age, university semester credit hours of agricultural mechanics coursework earned, years of teaching experience, student enrollment in school-based agricultural education programs, average number of hours spent in a week supervising agricultural mechanics SAE projects, and type of teaching certification could not explain the dependent variable, teacher's self-efficacy of teaching woodworking. In conclusion, the model had little significance to explain a relationship.

Table 32

Summary of Simultaneous Multiple Linear Regression Analysis of Level of Teacher Self-Efficacy on Teaching Woodworking and Demographic Characteristics (n = 120)

Variable	R	R^2	b	β	t	p	VIF
Characteristics	.27	.08					
Sex[a]			.80	.10	1.07	.29	1.12
Age			.07	.13	.67	.51	4.71
University semester credit hours earned in agricultural mechanics coursework			.05	.21	2.12	.04*	1.17
Years of teaching experience			-.03	-.08	-.41	.68	4.97
Student enrollment in school-based agricultural education programs			-.01	-.05	-.55	.59	1.08
Average number of hours spent weekly supervising student agricultural mechanics SAE projects			-.01	-.03	-.36	.72	1.08
Type of teaching certification[b]			-.50	-.10	-.95	.34	1.32
(Constant)			7.39		3.12	.01*	

Note. For the Model: $F(7,167) = 1.47$, Adjusted $R^2 = .02$; $p < .05$; * $p < .05$.

Effect size = .08 (Negligible effect; Thalheimer & Cook, 2002).

Sex[a] Coded: Male = 1, Female = 2; Type of Teaching Certification[b] Coded: Traditional = 1, Alternative = 2.

Relationship of level of teachers' self-efficacy to teach metals and demographic characteristics.

Simultaneous multiple linear regression was used to explain the relationship between the dependent variable, teachers' self-efficacy of teaching metals, to the independent variables, demographic characteristics (sex, age, university semester credit hours of agricultural mechanics coursework earned, years of teaching experience, student enrollment in a school-based agricultural education program in school-based agricultural education programs, average number of hours spent in a week supervising agricultural mechanics SAE projects, and type of teaching certification). Table 33 displays the regression model which depicts the demographic characteristics found to be significant in the regression equation for teachers' self-efficacy of teaching metals in the agricultural education course entitled Agricultural Construction 1 and/ or Agricultural Construction 2. Results indicate that 5% of teachers' self-efficacy of teaching metals can be explained by the model. Of the independent variables, university semester credit hours earned in agricultural mechanics coursework ($\beta = .14$) had the highest affect on teachers' self-efficacy to teach metals. The model was found to have a negligible effect size (Cohen's *d* = .05; Soper, 2010; Thalheimer & Cook, 2002). In summary, the independent variables: sex, age, university semester credit hours of agricultural mechanics coursework earned, years of teaching experience, student enrollment in a school-based agricultural education program in school-based agricultural education programs, average number of hours spent in a week supervising agricultural mechanics SAE projects, and type of teaching certification, could not explain the dependent variable, teacher's self-efficacy of teaching metals (Adjusted R^2 = -.01; $F(7, 135) = 0.93$; $p < .05$). However, the model had little significance to explain a relationship.

Table 33

Summary of Simultaneous Multiple Linear Regression Analysis of Level of Teacher Self-Efficacy on Teaching Metals and Demographic Characteristics (n = 136)

Variable	R	R^2	b	β	t	p	VIF
Characteristics	.22	.05					
Sex[a]			-.32	-.04	-.42	.68	1.13
Age			.03	.12	.67	.50	4.27
University semester credit hours earned in agricultural mechanics coursework			.03	.14	1.55	.12	1.11
Years of teaching experience			-.02	-.06	-.30	.76	4.67
Student enrollment in school-based agricultural education programs			.01	.10	1.08	.28	1.10
Average number of hours spent weekly supervising student agricultural mechanics SAE projects			.02	.06	.66	.51	1.10
Type of teaching certification[b]			.13	.03	.26	.80	1.36
(Constant)			5.57		2.42	.02*	

Note. For the Model: $F(7,135) = 0.93$, Adjusted $R^2 = -.01$; $p < .05$; * $p < .05$.

Effect size = .05 (Negligible effect; Thalheimer & Cook, 2002).

Sex[a] Coded: Male = 1, Female = 2; Type of Teaching Certification[b] Coded: Traditional = 1, Alternative = 2.

Relationship of level of teachers' self-efficacy to teach finishing and demographic characteristics.

Simultaneous multiple linear regression was used to explain the relationship between the dependent variable, teachers' self-efficacy of teaching finishing, to the independent variables, demographic characteristics (sex, age, university semester credit hours of agricultural mechanics coursework earned, years of teaching experience, student enrollment in a school-based agricultural education program in school-based agricultural education programs, average number of hours spent in a week supervising agricultural mechanics SAE projects, and type of teaching certification). Table 34 displays the regression model which depicts the demographic characteristics found to be significant in the regression equation for teachers' self-efficacy of teaching finishing in the agricultural education course entitled Agricultural Construction 1 and/ or Agricultural Construction 2. Results indicate that 7% of teachers' self-efficacy of teaching finishing can be explained by the demographic characteristics. Of the independent variables, average number of hours spent in a week supervising agricultural mechanics SAE projects ($\beta = .19$) had the highest affect on teachers' self-efficacy to teach finishing. The model was found to have a negligible effect size (Cohen's $d = .07$; Soper, 2010; Thalheimer & Cook, 2002). In summary, the independent variable average number of hours spent in a week supervising agricultural mechanics SAE projects, could explain the dependent variable, teacher's self-efficacy of teaching finishing (Adjusted $R^2 = .02$; $F(7, 138) = 1.45$; $p < .05$). However, the independent variables: sex, age, university semester credit hours of agricultural mechanics coursework earned, years of teaching experience, student enrollment in school-based agricultural education programs, and type of teaching certification could not explain the dependent variable, teacher's self-efficacy of teaching finishing. Furthermore, the model had little significance to explain a relationship.

Table 34

Summary of Simultaneous Multiple Linear Regression Analysis of Level of Teacher Self-Efficacy on Teaching Finishing and Demographic Characteristics (*n* = 139)

Variable	*R*	R^2	*b*	*β*	*t*	*p*	VIF
Characteristics	.27	.07					
Sex[a]			.54	.08	.84	.40	1.13
Age			-.02	-.08	-.42	.68	5.13
University semester credit hours earned in agricultural mechanics coursework			.04	.16	1.59	.12	1.38
Years of teaching experience			.01	.04	.20	.85	5.15
Student enrollment in school-based agricultural education programs			.01	.07	.82	.41	1.09
Average number of hours spent weekly supervising student agricultural mechanics SAE projects			.07	.19	2.22	.03*	1.07
Type of teaching certification[b]			-.12	-.03	-.27	.79	1.25
(Constant)			7.09		3.35	.01*	

Note. For the Model: $F(7,138) = 1.45$, Adjusted $R^2 = .02$; $p < .05$; * $p < .05$.

Effect size = .07 (Negligible effect; Thalheimer & Cook, 2002).

Sex[a] Coded: Male = 1, Female = 2; Type of Teaching Certification[b] Coded: Traditional = 1, Alternative = 2.

CHAPTER FIVE

SUMMARY, CONCLUSIONS, IMPLICATIONS, AND RECOMMENDATIONS

Summary

Chapter Five contains the summary, conclusions, implications, and recommendations for each research question found within this study. Recommendations for future research are also offered by the researcher.

Purpose of the Study

The purpose of this study was to determine the self- perceived factors that influence Missouri school-based agriculture teachers' choice to teach specific components of the Agricultural Construction 1 and/or Agricultural Construction 2 curriculum.

Research Questions

The following research questions were developed to guide this study:

1. What are the personal, professional, and program characteristics (age, sex, years of teaching experience, type of teacher certification, university semester

credit hours earned in agricultural mechanics, student enrollment, time spent supervising student agricultural mechanics Supervised Agricultural Experience (SAE) projects per week, student participation in agricultural mechanics related events, university from which undergraduate degree was earned, FFA area in which school of employment is located, and satisfaction with the teacher education program from which certification was earned regarding preparation to teach agricultural mechanics) of school-based agricultural educators in Missouri who teach Agricultural Construction 1 and/or Agricultural Construction 2?

2. Which of the selected components of the Agricultural Construction 1 and/or Agricultural Construction 2 curriculum do school-based agricultural educators in Missouri teach?

3. What self- perceived factors influence Missouri school-based agricultural educators' decisions to teach selected curriculum components in Agricultural Construction 1 and Agricultural Construction 2?

4. Does a relationship exist between and among teachers' choice to teach selected components of the Agricultural Construction 1 and/or Agricultural Construction 2 curriculum, the self- perceived factors that influence teachers decision to teach selected components of the Agricultural Construction 1 and/or Agricultural Construction 2 curriculum, and their personal, professional, and program characteristics (age, sex, years of teaching experience, university semester credit hours earned in agricultural mechanics, student enrollment in a

school-based agricultural education program, type of teacher certification, and time spent supervising student agricultural mechanics SAE projects per week)?

Limitations of the Study

This study was limited to school-based agricultural educators in Missouri who instruct the agricultural education coursed entitled Agricultural Construction 1 and/or Agricultural Construction 2. The results of this study are perceptions of factors that influence these teachers to instruct various curriculum components of the agricultural education course entitled Agricultural Construction 1 and/or Agricultural Construction 2; therefore, the results are not actual values. In addition, the results of this study cannot be generalized to any other group beyond the scope of the population.

Research Design

This study utilized descriptive and correlational research methods. Consistent with the literature on research design, a tailored, electronic approach of data collection was employed using an online, web based instrument to gather information necessary to accomplish the purpose and objectives of the study (Dillman, 2007). Correlational research methods were used to investigate potential relationships between variables of interest (Gall, Gall, & Borg, 2003). Correlational research was used to address the magnitude and direction of relationships among selected variables (Ary, Jacobs, & Razavieh, 2002). Researchers sought to address the relationships that exist between and among teachers' choice to teach selected components of the Agricultural Construction 1 and/or Agricultural Construction 2 curriculum, the self- perceived factors that influence teacher's decision to teach selected components of the Agricultural Construction 1 and/or Agricultural Construction 2 curriculum, and their personal, professional, and program characteristics (age, sex, years of teaching experience, university semester credit hours earned in agricultural mechanics, student enrollment in a school-based agricultural education program, type of teacher certification, and time spent supervising student agricultural mechanics SAE projects per week).

In this study, there were ten dependent variables developed from the Theory of Planned Behavior (Ajzen, 1991), the Theory of Self-Efficacy (Bandura, 1997), and the Expectancy Value Theory of Achievement Motivation (Atkinson, 1957). These factors included: (1) Importance the teacher placed on teaching the selected components of the Agricultural Construction 1 and/or Agricultural Construction 2 curriculum; (2) Importance the community placed on the teacher teaching the selected components of the Agricultural Construction 1 and/or Agricultural Construction 2 curriculum to students; (3) Importance students placed on being taught the selected components of the Agricultural Construction 1 and/or Agricultural Construction 2 curriculum; (4) Importance that the administration places on the teacher teaching the selected components of the Agricultural Construction 1 and/or Agricultural Construction 2 curriculum to students; (5) Teacher's ability to teach the selected components of the Agricultural Construction 1 and/or Agricultural Construction 2 curriculum to students; (6) Teacher's personal interest in teaching the selected components of the Agricultural Construction 1 and/or Agricultural Construction 2 curriculum to students; (7) Teacher's experience in teaching the selected components of the Agricultural Construction 1 and/or

Agricultural Construction 2 curriculum to students; (8) Facilities available to the teacher to teach the selected components of the Agricultural Construction 1 and/or Agricultural Construction 2 curriculum to students; (9) Equipment available to the teacher to teach the selected components of the Agricultural Construction 1 and/or Agricultural Construction 2 curriculum to students, and; (10) Budget available to teach the selected components of the Agricultural Construction 1 and/or Agricultural Construction 2 curriculum to students.

In addition, there were several independent variables of interest. These variables of interest include: (1) age; (2) sex; (3) number of agricultural mechanics semester credit hours completed at the university level; (4) years of teaching experience; (5) current student enrollment in a school-based agricultural education program of the agricultural education program; (6) type of teacher certification; and (7) average number of hours per week spent supervising agricultural mechanics SAE projects.

Population

The target population consisted of all school-based agriculture teachers in Missouri, who at the time of the study, taught Agricultural Construction 1 and/or Agricultural Construction 2 (N = 257). The frame for this study was obtained from the *2009-2010 Missouri Agricultural Education Directory*, published by the Missouri Department of Elementary and Secondary Education. All school-based agriculture teachers in Missouri (N = 494) were surveyed to determine if they taught Agricultural Construction 1 and/or Agricultural Construction 2. This group was contacted up to seven times using a modified Tailored Design Method (Dillman, 2007). The initial contact was an e-mail pre-notice. Next, there were up to five e-mail invitations for participants to complete the online data collection instrument. Finally, a phone call was placed to non-respondents to urge them to give them one final opportunity to complete the questionnaire. This process yielded a response rate of 93.72% (n = 464) from respondents. Of those respondents, 257 (55.38%) of the agriculture teachers indicated that they teach Agricultural Construction 1 and/or Agricultural Construction 2. This group formed the population frame for this study.

A census of the population was used for three reasons. First, all teachers were accessible because of the availability of their school e-mail addresses from the *2009-2010 Missouri Agricultural Education Directory* (Missouri Department of Elementary and Secondary Education, 2009). Second, by distributing the instrument to teachers online, cost was of little factor. Finally, the number of subjects in the population was manageable.

Instrumentation

Data were collected through one primary method, a researcher-designed, web-based questionnaire. A link to the instrument, called the Missouri Agricultural Mechanics Assessment (Appendix A), was distributed to all subjects to obtain quantitative information relating to the self-perceived factors that influence teachers to teach the curriculum found within this course. A web-based instrument was utilized due to the advantages it offers over other data collection methods in terms of timeliness of responses, ease of data analysis, and reduced expense. The questionnaire was developed and distributed using Hosted Survey™, a web-hosted software application. Hosted Survey™ was selected due to affordable academic pricing, flexibility in question formatting and design options, and excellent customer service.

The Missouri Agricultural Mechanics Assessment data collection instrument was created by the researcher. Section I was composed of questions related to the instruction of six skill-related curriculum areas included in the Agricultural Construction 1 and/or Agricultural Construction 2 curriculum. This section also contained questions relating to the self-perceived factors that influence, or do not influence, a teacher to teach the selected components of the curriculum. The six skill-related curriculum areas of Agricultural Construction 1 and/or Agricultural Construction 2 include: Arc Welding, Project Construction, Oxy-Gas and Other Cutting/Welding Processes, Woodworking, Metals, and Finishing.

Regarding each selected curriculum area, teachers were asked whether or not they taught all or part of the curriculum. Based upon their response, either yes or no, the participant was then directed to a specific part of the instrument. If the response was yes, participants were provided a list of ten factors to consider regarding their decision to teach that component of the curriculum. These ten factors were developed by the researcher and were based upon the Theory of Planned Behavior (Ajzen, 1991), the Theory of Self- Efficacy (Bandura, 1997), and the Expectancy Value Theory of Achievement Motivation (Atkinson, 1957). If the response was no, participants were provided the same list of ten factors to consider regarding their decision not to teach that component of the curriculum. A five-point, Likert-type scale was offered for participants to provide information about factors that influence their decision to whether or not to teach, that curriculum component. The response scale for each factor was: 0 = no influence, 1 = little influence, 2 = some influence, 3 = moderate influence, and 4 = great influence. Finally, subjects were asked to determine the number of days they spent teaching each of the six skill-related curriculum areas of Agricultural Construction 1 and/or Agricultural Construction within a typical academic year.

Section II of the instrument consisted of ten factors designed to collect information concerning personal, professional and program information about the participants and the school-based agricultural education program in which they teach. Participants were also extended an opportunity to write any additional comments concerning the teaching of Agricultural Construction 1 and/or Agricultural Construction 2, the agricultural mechanics curriculum in Missouri, the self- perceived factors that influence a teacher to teach certain agricultural mechanics topics, or any other topic that they found important and was not addressed in the instrument by the researcher.

Validity of the instrument

To ensure validity of the Missouri Agricultural Mechanics Assessment instrument, face and content validity were addressed with the use of a panel of experts. The panel of experts consisted of three university faculty members familiar with agricultural education curriculum at the secondary level, two university faculty members familiar with agricultural mechanics curriculum at the secondary level, one university faculty member familiar with research design and instrument development, and one graduate student with previous experience teaching school-based agricultural education. Minor modifications were made to the instrument as a result of feedback provided by the panel and the instrument was judged to be valid.

Reliability of the instrument

To ensure the reliability of the Missouri Agricultural Mechanics Assessment instrument, the researcher utilized a pilot test consisting of 23 school-based agriculture teachers in Kentucky. These teachers were selected for several reasons including their similarity to the target population in Missouri, their familiarity with agricultural mechanics curriculum, and because they taught an agricultural education course entitled Agricultural Construction Skills. Members of the pilot group were asked, via e-mail, to complete the instrument and share their concerns and/or suggestions for improvement. Of the 23 teachers contacted, 22 (95.65%) completed all items in Sections I and II. Results of this pilot study were used to establish the reliability of the instrument.

For this study, reliability coefficients for the constructs found in Section I of the Missouri Agricultural Mechanics Assessment were calculated using the pilot test data. Cronbach's alpha, the most common form of internal consistency as an estimate for reliability, was used. Miller, Torres, and Lindner (2004) noted that Cronbach's alpha coefficient can be used when items have multiple response categories such as the Likert-type response categories present in the first section of the questionnaire used in this study, and "will provide an appropriate estimate of reliability" (p. 15). The resulting

Cronbach's alpha coefficients ranged from .73 to .91. According to Garson (2008), .70 is often noted as the lower limit for an acceptable Cronbach's alpha coefficient for a set of items in social science research. Nunnelly (1978) also identified .70 as the level at which a scale may be considered internally consistent. Based on the resulting coefficients, the constructs found within Section I of the Missouri Agricultural Mechanics Assessment were deemed reliable.

Data Collection

A modified version of the Dillman (2007) Tailored Designed Method for Internet Surveys was utilized to guide the data collection process of this study. For this study, subjects were contacted up to six times through electronic mail from the researcher. Responses from participants were coded to facilitate a higher response rate. The first contact with respondents was a brief pre-notice e-mail message (Appendix G) sent three days prior to the beginning of the data collection period on October 26, 2009. In this e-mail, an overview of the research was provided and subjects were asked to participate in the study. Subjects were also given the opportunity to access the web-based questionnaire immediately using a URL link provided in the message. The e-mail also provided contact information for the researchers involved in the study and explained that participation in the study was voluntary, in accordance with University of Missouri IRB policies. Subjects were given the option of using a paper instrument, if preferred. No subjects selected this option. The second contact (Appendix H), occurred on October 29, 2009. In this e-mail message, subjects were provided a link to the web-based questionnaire, which included a detailed cover letter explaining the importance of their participation in the study. The third contact was made on November 2, 2009 in the form of an e-mail with an

URL link to a web-based replacement questionnaire that was sent to the non-respondents three days after the previous questionnaire mailing. This contact included a detailed cover letter (Appendix I), explaining the importance of a response and indicated that the person's completed questionnaire had not yet been received and urged the recipient to respond.

The fourth contact (Appendix J), with the respondents occurred three days after the third contact. On November 5, 2009, members of the population who had not yet responded were contacted via e-mail. The fact that there was an incentive enticement for participants, a chance to win a $100 Visa® Cash Card in a drawing, was highlighted in this message. They were encouraged to complete the questionnaire prior to the end of the data collection period, November 13, 2009, so that they might be included in the drawing for the gift card. At this time, respondents who had completed the questionnaire were extended a message of appreciation and were notified of the incentive. The fifth contact (Appendix K), was made with non-responding subjects. In this contact, a cover letter explaining the importance of their participation in the study and a URL link to the questionnaire were included. In this final e-mail, non-respondents were urged to complete the questionnaire.

Due to the follow-up options provided by Hosted Survey™, an additional e-mail was sent to respondents who began the instrument, but failed to complete it. Instrument features allowed these respondents to begin the instrument from where they last left off rather than requiring them to start over. Teachers who completed the entire instrument immediately were sent a confirmation e-mail thanking them for their participation and an explanation about how the incentive drawing would be carried out. Upon the conclusion of the data collection period, a response rate of a 78.99% (*n* = 203) was obtained.

Data Analysis

Data were analyzed using the Statistical Package for the Social Sciences® (SPSS) 17.0 for Windows and Microsoft Office Excel® 2007. Data analysis methods were selected as a result of determining the scales of measurement for the variables. In most cases, descriptive statistics including measures of central tendency and variability were calculated in order to "describe and summarize the data" (Ary, Jacobs, & Razavieh 2000, p. 154). An alpha level of .05 was set *a priori*.

Descriptive statistics were used to describe data associated with the characteristics of school-based agricultural educators in Missouri who instruct Agricultural Construction 1 and/ or Agricultural Construction 2. More specifically, frequency counts and percentages were used to adequately describe nominal and ordinal data. Measures of central tendency and variance, in relation to the demographic characteristics, were also calculated.

Descriptive statistics were used to describe data and to address the second research question. More specifically, frequency counts and percentages were used to adequately describe nominal and ordinal data. Descriptive statistics were reported to address the third research question, and analyze the demographic characteristics of school-based agriculture teachers in Missouri and their self-perceived levels of influence concerning the factors that influence the instruction of various agricultural mechanics curriculum found in the school-based agricultural education course entitled Agricultural Construction 1 and/or Agricultural Construction 2. More specifically, frequency counts and percentages were used to adequately describe nominal and ordinal data. Measures of central tendency and variance were calculated in relation to the characteristics of the respondents and their self-perceived responses to influential factors.

To determine if a relationship exist between and among teachers' choice to teach selected components of the Agricultural Construction 1 and/or Agricultural Construction 2 curriculum, the factors that influence teachers decision to teach selected components of the Agricultural Construction 1 and/or Agricultural Construction 2 curriculum, and their personal, professional, and program demographic characteristics (age, sex, years of teaching experience, university semester credit hours earned in agricultural mechanics, student enrollment in a school-based agricultural education program, type of teacher certification, and time spent supervising student SAE agricultural mechanics projects per week), descriptive statistics and simultaneous multiple linear regressions were utilized.

Summary of Findings

Research Question One

Research Question One sought to identify the personal, professional, and program characteristics of school-based agricultural educators in Missouri who teach Agricultural Construction 1 and/or Agricultural Construction 2. These teachers were predominately male (n = 169; 83.30%) and averaged 37 (M = 37.27) years of age. The highest number of respondents (*n* = 47; 23.15%) indicated that they teach within the Northeast Agricultural Education District. This group was followed by teachers who teach in the following agricultural education districts: Central (*n* = 42; 20.69%), (*n* = 41; 20.20%), Northwest (*n* = 27; 13.30%), South Central (*n* = 26; 12.81%), and finally the Southeast Agricultural Education District (n = 20; 9.85%). Participants also indicated that they had on average almost 13 years of teaching experience (*M* =12.66) and had an agricultural education program student enrollment of roughly 94 (*M* = 93.71) students.

A sizeable portion of the respondents (*n* = 85; 41.90%) graduated from the University of Missouri and had completed almost 11 (*M* = 10.71) university semester credit hours in agricultural mechanics coursework. Overwhelmingly, 91.10% (*n* = 185) of the respondents indicated that they possessed a traditional teacher certification; whereas, the remainder of teachers (*n* = 18; 8.90%) indicated that they became certified through alternative means. Finally, these teachers spent about 5 (*M* = 4.90) hours per week supervising student agricultural mechanics SAE projects.

This study sought to determine the contests related to agricultural mechanics in which students participate. Nearly 9 of 10 teachers (*n* = 179; 88.20%) indicated that their students participate in one or more contest related to agricultural mechanics. More than two-thirds of the teachers (*n* = 138; 68.00%) indicated that their students participated in the Missouri Agricultural Mechanics Career Development Event. This contest was followed by teachers who indicated student participation in county-level agricultural mechanics project shows (*n* = 131; 64.50%); district-level agricultural mechanics project shows (*n* = 91; 44.80%) the Missouri State Fair's FFA agricultural mechanics project show (*n* = 101; 49.80%), Skills USA Welding Contest (*n* = 20; 9.90%) and other agricultural mechanics contests (*n* = 10; 4.90%).

The study also sought to determine the level of preparation of school-based agricultural educators in Missouri who instruct Agricultural Construction 1 and/or Agricultural Construction 2. More than half (*n* = 106; 52.20%) of the respondents indicated that they did not feel prepared to teach school-based agricultural mechanics courses upon graduation from their undergraduate institution. Teachers who felt unprepared to teach school-based agricultural mechanics courses were also asked to rate their level of preparation when they graduated from their undergraduate institution. These teachers were offered the following scale to rate their level of preparation: 0 = no preparation; 1 = little preparation; 2 = some preparation; 3 = moderate preparation; and 4 = excellent preparation. The majority of teachers (*n* = 60; 56.60%) indicated that they had some preparation to teach agricultural mechanics, based upon their experience at their undergraduate university. The mean level of preparation, as indicated by the respondents, was 1.74, or some preparation.

Research Question Two

Research Question Two sought to identify the selected components of the Agricultural Construction 1 and/or Agricultural Construction 2 curriculum that school-based agricultural educators in Missouri instruct. The curriculum components that are included in this school-based agricultural education course include curriculum in the following areas: Arc Welding, Project Construction, Oxy-Gas and Other Cutting/Welding

Processes, Woodworking, Metals, and Finishing. Results from the study indicated that the majority of respondents instruct the following curriculum: Arc Welding (*n* = 172; 84.70%); Project Construction (*n* = 180; 88.70%); Oxy-Gas and Other Cutting/Welding Processes (*n* = 171; 84.20%); Woodworking (*n* = 124; 61.10%); Metals (*n* = 140; 69.00%), and Finishing (*n* = 143; 70.40%).

Research Question Three

Research Question Three sought to determine the factors that influence school-based agricultural educators in Missouri to teach selected curriculum components in Agricultural Construction 1 and Agricultural Construction 2. The curriculum components that are included in this school-based agricultural education course include curriculum in the following areas: Arc Welding, Project Construction, Oxy-Gas and Other Cutting/Welding Processes, Woodworking, Metals, and Finishing. The teachers rated ten influential factors (*Personal Importance, Personal Ability to Teach, Personal Interest in Teaching, Experience in Teaching, Equipment Available to Teach, Student Importance, Facilities Available to Teach, Community Importance, Budget Available to Teach, Administration Importance*) based upon their perceived level of influence (0 = no influence; 1 = little influence; 2 = some influence; 3 = moderate influence; 4 = great influence) to teach a certain curriculum component. Results of the influence of each factor were analyzed with the following scale: 0 to .50 = no influence, .51 to 1.50 = little influence, 1.51 to 2.50 = some influence, 2.51 to 3.50 = moderate influence, 3.51 to 4.00 = great influence.

For each of the curriculum components, the influential factor, Personal Importance, had the highest mean score. For the Arc Welding curriculum component, teachers indicated the influential factor, Personal Importance, had the highest mean (M = 3.50) for this curriculum component. The influential factor, Personal Importance, was also found to have the highest mean (M = 3.40) for the curriculum component Project Construction. Regarding the curriculum component Oxy-Gas and Other Cutting/ Welding Processes, the influential factor, Personal Importance, had the highest mean (M = 3.16). For the curriculum component Woodworking, teachers indicated that the influential factor Personal Importance, had the highest mean (M = 2.98) of all of the ten influential factors that influence their decision to teach the curriculum component. The fifth curriculum component was Metals. For this part of the curriculum, teachers indicated that the influential factor Personal Importance had the highest mean of 2.72. Finally, results of the study found that teachers indicated that the influential factor, Personal Importance, guided their decision the most to teach the Finishing curriculum. The mean for this influential factor was 2.86.

Research Question Four

Research Question Four sought to determine if a relationship existed between the summated influential variables Importance of Teaching (personal importance, student importance, community importance, and administrative importance), and Level of Teacher Self-Efficacy (personal ability to teach, personal interest in teaching, and experience in teaching) when compared to the curriculum areas (Arc Welding, Project

Construction, Oxy-Gas and Other Cutting/Welding Processes, Woodworking, Metals, and Finishing) found in the Missouri agricultural education course entitled Agricultural Construction 1 and/ or Agricultural Construction 2, and the characteristics (sex, age, average number of hours spent in a week supervising agricultural mechanics SAE projects, years of teaching experience, student enrollment in the agricultural education program, type of teaching certification, and university semester credit hours of agricultural mechanics coursework earned) of Missouri school-based agriculture teachers. A Simultaneous Multiple Linear Regression (SMLR) was used to determine if the independent variables (demographic characteristic) could explain either Importance of Teaching or Teacher Self-Efficacy (dependent variables) for each curriculum area.

Importance of teaching arc welding curriculum versus demographic characteristics.

To determine if the selected independent variables (sex, age, average number of hours spent in a week supervising agricultural mechanics SAE projects, years of teaching experience, student enrollment in the agricultural education program, type of teaching certification, and university semester credit hours of agricultural mechanics coursework earned) could explain the summated variable (Importance of Teaching) for each curriculum area (Arc Welding, Project Construction, Oxy-Gas and Other Cutting/Welding Processes, Woodworking, Metals, and Finishing) found with the agricultural education course Agricultural Construction 1 and/or Agricultural Construction 2, a Simultaneous Multiple Linear Regression (SMLR) was used. For the summated variable Importance of Teaching Arc Welding, no independent variables in the model were found significant in explaining the proportion of variance (R^2 = .03). However, for the summated variable Importance of Teaching Project Construction, three independent variables (average number of hours spent in a week supervising agricultural mechanics SAE projects, student enrollment in the agricultural education program, and university semester credit hours of agricultural mechanics coursework earned) in the model were found to be significant in explaining the proportion of variance (R^2 = .10).

Furthermore, results indicated that for the summated variable Importance of Teaching Oxy/Gas and Other Cutting/Welding Processes, only one independent variable (type of teaching certification) in the model was found to be significant in explaining the proportion of variance (R^2 = .05). For the summated variable Importance of Teaching Woodworking, no independent variables in the model were found to be significant in explaining the proportion of variance (R^2 = .04). In addition, the independent variable in the model, average number of hours spent in a week supervising agricultural mechanics SAE projects, was found to be significant in explaining the proportion of variance for the summated variable Importance of Teaching Metals (R^2 = .07). In conclusion, the proportion of variance found within the model for the summated variable Importance of Teaching Finishing, could not be explained by any of the independent variables (R^2 = .05).

Teacher self-efficacy of teaching curriculum versus demographic characteristics.

To determine if the selected independent variables (sex, age, average number of hours spent in a week supervising agricultural mechanics SAE projects, years of teaching experience, student enrollment in the agricultural education program, type of teaching certification, and university semester credit hours of agricultural mechanics coursework earned) could explain the summated variable (Teacher Self-Efficacy) for each curriculum area (Arc Welding, Project Construction, Oxy-Gas and Other Cutting/Welding Processes, Woodworking, Metals, and Finishing) found with the agricultural education course Agricultural Construction 1 and/or Agricultural Construction 2, a Simultaneous Multiple Linear Regression (SMLR) was used. For the summated variable Teacher Self-Efficacy to teach Arc Welding, three independent variables (sex, average number of hours spent in a week supervising agricultural mechanics SAE projects, and university semester credit hours of agricultural mechanics coursework earned) in the model were found significant in explaining the proportion of variance ($R^2 = .11$).The summated variable Teacher Self-Efficacy to teach Project Construction, could be explained by the two independent variables (average number of hours spent in a week supervising agricultural mechanics SAE projects and university semester credit hours of agricultural mechanics coursework earned) in the model were found to be significant in explaining the proportion of variance ($R^2 = .16$). Furthermore, results indicated that for the summated variable Teacher Self-Efficacy to teach Oxy/Gas and Other Cutting/Welding Processes, only one independent variable (university semester credit hours of agricultural mechanics coursework earned) in the model was found to be significant in explaining the proportion of variance ($R^2 =$

.06). For the summated variable Teacher Self-Efficacy to teach Woodworking, only one independent variable (university semester credit hours of agricultural mechanics coursework earned) in the model was found to be significant in explaining the proportion of variance (R^2 = .08). In addition, no independent variables in the model were found to be significant in explaining the proportion of variance for the summated variable Teacher Self-Efficacy to teach Metals (R^2 = .05). Finally, the proportion of variance found within the model for the summated variable Teacher Self-Efficacy to teach Finishing, could be explained by only one of the independent variables, average number of hours spent in a week supervising agricultural mechanics SAE projects (R^2 = .05).

Conclusions and Implications

The following conclusions, implications and recommendations are made as a result of the research questions found within this study. For Research Question One, an evaluation of personal, professional, and program characteristics were reported. Results of Research Question Two determined the self-reported curriculum areas taught within the agricultural education course Agricultural Construction 1 and/or Agricultural Construction 2 by school-based agriculture teachers in Missouri. Answers to Research Question Three identified the self-perceived factors that influence school-based agricultural educators in Missouri to instruct the curriculum components found with the agricultural education course entitled Agricultural Construction 1 and/or Agricultural Construction 2. Finally, results from Research Question Four identified the selected independent variables that can explain the summated variables for each curriculum area found with the agricultural education course Agricultural Construction 1 and/or Agricultural Construction 2. Conclusions and implications are drawn from the findings and then recommendations are offered. Recommendations include practical recommendations that can be implemented by teacher educators, school-based agriculture educators, and local, state, and national agricultural education advisory groups. Recommendations for further research in this area are offered as well.

Research Question One

Research Question One sought to describe the personal, professional, and program characteristics of school-based agricultural educators in Missouri who instruct the agricultural education course entitled Agricultural Construction 1 and/or Agricultural Construction 2. Based upon the results of this study, teachers who instruct Agricultural Construction 1 and/or Agricultural Construction 2, are male, 37 years old, and hold a traditional teaching certification. The typical teacher graduated with his undergraduate degree from the University of Missouri and earned almost 11 university semester credit hours in the area of agricultural mechanics. He feels his undergraduate institution did not adequately prepare him to teach agricultural mechanics at the secondary level.

These teachers have about 13 years of teaching experience, teach in the Northeast agricultural education district, and teach about 94 students per semester. Furthermore, as FFA advisors, these teachers spend about 5 hours per week supervising agricultural mechanics related SAE projects. Additionally, these teachers also supervise students who participate in agricultural mechanics related contests (Missouri Agricultural Mechanics CDE, agricultural mechanics project shows, etc.)

Research Question Two

Research Question Two sought to identify the selected components of the Agricultural Construction 1 and/or Agricultural Construction 2 curriculum that school-based agricultural educators in Missouri instruct. The curriculum components that are included in this school-based agricultural education course include curriculum in the following areas: Arc Welding, Project Construction, Oxy-Gas and Other Cutting/Welding, Woodworking, Metals, and Finishing. The majority of teachers indicated that they instruct all curriculum areas included in Agricultural Construction 1 and/or Agricultural Construction 2. However, these teachers teach the curriculum areas related to hot metal work, specifically Arc Welding, Project Construction, and Oxy-Gas and Other Cutting/Welding Processes, more than the curriculum areas related to woodworking, cold metal skills, and finishing.

Numerous questions are raised from these results. Why do teachers choose to teach certain curriculum areas over others? What factors influence these teachers' decisions concerning their choice to instruct curriculum? Why is curriculum related to hot metal skills instructed more than curriculum related to woodworking, metals (cold metal skills), and finishing in Agricultural Construction 1 and/or Agricultural Construction 2 courses?

Research Question Three

Research Question Three sought to determine the level of influence selected factors have upon a teacher's choice to instruct various curriculum components included in Agricultural Construction 1 and Agricultural Construction 2. For each curriculum area, specifically Arc Welding, Project Construction, Oxy-Gas and Other Cutting/Welding Processes, Woodworking, Metals, and Finishing, teachers indicated that the factor of Personal Importance was the most influential factor that persuaded them to instruct each curriculum area. Furthermore, the factor of Administration Importance was the least influential factor that persuaded these teachers to instruct each curriculum area. The remaining factors were distributed sporadically between the most influential factor and least influential factor, and thus, no measurable pattern was found.

The Theory of Planned Behavior (Ajzen, 1991) played a major role in the development of the theoretical foundation for this study. The results of this study can be applied to this theory and conceptually worked in reverse order (see Figure 7). If researchers can understand teachers' behavior (teach or not to teach the curriculum), future research can be conducted to determine their intention to teach. According to Ajzen (1991), a teachers intention to teach is based upon four influential factors: attitude toward teaching agricultural mechanics; the subjective norm, or the social pressures that the administration, the community, and the students themselves, place upon the teacher to instruct the curriculum; motivational factors, such as amount of personal effort, level of intention to teach, and non-motivational factors such as budget, personal skill level, equipment, facilities; and perceived behavioral control, or the extent to which teachers believe themselves to be capable of teaching curriculum which is assumed to reflect past experience as well as anticipated impediments and obstacles. As agricultural educators, if we can unlock these factors and ensure that new teachers have positive experiences, can we then determine if teachers will choose to teach agricultural mechanics curriculum? These questions and others are grounds for future research in this subject area.

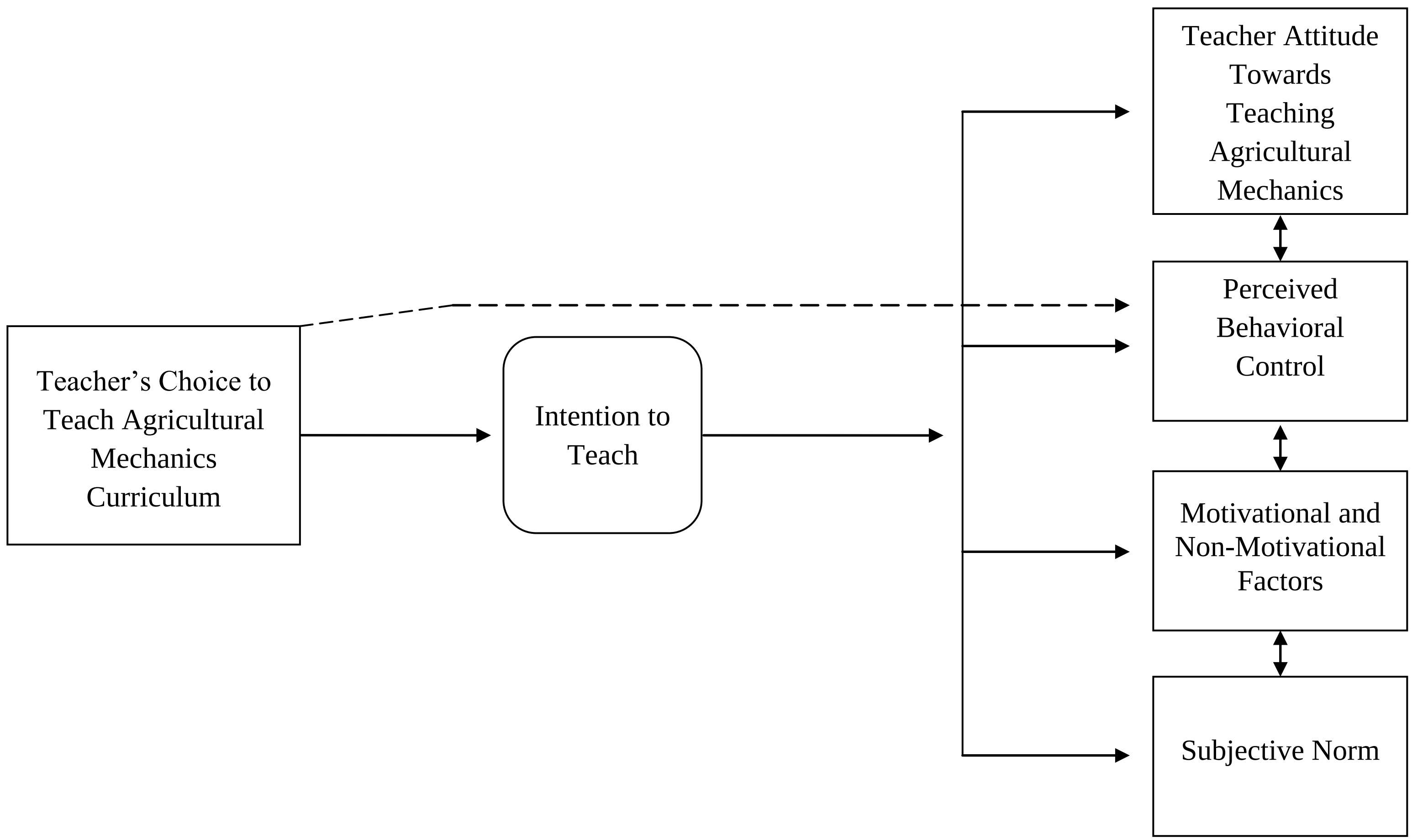

Figure 7. Conceptual Framework for Teachers' Choice to Instruct Agricultural Mechanics Curriculum (Saucier, 2010)

Several implications can be extrapolated from these results. Why does the factor, Personal Importance, play such a significant role in determining the curriculum that Missouri teachers instruct in Agricultural Construction 1 and/or Agricultural Construction 2? How is agriculture teacher's personal importance toward the instruction of agricultural mechanics curriculum developed? At what point during an agriculture teacher's career is their level of importance toward the instruction of agricultural mechanics curriculum developed? What factors attribute to the development of a teachers' level of importance toward the instruction of agricultural mechanics curriculum? Can a teacher's level of importance toward the instruction of agricultural mechanics curriculum be altered or improved? If so, what methods or opportunities have the potential to influence change in a teacher's level of importance toward the instruction of agricultural mechanics curriculum?

Another notable result of this study concerns the literature based factor Administration Importance. For every curriculum area found within the course Agricultural Construction 1 and/or Agricultural Construction 2, teachers indicated that Administration Importance was the least important factor that influenced their decision to teach the various curriculum areas. Why does the factor Administration Importance play such an insignificant role in determining the curriculum that school-based agricultural educators in Missouri teach in the course Agricultural Construction 1 and/or Agricultural Construction 2? Do teachers not care about the opinion of administrators when it pertains to the instruction of curriculum at their school? Or do administrators not have knowledge of the curriculum found within the course Agricultural Construction 1 and/or Agricultural

Construction 2? These questions and others are grounds for future research regarding curriculum choice in agricultural mechanics programs.

Research Question Four

Research Question Four sought to determine if a relationship existed between the summated influential variables Importance of Teaching, composed of personal importance, student importance, community importance, and administrative importance, and level of Teacher Self-Efficacy, composed of personal ability to teach, personal interest in teaching, and experience in teaching, when compared to the curriculum areas found in the Missouri agricultural education course entitled Agricultural Construction 1 and/ or Agricultural Construction 2, and the characteristics (sex, age, average number of hours spent in a week supervising agricultural mechanics SAE projects, years of teaching experience, student enrollment in the agricultural education program, type of teaching certification, and university semester credit hours of agricultural mechanics coursework earned) of Missouri school-based agriculture teachers.

For the summated variable Importance of Teaching, results of the study varied. Analysis of the data indicated that in the curriculum area of Project Construction, three independent variables, including average number of hours spent in a week supervising agricultural mechanics SAE projects, student enrollment in the agricultural education program, and university semester credit hours of agricultural mechanics coursework earned, in the model could explain the summated variable Importance of Teaching. For the curriculum area of Oxy-Gas and Other Cutting/Welding Processes, only one independent variable, type of teaching certification, in the model could explain the summated variable Importance of Teaching. In the curriculum area of Metals, the independent variable, average number of hours spent in a week supervising agricultural mechanics SAE projects, was found to be significant in explaining the summated variable Importance of Teaching. Furthermore, for the curriculum areas of Arc Welding, Woodworking, and Finishing, no independent variables in the model could explain the summated variable Importance of Teaching. In conclusion, no one independent variable could explain any of the models for Importance of Teaching regarding each curriculum area.

Regarding the summated variable Teacher Self-Efficacy, results of the study varied. Analysis of the data regarding the curriculum area of Arc Welding indicated that three independent variables (sex, average number of hours spent in a week supervising agricultural mechanics SAE projects, and university semester credit hours of agricultural mechanics coursework earned) in the model could explain the summated factors related to teacher self-efficacy. For the curriculum area of Project Construction, two independent variables (average number of hours spent in a week supervising agricultural mechanics SAE projects and university semester credit hours of agricultural mechanics coursework earned) in the model could explain the summated variable Teacher Self-Efficacy. In addition, two of the curriculum areas (Oxy/Gas and Other Cutting/Welding Processes & Woodworking) could be explained by the independent variable, university semester credit hours of agricultural mechanics coursework earned, in the model as it is related to the summated variable Teacher Self-Efficacy. No independent variables in the model could explain the summated variable, Teacher Self-Efficacy, regarding the curriculum area of Metals. Furthermore, the independent variable, average number of hours spent in a week supervising agricultural mechanics SAE projects, could explain the summated variable Teacher Self-Efficacy for the curriculum area of Finishing. In conclusion, no one independent variable could explain any of the models for Teacher Self-Efficacy regarding each curriculum area.

Several implications can be extrapolated from the results of this study. The independent variable, university semester credit hours of agricultural mechanics coursework earned, was a reoccurring selected teacher characteristic that was significant in explaining five of the twelve models for both summated variables, Importance of Teaching (Project Construction) and Teacher Self-Efficacy (Arc Welding, Project Construction, Oxy/Gas and Other Cutting/Welding Processes, & Woodworking). Does the amount of agricultural mechanics related coursework that teachers acquire in college influence the importance that they perceive toward teaching curriculum found within the course Agricultural Construction 1 and/or Agricultural Construction 2? Does the amount of agricultural mechanics related coursework that teachers acquire in college influence their self-efficacy level toward the instruction of curriculum found within the course Agricultural Construction 1 and/or Agricultural Construction 2? Can a teacher's perceived level of importance toward the instruction of agricultural mechanics curriculum be positively influenced by professional development education? If so, what methods or instructional techniques can change a teacher's perception toward the instruction of agricultural mechanics curriculum?

Furthermore, the independent variable, average number of hours spent in a week supervising agricultural mechanics SAE projects, was another reoccurring selected teacher characteristic that was significant in explaining five of the twelve models for both summated variables, Importance of Teaching (Project Construction & Metals) and Teacher Self-Efficacy (Arc Welding, Project Construction, & Finishing). Does the amount of time that teachers spend supervising agricultural mechanics related SAE projects influence the importance that they perceive toward teaching curriculum found within the course Agricultural Construction 1 and/or Agricultural Construction 2? Does the amount of time that teachers spend supervising agricultural mechanics related SAE projects influence their self-efficacy level toward the instruction of curriculum found within the course Agricultural Construction 1 and/or Agricultural Construction 2? Can a teacher's perceived level of importance toward the instruction of agricultural mechanics curriculum be positively influenced by professional development education? If so, what methods or instructional techniques can change a teacher's perception toward the instruction of agricultural mechanics curriculum? These questions and others are areas for future research regarding teacher perceptions of curriculum instruction and self-efficacy.

Recommendations

The following recommendations are made as a result of the examination of the Missouri school-based agricultural educators who instruct Agricultural Construction 1 and/or Agricultural Construction 2 and their perceptions of factors that influence their decision to teach the six curriculum areas. Recommendations include both practical recommendations which can be implemented by state supervisory staff, local and state professional development staff, and teacher educators within Missouri and recommendations for further research in this area.

Research Question One and Two

Research Question One sought to identify the personal, professional, and program characteristics of school-based agricultural educators in Missouri. Research Question Two sought to determine the curriculum taught by school-based agricultural educators in Missouri who instruct the agricultural education course Agricultural Construction 1 and/or Agricultural Construction 2. Based upon the results of this study, recommendations for future research are offered by the researcher.

According to the National Council for Agricultural Education, it is imperative that agriculture teacher education institutions from across the nation prepare fully qualified and highly motivated agricultural educators for school-based agricultural education programs (Osborne, 2007). According to the National Council for Agricultural Education:

> "Agriscience teacher recruitment and preparation are crucial to high-quality, school-based agricultural education programs. A strong relationship exists between teacher quality and program quality, and university teacher preparation programs must expand enrollments while continuing to graduate high qualified agriscience teacher candidates." (Osborne, 2007, p.20)

It is recommended by the researcher that teacher educators at each preparatory institution understand the curriculum that teachers are instructing at the local level. By understanding the curriculum areas that teachers instruct, and the curriculum areas that they do not instruct, teacher educators and state supervisory staff can develop timely and accurate professional development education opportunities for these teachers (Osborne, 2007). The researcher also recommends that future research efforts be conducted periodically, or every five years, to identify a profile of the school-based agricultural educators in Missouri and the curriculum that these teachers instruct to their students.

Research Question Three

Research Question Three sought to determine the self-perceived influence of ten factors on a teacher's decision to instruct the curriculum areas found in the agricultural education course Agricultural Construction 1 and/or Agricultural Construction. Based upon the results of this study, recommendations for future research are offered by the researcher.

According to the results of this study, school-based agricultural educators in Missouri who instruct Agricultural Construction 1 and/or Agricultural Construction 2, identified the factor *Teacher Importance*, as the most influential factor that persuaded their decision to teach, or not teach, each of the six curriculum areas found within this course. If *Teacher Importance* is the main driving force behind the instruction of curriculum, then as teacher educators, how can we change teacher opinion towards curriculum so that all aspects of the Agricultural Construction 1 and/or Agricultural

Construction 2 curriculum are taught to school-based students who are enrolled in this course? Furthermore, when do teachers form their opinions regarding agricultural mechanics curriculum? Do teachers instruct agricultural mechanics curriculum areas that they feel comfortable teaching? Or is *Teacher Importance* toward agricultural mechanics curriculum areas stimulated by previous knowledge, or the lack there of? Answers to these questions and others should be studied in the future.

According to Burris, Robinson, and Terry (2005), teacher educators from across the nation identified agricultural mechanics as a vital part of many school-based agricultural programs by teacher educators and indicated that the agricultural education program graduates in their programs lacked knowledge in the area of agricultural mechanics. Recommendations by Burris, Robinson, and Terry suggested that teacher educators must continue to include agricultural mechanics in their teacher preparation programs and that pre-service teachers would benefit from a wide range of agricultural mechanics content areas. Hubert and Leising (2000) found that for agriculture teachers to do the best job possible teaching agricultural mechanics; they need to receive current and reliable pre-service agricultural mechanics instruction. Future research should include studies designed to determine the amount and variety of agricultural mechanics education that pre-service teachers need prior to graduation, the technical knowledge and skill competencies that these pre-service teachers should know prior to teaching, and the laboratory management pedagogy that these pre-service teachers require.

Several recent studies regarding agricultural mechanics curriculum (McKim, Saucier, & Reynolds, 2010; Saucier, Terry, & Schumacher, 2009; Saucier, Tummons, Terry, & Schumacher, 2010) have recommended that professional development education be provided for teachers who lack technical and skill competence in the area of agricultural mechanics. If *Teacher Importance* towards agricultural mechanics curriculum is influenced by a lack of personal experience, technical knowledge, or skill development, then as teacher educators, should we provide professional development opportunities for these teachers?

According to the National Council for Agricultural Education (Osborne, 2007), the answer is yes. They stated that existing teachers should have continuing access to high quality professional development programs. Furthermore, teachers should be “fully qualified” to instruct students at school-based agricultural education programs (Osborne, 2007, p. 20). If the goal of teacher educators and state professional development staff is to aid in this effort and provide professional development programs in the curriculum area of agricultural mechanics, recommendations from research (Knowles, 1980; Park, Moore, & Rivera, 2007) should be acknowledged concerning the development and implementation of professional development programs for these teachers.

Park, Moore, and Rivera (2007) found that teachers, who gain the most from professional development programs, felt engaged, set their own learning expectations, became interested, and asserted themselves toward changing their teaching practices. These findings are aligned with the Theory of Andragogy (Knowles, 1980). Knowles theory states that adults need to know why they need to learn something and become more motivated to learn when they see the need to learn. The theory further states that adults learn experientially, learn as problem solvers, and learn best when the topic is of immediate value to them. Knowles’ additionally found that adults should be engaged in the planning of their own learning experiences.

Recommendations for teacher educators and state professional development staff in Missouri include the continual evaluation of school-based agriculture teachers professional development needs in the areas of agricultural mechanics. This can be accomplished by periodic research and personal feedback from teachers in the field. Professional development education opportunities should reflect teachers' immediate need regarding the instruction of agricultural mechanics course curriculum in Missouri and perpetuate, based upon increases in technology, into a variety of diverse areas that benefit students.

Results from the study also indicated that the literature based factor, *Administration Importance*, was the least important factor that influenced school-based agriculture teachers in Missouri to teach agricultural mechanics curriculum. Several questions have surfaced regarding this finding. Why does the importance that a school administrator expresses towards a teachers' curriculum choice have such little influence on the teachers' decision? Are school administrators in Missouri conscious of the agricultural mechanics curriculum? Research should be conducted to determine the knowledge that school administrators in Missouri have regarding agricultural mechanics curriculum and the perceived value that administrators place on agricultural mechanics curriculum. This research could help determine why administrators' importance level towards agricultural mechanics curriculum choice is so devalued by school-based agricultural educators in Missouri.

Research Question Four

Research Question Four sought to determine the selected characteristics of teachers that could explain the summated variables Importance of Teaching and Teacher Self-Efficacy for each curriculum area found within the agricultural education course Agricultural Construction 1 and/or Agricultural Construction 2. Based upon the results of this study, recommendations for future research are offered by the researcher.

Results of the study indicated that the independent variables, university semester credit hours of agricultural mechanics coursework earned and average number of hours spent in a week supervising agricultural mechanics SAE projects, could aid in the explanation of the summated variables Importance of Teaching and Teacher Self-Efficacy of the six curriculum areas found with the course Agricultural Construction 1 and/or Agricultural Construction 2. However, not all independent variables could explain the model for the summated variable Importance of Teaching for the instruction of the curriculum areas of Woodworking and Finishing. This was also the case with the summated variable Teacher Self-Efficacy for the instruction of the curriculum area of Metals. What other teacher characteristics (independent variables) can explain these summated variables in these various curriculum areas? Research should be conducted to expand these teacher characteristics and determine if they aid in the explanation of why teachers choose to teach various curriculum areas in the Agricultural Construction 1 and/or Agricultural Construction 2 course.

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APPENDICES

APPENDIX A

MISSOURI AGRICULTURAL MECHANICS ASSESSMENT


Missouri Agricultural Mechanics Assessment
The purpose of this study is to determine the curriculum competencies that Missouri agriculture teachers instruct in Agricultural Construction I & II and the factors that influence these teachers to instruct various Agricultural Construction I & II course curriculum topics. The results of this study could influence the future education of new Missouri agriculture teachers and the continued professional development education of existing Missouri agriculture teachers.
Please read each question carefully and answer each question by selecting the response choice that best represents your feelings toward the question.
If you need assistance or have questions while taking this survey, please contact:
Mr. Ryan Saucier
ryan@teachagriculturaleducation.org
573-882-2200 or 936-581-3457
Begin Survey
Powered By Hostedware

Missouri Agricultural Mechanics Assessment

Respondent ID: 1212
Name: AgricultureTeacher, Missouri
Company:
E-mail: prsnq5@mail.missouri.edu

Arc Welding

PROGRESS:

The "Arc Welding" section of the Agricultural Construction I & II curriculum contains the following skill competencies:

1. List safety procedures for arc welding.
2. Identify the various types of metals and their properties.
3. Prepare metals for welding: cutting, grinding, and/or cleaning.
4. Weld in all positions with stick welder. (Shielded Metal Arc Welding)
5. Weld in all positions with MIG welder. (Gas Metal Arc Welding)
6. Hardsurface areas where extensive wear may occur.
7. Weld cast iron pipe.
8. Weld pipe.

Do you teach all or part of the "Arc Welding" curriculum in Agricultural Construction I & II? (Please choose one)

○ Yes
○ No

Submit

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Missouri Agricultural Mechanics Assessment

Respondent ID: 1212
Name: AgricultureTeacher, Missouri
Company:
E-mail: prsnq5@mail.missouri.edu

Please rate each factor regarding its influence upon your decision to teach "Arc Welding" in Agricultural Construction I & II.

	No Influence	Little Influence	Some Influence	Moderate Influence	Great Influence
The importance that you place on teaching "Arc Welding" to students.	○	○	○	○	○
The importance that the community places on teaching "Arc Welding" to students.	○	○	○	○	○
The importance that students place on being taught "Arc Welding."	○	○	○	○	○
The importance that the administration places on teaching "Arc Welding" to students.	○	○	○	○	○
Your ability to teach "Arc Welding" to students.	○	○	○	○	○
Your personal interest in teaching "Arc Welding" to students.	○	○	○	○	○
Your experience in teaching "Arc Welding" to students.	○	○	○	○	○
Facilities (e.g. shop size, welding booths, etc.) available to teach "Arc Welding" to students.	○	○	○	○	○
Equipment (e.g. welding machines, supplies, etc.) available to teach "Arc Welding" to students.	○	○	○	○	○
Budget available for teaching "Arc Welding."	○	○	○	○	○

How many days per school year do you devote to teaching "Arc Welding?"

Submit

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Missouri Agricultural Mechanics Assessment

Respondent ID: 1212
Name: AgricultureTeacher, Missouri
Company:
E-mail: prsnq5@mail.missouri.edu

Please rate each factor regarding its influence upon your decision to not teach "Arc Welding" in Agricultural Construction I & II.

	No Influence	Little Influence	Some Influence	Moderate Influence	Great Influence
The importance that you place on teaching "Arc Welding" to students.	○	○	○	○	○
The importance that the community places on teaching "Arc Welding" to students.	○	○	○	○	○
The importance that students place on being taught "Arc Welding."	○	○	○	○	○
The importance that the administration places on teaching "Arc Welding" to students.	○	○	○	○	○
Your ability to teach "Arc Welding."	○	○	○	○	○
Your personal interest in teaching "Arc Welding."	○	○	○	○	○
Your experience in teaching "Arc Welding."	○	○	○	○	○
Facilities available to teach "Arc Welding."	○	○	○	○	○
Equipment available to teach "Arc Welding."	○	○	○	○	○
Budget available for teaching "Arc Welding."	○	○	○	○	○

Submit

Finish Later

Missouri Agricultural Mechanics Assessment

Respondent ID: 1212
Name: AgricultureTeacher, Missouri
Company:
E-mail: prsnq5@mail.missouri.edu

Project Construction

PROGRESS:

The "Project Construction" section of the Agricultural Construction I & II curriculum contains the following skill competencies:

1. List the safety procedures for project construction.
2. Select and design a project plan.
3. List tools needed to complete a project and list safety precautions.
4. Develop a bill of materials and projected cost list.
5. Determine a time frame for completion of a project.
6. Interpret the project construction plan.
7. Lay out and prepare materials for cutting.
8. Determine construction design for proper hitching and balancing.
9. Determine construction design for legal specifications: width, length, weight, etc.
10. Identify and correct project defects by approved methods.
11. Perform assembly procedures.
12. Describe why a project should have a finish.
13. Determine actual costs of materials and labor for projects.
14. Hand and power tools used in completing this project.

Do you teach all or part of the "Project Construction" curriculum in Agricultural Construction I & II? (Please choose one)

○ Yes
○ No

Submit

Finish Later

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Missouri Agricultural Mechanics Assessment

Respondent ID: 1212
Name: AgricultureTeacher, Missouri
Company:
E-mail: prsnq5@mail.missouri.edu

Please rate each factor regarding its influence upon your decision to teach "Project Construction."

	No Influence	Little Influence	Some Influence	Moderate Influence	Great Influence
The importance that you place on teaching "Project Construction" to students.	○	○	○	○	○
The importance that the community places on teaching "Project Construction" to students.	○	○	○	○	○
The importance that students place on being taught "Project Construction."	○	○	○	○	○
The importance that the administration places on teaching "Project Construction" to students.	○	○	○	○	○
Your ability to teach "Project Construction."	○	○	○	○	○
Your personal interest in teaching "Project Construction."	○	○	○	○	○
Your experience in teaching "Project Construction."	○	○	○	○	○
Facilities available to teach "Project Construction."	○	○	○	○	○
Equipment available to teach "Project Construction."	○	○	○	○	○
Budget available for teaching "Project Construction."	○	○	○	○	○

How many days per school year do you teach "Project Construction?"

Submit

Finish Later

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Missouri Agricultural Mechanics Assessment

Respondent ID: 1212
Name: AgricultureTeacher, Missouri
Company:
E-mail: prsnq5@mail.missouri.edu

Please rate each factor regarding its influence upon your decision to not teach "Project Construction."

	No Influence	Little Influence	Some Influence	Moderate Influence	Great Influence
The importance that you place on teaching "Project Construction" to students.	○	○	○	○	○
The importance that the community places on teaching "Project Construction" to students	○	○	○	○	○
The importance that the students place on being taught "Project Construction."	○	○	○	○	○
The importance that the administration places on teaching "Project Construction" to students.	○	○	○	○	○
Your ability to teach "Project Construction."	○	○	○	○	○
Your personal interest in teaching "Project Construction."	○	○	○	○	○
Your experience in teaching "Project Construction."	○	○	○	○	○
Facilities available to teach "Project Construction."	○	○	○	○	○
Equipment available to teach "Project Construction."	○	○	○	○	○
Budget available for teaching "Project Construction."	○	○	○	○	○

Submit

Finish Later

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Missouri Agricultural Mechanics Assessment

Respondent ID: 1212
Name: AgricultureTeacher, Missouri
Company:
E-mail: prsnq5@mail.missouri.edu

Oxy-Gas and Other Cutting/Welding Processes

PROGRESS:

The "Oxy-Gas and Other Cutting/Welding Processes" section of the Agricultural Construction I & II curriculum contains the following skill competencies:

1. List the safety procedures required for using the oxy-acetylene equipment.
2. Perform in order the complete procedure for lighting, adjusting the flame, and shutdown of the torch.
3. Weld in all positions with oxy-gas welder.
4. Perform a hardsurfacing operation.
5. Weld cast iron using rod and flux.
6. Perform a braze weld operation.
7. Perform cutting with oxy-gas.
8. Perform cutting with arc-air.
9. Cut using the motorized torch.
10. Select appropriate tip for the job to be performed.

Do you teach all or part of the "Oxy-Gas and Other Cutting/Welding Processes" curriculum in Agricultural Construction I & II? (Please choose one)

○ Yes
○ No

Submit

Finish Later

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Missouri Agricultural Mechanics Assessment

Respondent ID: 1212
Name: AgricultureTeacher, Missouri
Company:
E-mail: prsnq5@mail.missouri.edu

Please rate each factor regarding its influence upon your decision to teach "Oxy-Gas and Other Cutting/Welding Processes".

	No Influence	Little Influence	Some Influence	Moderate Influence	Great Influence
The importance you place on teaching "Oxy-Gas and Other Cutting/Welding Processes" to students.	○	○	○	○	○
The importance that the community places on teaching "Oxy-Gas and Other Cutting/Welding Processes" to students.	○	○	○	○	○
The importance that students place on teaching "Oxy-Gas and Other Cutting/Welding Processes."	○	○	○	○	○
The importance that the administration places on teaching "Oxy-Gas and Other Cutting/Welding Processes" to students.	○	○	○	○	○
Your ability to teach "Oxy-Gas and Other Cutting/Welding Processes."	○	○	○	○	○
Your personal interest in teaching "Oxy-Gas and Other Cutting/Welding Processes."	○	○	○	○	○
Your experience in teaching "Oxy-Gas and Other Cutting/Welding Processes."	○	○	○	○	○
Facilities available to teach "Oxy-Gas and Other Cutting/Welding Processes."	○	○	○	○	○
Equipment available to teach "Oxy-Gas and Other Cutting/Welding Processes."	○	○	○	○	○
Budget available for teaching "Oxy-Gas and Other Cutting/Welding Processes."	○	○	○	○	○

How many days per school year do you teach "Oxy-Gas and Other Cutting/Welding Processes?"

Submit

Finish Later

Missouri Agricultural Mechanics Assessment

Respondent ID: 1212
Name: AgricultureTeacher, Missouri
Company:
E-mail: prsnq5@mail.missouri.edu

Please rate each factor regarding its influence upon your decision to not teach "Oxy-Gas and Other Cutting/Welding Processes."

	No Influence	Little Influence	Some Influence	Moderate Influence	Great Influence
The importance that you place on teaching "Oxy-Gas and Other Cutting/Welding Processes" to students.	○	○	○	○	○
The importance that the community places on teaching "Oxy-Gas and Other Cutting/Welding Processes" to students.	○	○	○	○	○
The importance that students place on being taught "Oxy-Gas and Other Cutting/Welding Processes."	○	○	○	○	○
The importance that the administration places on teaching "Oxy-Gas and Other Cutting/Welding Processes" to students.	○	○	○	○	○
Your ability to teach "Oxy-Gas and Other Cutting/Welding Processes."	○	○	○	○	○
Your personal interest in teaching "Oxy-Gas and Other Cutting/Welding Processes."	○	○	○	○	○
Your experience in teaching "Oxy-Gas and Other Cutting/Welding Processes."	○	○	○	○	○
Facilities available to teach "Oxy-Gas and Other Cutting/Welding Processes."	○	○	○	○	○
Equipment available to teach "Oxy-Gas and Other Cutting/Welding Processes."	○	○	○	○	○
Budget available for teaching "Oxy-Gas and Other Cutting/Welding Processes."	○	○	○	○	○

Submit

Finish Later

Missouri Agricultural Mechanics Assessment

Respondent ID: 1212
Name: AgricultureTeacher, Missouri
Company:
E-mail: prsnq5@mail.missouri.edu

Woodworking

PROGRESS:

The "Woodworking" section of the Agricultural Construction I & II curriculum contains the following skill competencies:

1. Identify common woods used in agricultural construction.
2. Select the proper fastener for a specific job.
3. List the actual and nominal dimensions of common construction lumber.
4. Use hand woodworking tools.
5. Use power woodworking tools.
6. Select preservatives.

Do you teach all or part of the "Woodworking" curriculum in Agricultural Construction I & II? (Please choose one)

- Yes
- No

Submit

Finish Later

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Missouri Agricultural Mechanics Assessment

Respondent ID: 1212
Name: AgricultureTeacher, Missouri
Company:
E-mail: prsnq5@mail.missouri.edu

Please rate each factor regarding its influence upon your decision to teach "Woodworking."

	No Influence	Little Influence	Some Influence	Moderate Influence	Great Influence
The importance that you place on teaching "Woodworking" to students.	○	○	○	○	○
The importance that the community places on teaching "Woodworking" to students.	○	○	○	○	○
The importance that students place on being taught "Woodworking."	○	○	○	○	○
The importance that the administration places on teaching "Woodworking" to students.	○	○	○	○	○
Your ability to teach "Woodworking."	○	○	○	○	○
Your personal interest in teaching "Woodworking."	○	○	○	○	○
Your experience in teaching "Woodworking."	○	○	○	○	○
Facilities available to teach "Woodworking."	○	○	○	○	○
Equipment available to teach "Woodworking."	○	○	○	○	○
Budget available for teaching "Woodworking."	○	○	○	○	○

How many days per school year do you teach "Woodworking?"

Submit

Finish Later

Missouri Agricultural Mechanics Assessment

Respondent ID: 1212
Name: AgricultureTeacher, Missouri
Company:
E-mail: prsnq5@mail.missouri.edu

Please rate each factor regarding its influence upon your decision to not teach "Woodworking."

	No Influence	Little Influence	Some Influence	Moderate Influence	Great Influence
The importance that you place on teaching "Woodworking" to students.	○	○	○	○	○
The importance that the community places on teaching "Woodworking" to students.	○	○	○	○	○
The importance that the students place on being taught "Woodworking."	○	○	○	○	○
The importance that the administration places on teaching "Woodworking" to students.	○	○	○	○	○
Your ability to teach "Woodworking."	○	○	○	○	○
Your personal interest in teaching "Woodworking."	○	○	○	○	○
Your experience in teaching "Woodworking."	○	○	○	○	○
Facilities available to teach "Woodworking."	○	○	○	○	○
Equipment available to teach "Woodworking."	○	○	○	○	○
Budget available for teaching "Woodworking."	○	○	○	○	○

Submit

Finish Later

Missouri Agricultural Mechanics Assessment

Respondent ID: 1212
Name: AgricultureTeacher, Missouri
Company:
E-mail: prsnq5@mail.missouri.edu

Metals

PROGRESS:

The "Metals" section of the Agricultural Construction I & II curriculum contains the following skill competencies:

1. Select metals by design and strength.
2. Explain how construction metal is dimensioned.
3. Remove stress risers.
4. Identify common metal fasteners.
5. Identify the hardness grade of a bolt.
6. Control heat distortion of metals.
7. Assemble work using proper locks and fasteners.
8. Use heat to shape metals.
9. Use tap and die set to do threading.
10. List steps used in tempering, annealing, hardening, wrinkle bending, normalizing, and welding to control crystallization.

Do you teach all or part of the "Metals" in Agricultural Construction I & II? (Please choose one)

○ Yes
○ No

Submit

Finish Later

Powered By Hostedware

Missouri Agricultural Mechanics Assessment

Respondent ID: 1212
Name: AgricultureTeacher, Missouri
Company:
E-mail: prsnq5@mail.missouri.edu

Please rate each factor regarding its influence upon your decision to teach "Metals."

	No Influence	Little Influence	Some Influence	Moderate Influence	Great Influence
The importance that you place on teaching "Metals" to students.	○	○	○	○	○
The importance that the community places on teaching "Metals" to students.	○	○	○	○	○
The importance that students place on being taught "Metals."	○	○	○	○	○
The importance that the administration places on teaching "Metals" to students.	○	○	○	○	○
Your ability to teach "Metals."	○	○	○	○	○
Your personal interest in teaching "Metals."	○	○	○	○	○
Your experience in teaching "Metals."	○	○	○	○	○
Facilties available to teach "Metals."	○	○	○	○	○
Equipment available to teach "Metals."	○	○	○	○	○
Budget available for teaching "Metals."	○	○	○	○	○

How many days per school year do you teach "Metals?"

Submit

Finish Later

Powered By Hostedware

Missouri Agricultural Mechanics Assessment

Respondent ID: 1212
Name: AgricultureTeacher, Missouri
Company:
E-mail: prsnq5@mail.missouri.edu

Please rate each factor regarding its influence upon your decision to not teach "Metals."

	No Influence	Little Influence	Some Influence	Moderate Influence	Great Influence
The importance that you place on teaching "Metals" to students.	○	○	○	○	○
The importance that the community places on teaching "Metals" to students.	○	○	○	○	○
The importance that students place on being taught "Metals."	○	○	○	○	○
The importance that the administration places on teaching "Metals" to students.	○	○	○	○	○
Your ability to teach "Metals."	○	○	○	○	○
Your personal interest in teaching "Metals."	○	○	○	○	○
Your experience in teaching "Metals."	○	○	○	○	○
Facilities available to teach "Metals."	○	○	○	○	○
Equipment available to teach "Metals."	○	○	○	○	○
Budget available for teaching "Metals."	○	○	○	○	○

Submit

Finish Later

Missouri Agricultural Mechanics Assessment

Respondent ID: 1212
Name: AgricultureTeacher, Missouri
Company:
E-mail: prsnq5@mail.missouri.edu

Finishing

PROGRESS:

The "Finishing" section of the Agricultural Construction I & II curriculum contains the following skill competencies:

1. Prepare surfaces for finishing.
2. Select the primer to use before painting the surface.
3. Select the paint to use in the finish operation.
4. List the steps for cleanup after finishing operation is complete.

Do you teach all or part of the "Finishing" curriculum in Agricultural Construction I & II? (Please choose one)

- ○ Yes
- ○ No

Submit

Finish Later

Powered By Hostedware

Missouri Agricultural Mechanics Assessment

Respondent ID: 1212
Name: AgricultureTeacher, Missouri
Company:
E-mail: prsnq5@mail.missouri.edu

Please rate each factor regarding its influence upon your decision to teach "Finishing."

	No Influence	Little Influence	Some Influence	Moderate Influence	Great Influence
The importance that you place on teaching "Finishing" to students.	○	○	○	○	○
The importance that the community places on teaching "Finishing" to students.	○	○	○	○	○
The importance that students place on being taught "Finishing."	○	○	○	○	○
The importance that the administration places on teaching "Finishing" to students.	○	○	○	○	○
Your ability to teach "Finishing."	○	○	○	○	○
Your personal interest in teaching "Finishing."	○	○	○	○	○
Your experience in teaching "Finishing."	○	○	○	○	○
Facilities available to teach "Finishing."	○	○	○	○	○
Equipment available to teach "Finishing."	○	○	○	○	○
Budget available for teaching "Finishing."	○	○	○	○	○

How many days per school year do you teach "Finishing?"

Submit

Finish Later

Powered By Hostedware

Missouri Agricultural Mechanics Assessment

Respondent ID: 1212
Name: AgricultureTeacher, Missouri
Company:
E-mail: prsnq5@mail.missouri.edu

Please rate each factor regarding its influence upon your decison to not teach "Finishing."

	No Influence	Little Influence	Some Influence	Moderate Influence	Great Influence
The importance that you place on teaching "Finishing" to students.	○	○	○	○	○
The importance that the community places on teaching "Finishing" to students.	○	○	○	○	○
The importance that students place on being taught "Finishing."	○	○	○	○	○
The importance that the administration places on teaching "Finishing" to students.	○	○	○	○	○
Your ability to teach "Finishing."	○	○	○	○	○
Your personal interest in teaching "Finishing."	○	○	○	○	○
Your experience in teaching "Finishing."	○	○	○	○	○
Facilties available to teach "Finishing."	○	○	○	○	○
Equipment available to teach "Finishing."	○	○	○	○	○
Budget available for teaching "Finishing."	○	○	○	○	○

Submit

Finish Later

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Missouri Agricultural Mechanics Assessment

Respondent ID: 1212
Name: AgricultureTeacher, Missouri
Company:
E-mail: prsnq5@mail.missouri.edu

Personal, Professional, and Program Information

PROGRESS:

What is your sex?

- Male
- Female

What is your age?

How many agricultural mechanics semester credit hours have you completed at the university level? (Please type the number of semester credit hours in the space provided)

How many years have you taught agricultural education at the secondary level?

Submit

Finish Later

Powered By Hostedware

Missouri Agricultural Mechanics Assessment

Respondent ID: 1212
Name: AgricultureTeacher, Missouri
Company:
E-mail: prsnq5@mail.missouri.edu

Personal, Professional, and Program Information

PROGRESS:

At what university did you complete your bachelor's degree?

- ○ College of the Ozarks
- ○ Missouri State University
- ○ Northwest State University
- ○ University of Central Missouri
- ○ University of Missouri
- ○ Other

Submit

Finish Later

Powered By Hostedware

Missouri Agricultural Mechanics Assessment

Respondent ID: 1212
Name: AgricultureTeacher, Missouri
Company:
E-mail: prsnq5@mail.missouri.edu

If you completed your bachelor's degree from a school that was not listed, please type the name of the university in which you recieved your bachelors' degree from.

Do you feel that your undergraduate university adequately prepared you to teach agricultural mechanics courses?

○ Yes
○ No

Submit

Finish Later

Powered By Hostedware

Missouri Agricultural Mechanics Assessment

Respondent ID: 1212
Name: AgricultureTeacher, Missouri
Company:
E-mail: prsnq5@mail.missouri.edu

What type of teacher certification do you possess? (Please check one)

- ○ Alternative teacher certification
- ○ Emergency teacher certification
- ○ Traditional teacher certification

What is the current student enrollment of the agricultural education program at the school in which you teach?

How many hours per week, on average, do you spend supervising agricultural mechanics SAE projects?

Submit

Finish Later

Powered By Hostedware

Missouri Agricultural Mechanics Assessment

Respondent ID: 1212
Name: AgricultureTeacher, Missouri
Company:
E-mail: prsnq5@mail.missouri.edu

If you did not feel that your undergraduate university adequately prepared you to teach agricultural mechanics courses, then please rate the level of preparation that you received.

	No Preparation	Little Preparation	Some Preparation	Moderate Preparation	Excellent Preparation
Level of preparation to teach agricultural mechanics courses	○	○	○	○	○

What type of teacher certification do you possess? (Please check one)

○ Alternative teacher certification
○ Emergency teacher certification
○ Traditional teacher certification

What is the current student enrollment of the agricultural education program at the school in which you teach?

How many hours per week, on average, do you spend supervising agricultural mechanics SAE projects?

Submit

Finish Later

Powered By Hostedware

Missouri Agricultural Mechanics Assessment

Respondent ID: 1212
Name: AgricultureTeacher, Missouri
Company:
E-mail: prsnq5@mail.missouri.edu

Personal, Professional, and Program Information

PROGRESS:

In what agricultural mechanics events do your students participate in?

- ☐ County-level agricultural mechanics project show
- ☐ District-level agricultural mechanics project show
- ☐ State Fair of Missouri agricultural mechanics project show
- ☐ Agricultural Mechanics Career Development Event (CDE)
- ☐ Skills USA welding contest
- ☐ Other
- ☐ None

Submit

Finish Later

Powered By Hostedware

Missouri Agricultural Mechanics Assessment

Respondent ID: 1212
Name: AgricultureTeacher, Missouri
Company:
E-mail: prsnq5@mail.missouri.edu

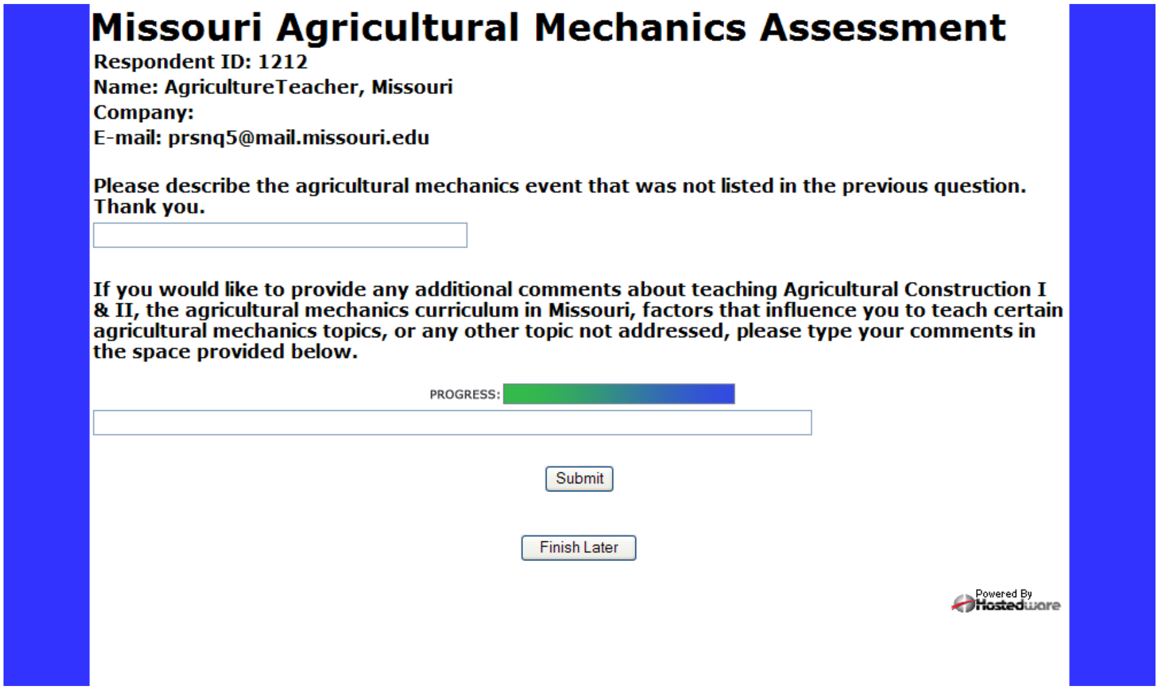
If you would like to provide any additional comments about teaching Agricultural Construction I & II, the agricultural mechanics curriculum in Missouri, factors that influence you to teach certain agricultural mechanics topics, or any other topic not addressed, please type your comments in the space provided below.

PROGRESS:

Submit

Finish Later

Powered By Hostedware



Missouri Agricultural Mechanics Assessment

Respondent ID: 1212
Name: AgricultureTeacher, Missouri
Company:
E-mail: prsnq5@mail.missouri.edu

Please describe the agricultural mechanics event that was not listed in the previous question. Thank you.

If you would like to provide any additional comments about teaching Agricultural Construction I & II, the agricultural mechanics curriculum in Missouri, factors that influence you to teach certain agricultural mechanics topics, or any other topic not addressed, please type your comments in the space provided below.

PROGRESS:

Submit

Finish Later

Powered By Hostedware

APPENDIX B

PANEL OF EXPERTS

PANEL MEMBERS

Name	University	Specialty Area
Mr. William Bird	University of Missouri	Agricultural Education and Agricultural Mechanics
Dr. Bryan Garton	University of Missouri	Agricultural Education
Dr. Jason Scales	University of Central Missouri	Agricultural Education and Agricultural Mechanics
Dr. Leon Schumacher	University of Missouri	Agricultural Mechanics
Dr. Robert Terry, Jr.	University of Missouri	Agricultural Education
Dr. Robert Torres	University of Missouri	Agricultural Education, Research Methodology, and Statistical Analysis
Mr. John Tummons	University of Missouri	Agricultural Education and Agricultural Mechanics
Mr. Stacy Vincent	University of Missouri	Agricultural Education

APPENDIX C

LETTER TO PANEL MEMBERS

University of Missouri
College of Agriculture, Food and Natural Resources
Departments of Agricultural Education/Agricultural Systems Management
125 A Gentry Hall, Columbia, MO 65211

Dear Panel Member: September 20, 2009

Greetings. My name is Ryan Saucier. I am a Ph.D. student at the University of Missouri pursuing a degree in Agricultural Education with emphasis in Agricultural Systems Management. I am currently conducting research for my dissertation that will seek to determine the influence of various factors that persuade agriculture teachers' decisions to teach certain aspects of the Agricultural Construction I & II curriculum in Missouri.

I am formally requesting your assistance in determining my instrument's validity. I realize that it is a very busy time of year for you; however, I hope that you will be able to assist me with this matter. Due to your extensive knowledge and expertise in the field of agricultural education, I have selected you to serve as one of the members of my "panel of experts." Your knowledge and time is very valuable to me.

Specifically, I would appreciate your feedback regarding both the ***face*** and ***content validity*** of the instrument that I have attached. I have also attached a copy of my purpose and objectives, my research questions, and the Agricultural Construction I & II curriculum competencies to guide you through your review of my instrument. Please feel free to comment on word choice and the ambiguity of the questions. If there are items or topics you do not see reflected in the instrument, but believe should be, please feel free to add them.

Please write any comments or concerns on the comments section page that I have also attached to this e-mail. When your review is complete, e-mail me the completed comments page. Should you have any questions, please do not hesitate to contact me. I can be reached via e-mail at prsnq5@mail.missouri.edu or by phone at (573)-882-2200. I would appreciate any feedback you can provide ***by Monday, September 28, 2009 or as soon as possible.*** I realize this is a tight timeline, and if you are unable to help me, I understand. However, your help will be greatly appreciated.

Thanks in advance for your help with this review. Hopefully with your feedback and the feedback from others, this instrument will be quite useful to any institution wishing to assess factors that may influence teachers' decisions to teach certain aspects of agricultural education curriculum.

Sincerely,

Ryan Saucier

APPENDIX D

AGRICULTURAL CONSTRUCTION 1 AND/OR AGRICULTURAL CONSTRUCTION 2 CURRICULUM PROVIDED FOR THE PANEL OF EXPERTS

Directions: Evaluate the student by checking the appropriate number to indicate the degree of competence. The rating for each task should reflect employability readiness rather than the grades given in class.

Rating Scale: **3 = Mastered** – can work independently with no supervision

2 = Requires Supervision – can perform task completely with limited supervision

1 = Not Mastered – requires instruction and close supervision

N = No Exposure – no experience or knowledge regarding this task

Volume I

3	2	1	N	Arc Welding
				1. List safety procedures for arc welding.
				2. Identify the various types of metals and their properties.
				3. Prepare metals for welding: cutting, grinding, and/or cleaning.
				4. Weld in all positions with stick welder. (Shielded Metal Arc Welding) a. Weld in flat position using 6010 and 7018.
				b. Weld in horizontal position using 6010, 6011, and 7018.
				c. Weld in vertical up position using 6010, 6011, and 7018.
				d. Weld in vertical down position using 6010 and 6011.
				e. Weld in overhead position using 6010, 6011, and 7018.
				5. Weld in all positions with MIG welder. (Gas Metal Arc Welding) a. Weld in flat position using E-70S-3 and E71S-3.
				b. Weld in vertical position using E-70S-3 and E-71S-3.
				c. Weld in horizontal position using E-71S-3 and E-71S-3.
				d. Weld in overhead position using E-70S-3 and E-71S-3.
				6. Hardsurface areas where extensive wear may occur.
				7. Weld cast iron.
				8. Weld pipe.

3	2	1	N	**Project Construction**
				1. List the safety procedures for project construction.
				2. Select and design a project plan.
				3. List tools needed to complete project and list safety precautions.
				4. Develop a bill of materials and projected cost list.
				5. Determine a time frame for completion of a project.
				6. Interpret the project construction plan.
				7. Lay out and prepare materials for cutting.
				8. Determine construction design for proper hitching and balancing.
				9. Determine construction design for legal specifications: width, length, weight, etc.
				10. Identify and correct project defects by approved methods.
				11. Perform assembly procedures.
				12. Describe why a project should have a finish.
				13. Determine actual costs of materials and labor for projects.
				14. Hand and power tools used in completing this project.

Volume II

3	2	1	N	Oxy-Gas and Other Cutting/Welding Processes
				1. List the safety procedures required for using oxy-acetylene equipment.
				2. Perform in order the complete procedure for lighting, adjusting the flame and shutdown of the torch.
				3. Weld in all positions with oxy-gas welder.
				a. Weld in flat position.
				b. Weld in horizontal position.
				c. Weld in vertical position.
				d. Weld in overhead position.
				4. Perform a hardsurfacing operation.
				5. Weld cast iron using rod and flux.
				6. Perform a braze weld operation.
				7. Perform cutting with oxy-gas.
				8. Perform cutting with arc-air.
				9. Cut using the motorized torch.
				10. Select appropriate tip for the job to be performed.

3	2	1	N	Woodworking
				1. Identify common woods used in agricultural construction.
				2. Select the proper fastener for a specific job.
				3. List the actual and nominal dimensions of common construction lumber.
				4. Use hand woodworking tools.
				5. Use power woodworking tools.
				6. Select preservatives.

3	2	1	N	**Metals**
				1. Select metals by design and strength.
				2. Explain how construction metal is dimensioned.
				3. Remove stress risers.
				4. Identify common metal fasteners.
				5. Identify the hardness grade of a bolt.
				6. Control heat distortion of metals.
				7. Assemble work using proper locks and fasteners.
				8. Use heat to shape metals.
				9. Use tap and die set to do threading.
				10. List steps used in tempering, annealing, hardening, wrinkle bending, normalizing and welding to control crystallization.

3	2	1	N	**Finishing**
				1. Prepare surfaces for finishing.
				2. Select the primer to use before painting the surface.
				3. Select the paint to use in the finish operation.
				4. List the steps for cleanup after finishing operation is complete.

APPENDIX E

PURPOSE AND RESEARCH QUESTIONS PROVIDED TO THE PANEL OF EXPERTS

Dissertation Purpose and Objectives

Purpose

The purpose of this study was to assess factors that influence Missouri school-based agricultural educators to teach major components of the agricultural mechanics curriculum. The following research questions were used to guide this study:

Research Questions

The following research questions were developed to guide this study:

1. What are the personal, professional, and program characteristics (age, sex, years of teaching experience, type of teacher certification, university semester credit hours earned in agricultural mechanics, student enrollment in a school-based agricultural education program , time spent supervising student agricultural mechanics Supervised Agricultural Experience (SAE) projects per week, student participation in agricultural mechanics related events, university from which undergraduate degree was earned, FFA area in which school of employment is located, and satisfaction with the teacher education program from which certification was earned regarding preparation to teach agricultural mechanics) of school-based agricultural educators in Missouri who teach Agricultural Construction 1 and/or Agricultural Construction 2?

2. Which of the selected components of the Agricultural Construction 1 and/or Agricultural Construction 2 curriculum do Missouri school-based agricultural educators teach?

3. What factors influence Missouri school-based agricultural educators’ decisions to teach selected curriculum components in Agricultural Construction 1 and/or Agricultural Construction 2?

4. Does a relationship exist between and among teachers’ choice to teach selected components of the Agricultural Construction 1 and/or Agricultural Construction 2 curriculum, the self-perceived factors that influence teachers decision to teach selected components of the Agricultural Construction 1 and/or Agricultural Construction 2 curriculum, and their personal, professional, and program characteristics (age, sex, years of teaching experience, university semester credit hours earned in agricultural mechanics, student enrollment in a school-based agricultural education program, teacher certification type, and time spent supervising student agricultural mechanics SAE projects per week)?

APPENDIX F

COMMENTS PAGE PROVIDED TO THE PANEL OF EXPERTS

Missouri Agricultural Construction I & II Curriculum Assessment

Panel of Experts Comments:

APPENDIX G

E-MAIL PRE-NOTICE INVITATION TO PARTICIPANTS

E-mail Subject Line: Important Agricultural Mechanics Study

Dear [Missouri Agriculture Teacher]: October 26, 2009

Agricultural mechanics is an important part of many agricultural education programs. As a teacher of Agricultural Construction 1 and/or Agricultural Construction 2, I think you will agree. In a few days, you will receive an e-mail from me asking for your participation in a study to determine the factors that influence teachers like yourself to teach the curriculum found within the course Agricultural Construction 1 and/or Agricultural Construction 2. If you choose to participate in this study, please follow the embedded URL link on the e-mail to an online questionnaire. If you have any questions or concerns, please feel free to contact me at (573)882-2200 or prsnq5@mail.missouri.edu. Thank you.

Sincerely,

Ryan Saucier

APPENDIX H

E-MAIL INVITATION TO PARTICIPANTS

E-mail Subject Line: Agricultural Mechanics Questionnaire

Dear [Missouri Agriculture Teacher]: 10/29/2009

I think you will agree with me that the preparation of future Missouri agriculture teachers and the continued education of existing Missouri agriculture teachers is a very important issue within agricultural education. Therefore, I am requesting your assistance with the completion of an online questionnaire concerning the instruction of agricultural mechanics within Missouri secondary agricultural education programs.

Thank you in advance for agreeing to help me with my dissertation questionnaire. Your responses are extremely valuable to me and I appreciate your time. Please follow the URL link below to the online questionnaire. When you arrive at the questionnaire, please read the directions and answer all of the questions for each section.

The completion of this questionnaire should take you about 5 to 10 minutes. Please complete this questionnaire by November 2, 2009. If you have any questions or concerns, please feel free to contact me at ryan@teachagriculturaleducation.org or (573)-882-2200. If you have any questions concerning the questionnaire, please contact the University of Missouri Institutional Review Board at (573)-882-9585. Once again, thank you for your help.

Sincerely,

Ryan Saucier

[Embedded URL Link]

APPENDIX I

FIRST FOLLOW-UP E-MAIL TO PARTICIPANTS

E-mail Subject Line: Agricultural Mechanics Questionnaire

Dear [Missouri Agriculture Teacher]: 11/2/2009

A few days ago, you were sent a request to complete an online questionnaire regarding the "Agricultural Construction I & II" curriculum. Please follow the URL link below to the online questionnaire. When you arrive at the questionnaire, please read the directions and answer all of the questions for each section. Your help is greatly appreciated. Please complete this questionnaire as soon as possible. Thank you.

Sincerely,

Ryan Saucier

[Embedded URL Link]

APPENDIX J

SECOND FOLLOW-UP E-MAIL TO PARTICIPANTS

E-Mail Subject Line: Agricultural Mechanics Questionnaire

Dear [Missouri Agriculture Teacher]: 11/5/2009

About a week ago, you were sent a request to complete an online questionnaire concerning the "Agricultural Construction I & II" curriculum. Please follow the URL link listed below to the online questionnaire. Please complete the questionnaire as soon as possible. Thank you for your help.

Sincerely,

Ryan Saucier

[Embedded URL Link]

APPENDIX K

FINAL FOLLOW-UP E-MAIL TO PARTICIPANTS

E-Mail Subject Line: Your help is needed - Agricultural Construction questionnaire

Dear [Missouri Agriculture Teacher]: November 6, 2009

Greetings. My name is Ryan Saucier. I am a former ag teacher from Texas and am currently working on my Ph.D. in agricultural education at the University of Missouri. My dissertation research is seeking to understand why Missouri agriculture teachers choose to teach the curriculum topics found within Agricultural Construction 1 and/or Agricultural Construction 2.

A couple of weeks ago you were sent an online, web-based questionnaire. As of yet, I have not received your response. Please take the next 5 minutes, follow the embedded URL link listed near the bottom of this message, and complete the questionnaire.

If you have already responded to this questionnaire, thank you. Your name will entered into a drawing for $100 cash. If you have not responded, please do not pass up your opportunity to win this incentive. Thank you.

Sincerely,

Ryan Saucier

[Embedded URL Link]

APPENDIX L

SOPER'S EFFECT SIZE CALCULATOR FOR MULTIPLE REGRESSION


Sunday, February 28, 2010
Home | About | Software | Statistics Calculators | Programming | Web Development
DanielSoper.com
Statistics Calculators
version 2.0
Now over 1 million uses!
Stat Analysis Made Simple
Our Free Open Source Software Cuts Costs by 90%. Download Today!
www.REvolution-Computing.com
Ads by Google
Effect Size Calculator for Multiple Regression
This calculator will tell you the effect size for multiple regression (f^2), given a value of R^2.
Please supply the necessary parameter, and then click the 'Calculate' button.
R^2: 0.25
Also know as the squared multiple correlation or the coefficient of determination.
Effect Size (f^2): 0.333333
Calculate
Multiple Regression
Standard and Professional versions. Microsoft Excel interface. Demo.
www.sagata.com
Statistical Computing
Advanced & Robust Computing Power That Researchers Need. Free Trial!
www.Systat.com
Ads by Google
The Statistics Calculators index now contains 56 free statistics calculators.
You may also be interested in:
Interaction - a software program by Daniel Soper for drawing and analyzing statistical interactions.
N2Mplus - a free software program by Daniel Soper for converting Excel and SPSS files into Mplus-compatible data files and syntax.
The statistics calculators have been used 2,669,129 times.
Citing these calculators. Feedback.
Copyright © 2004-2010 by Daniel S. Soper. All rights reserved.

APPENDIX M

INDIVIDUAL INFLUENCE RATINGS OF FACTORS THAT INFLUENCE TEACHERS DECISIONS TO TEACH ARC WELDING CURRICULUM

Table 35

Factors Influencing Missouri School-Based Agriculture Teachers to Instruct Arc Welding Curriculum (n = 172)

	Central Tendency			Variability		
Factors	Mean	Median	Mode	Variance	*SD*	Range
Personal Importance	3.50	4.00	4.00	0.39	0.63	3.00
Personal Ability to Teach	3.24	3.00	4.00	0.81	0.90	4.00
Personal Interest in Teaching	3.23	3.00	4.00	0.90	0.95	4.00
Experience in Teaching	3.15	3.00	4.00	0.81	0.90	4.00
Equipment Available to Teach	3.13	3.00	4.00	0.85	0.92	3.00
Student Importance	3.11	3.00	4.00	0.87	0.93	4.00
Facilities Available to Teach	3.02	3.00	4.00	0.91	0.95	3.00
Community Importance	2.84	3.00	3.00	0.75	0.87	3.00
Budget Available to Teach	2.78	3.00	4.00	1.05	1.02	4.00
Administration Importance	2.41	2.50	3.00	1.20	1.10	4.00

Note. Levels of Influence: 0 to .50 = No Influence, .51 to 1.50 = Little Influence, 1.51 to 2.50 = Some Influence, 2.51 to 3.50 = Moderate Influence, 3.51 to 4.00 = Great Influence.

APPENDIX N

INDIVIDUAL INFLUENCE RATINGS OF FACTORS THAT INFLUENCE TEACHERS DECISIONS TO TEACH PROJECT CONSTRUCTION CURRICULUM

Table 36

Factors Influencing Missouri School-Based Agriculture Teachers to Instruct Project Construction Curriculum (*n* = 181)

	Central Tendency			Variability		
Factors	Mean	Median	Mode	Variance	*SD*	Range
Personal Importance	3.40	4.00	4.00	0.53	0.73	4.00
Personal Interest in Teaching	3.22	3.00	4.00	0.83	0.91	4.00
Experience in Teaching	3.15	3.00	4.00	0.77	0.88	4.00
Equipment Available to Teach	3.15	3.00	4.00	0.79	0.89	4.00
Personal Ability to Teach	3.12	3.00	3.00	0.76	0.87	4.00
Facilities Available to Teach	3.11	3.00	4.00	0.89	0.94	4.00
Student Importance	3.06	3.00	3.00	0.88	0.77	4.00
Community Importance	2.96	3.00	3.00	0.96	0.98	4.00
Budget Available to Teach	2.89	3.00	4.00	1.03	1.02	4.00
Administration Importance	2.57	3.00	3.00	1.19	1.09	4.00

Note. Levels of Influence: 0 to .50 = No Influence, .51 to 1.50 = Little Influence, 1.51 to 2.50 = Some Influence, 2.51 to 3.50 = Moderate Influence, 3.51 to 4.00 = Great Influence.

APPENDIX O

INDIVIDUAL INFLUENCE RATINGS OF FACTORS THAT INFLUENCE TEACHERS DECISIONS TO TEACH OXY-GAS AND OTHER CUTTING/WELDING PROCESSES CURRICULUM

Table 37

Factors Influencing Missouri School-Based Agriculture Teachers to Instruct Oxy-Gas Cutting/Welding Curriculum (*n* = 171)

	Central Tendency			Variability		
Factors	Mean	Median	Mode	Variance	*SD*	Range
Personal Importance	3.16	3.00	3.00	0.65	0.81	4.00
Experience in Teaching	2.97	3.00	3.00	0.78	0.88	4.00
Personal Ability to Teach	2.96	3.00	3.00	0.97	0.99	4.00
Equipment Available to Teach	2.94	3.00	3.00	0.91	0.95	4.00
Personal Interest in Teaching	2.93	3.00	3.00	0.97	0.99	4.00
Facilities Available to Teach	2.88	3.00	3.00	0.94	0.97	4.00
Budget Available to Teach	2.75	3.00	2.00	1.01	1.00	4.00
Student Importance	2.71	3.00	3.00	0.90	0.95	4.00
Community Importance	2.54	3.00	3.00	1.00	1.00	4.00
Administration Importance	2.24	2.00	2.00	1.08	1.04	4.00

Note. Levels of Influence: 0 to .50 = No Influence, .51 to 1.50 = Little Influence, 1.51 to 2.50 = Some Influence, 2.51 to 3.50 = Moderate Influence, 3.51 to 4.00 = Great Influence.

APPENDIX P

INDIVIDUAL INFLUENCE RATINGS OF FACTORS THAT INFLUENCE TEACHERS DECISIONS TO TEACH WOODWORKING CURRICULUM

Table 38

Factors Influencing Missouri School-Based Agriculture Teachers to Instruct Woodworking Curriculum (*n* = 124)

	Central Tendency			Variability		
Factors	Mean	Median	Mode	Variance	*SD*	Range
Personal Importance	2.98	3.00	4.00	0.76	0.87	3.00
Personal Ability to Teach	2.83	3.00	4.00	1.02	1.01	4.00
Equipment Available to Teach	2.82	3.00	2.00	0.83	0.91	3.00
Facilities Available to Teach	2.76	3.00	2.00	0.93	0.97	4.00
Personal Interest in Teaching	2.75	3.00	2.00	1.12	1.06	4.00
Experience in Teaching	2.73	3.00	3.00	0.98	0.99	4.00
Student Importance	2.63	3.00	2.00	0.85	0.92	4.00
Budget Available to Teach	2.56	2.00	2.00	0.92	0.96	3.00
Community Importance	2.42	2.00	2.00	0.93	0.96	4.00
Administration Importance	2.26	2.00	2.00	0.89	0.95	4.00

Note. Levels of Influence: 0 to .50 = No Influence, .51 to 1.50 = Little Influence, 1.51 to 2.50 = Some Influence, 2.51 to 3.50 = Moderate Influence, 3.51 to 4.00 = Great Influence.

APPENDIX Q

INDIVIDUAL INFLUENCE RATINGS OF FACTORS THAT INFLUENCE TEACHERS DECISIONS TO TEACH METALS CURRICULUM

Table 39

Factors Influencing Missouri School-Based Agriculture Teachers to Instruct Metals Curriculum (*n* = 140)

	Central Tendency			Variability		
Factors	Mean	Median	Mode	Variance	*SD*	Range
Personal Importance	2.72	3.00	2.00	0.82	0.91	4.00
Personal Interest in Teaching	2.56	3.00	3.00	1.13	1.06	4.00
Equipment Available to Teach	2.54	3.00	2.00	1.14	1.07	4.00
Facilities Available to Teach	2.53	2.50	2.00	1.13	1.06	4.00
Experience in Teaching	2.50	3.00	3.00	0.96	0.98	4.00
Personal Ability to Teach	2.47	2.00	2.00	1.04	1.02	4.00
Budget Available to Teach	2.40	2.00	2.00	1.25	1.12	4.00
Student Importance	2.24	2.00	2.00	0.99	1.00	4.00
Community Importance	2.15	2.00	2.00	1.00	1.00	4.00
Administration Importance	1.95	2.00	2.00	1.13	1.06	4.00

Note. Levels of Influence: 0 to .50 = No Influence, .51 to 1.50 = Little Influence, 1.51 to 2.50 = Some Influence, 2.51 to 3.50 = Moderate Influence, 3.51 to 4.00 = Great Influence.

APPENDIX R

INDIVIDUAL INFLUENCE RATINGS OF FACTORS THAT INFLUENCE

TEACHERS DECISIONS TO TEACH FINISHING CURRICULUM

Table 40

Factors Influencing Missouri School-Based Agriculture Teachers to Instruct Finishing Curriculum (*n* = 140)

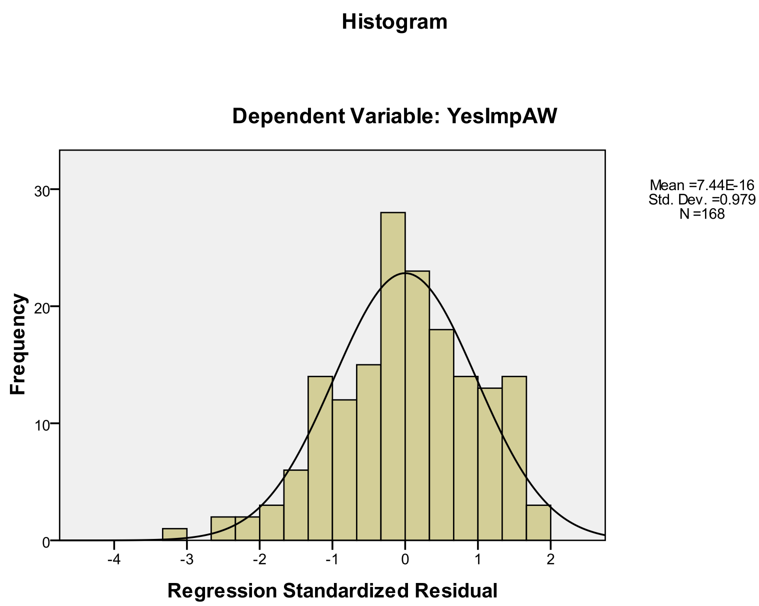
		Central Tendency			Variability	
Factors	Mean	Median	Mode	Variance	*SD*	Range
Personal Importance	2.86	3.00	3.00	0.91	0.95	4.00
Personal Ability to Teach	2.66	3.00	2.00	0.92	0.96	4.00
Personal Interest in Teaching	2.63	3.00	2.00	0.99	0.99	4.00
Experience in Teaching	2.59	3.00	3.00	0.98	0.99	4.00
Facilities Available to Teach	2.48	3.00	2.00	1.25	1.12	4.00
Equipment Available to Teach	2.46	3.00	3.00	1.26	1.12	4.00
Student Importance	2.42	2.00	2.00	1.02	1.01	4.00
Budget Available to Teach	2.38	2.00	2.00	1.35	1.16	4.00
Community Importance	2.34	2.00	2.00	1.11	1.06	4.00
Administration Importance	2.12	2.00	2.00	1.19	1.09	4.00

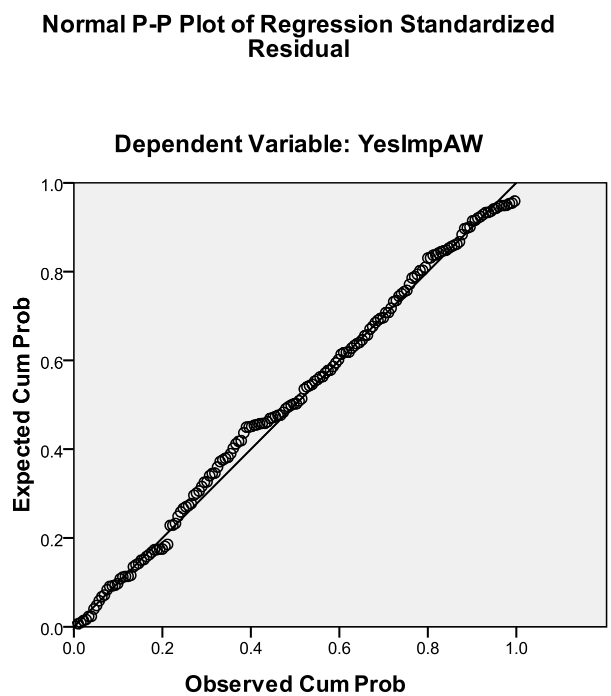
Note. Levels of Influence: 0 to .50 = No Influence, .51 to 1.50 = Little Influence, 1.51 to 2.50 = Some Influence, 2.51 to 3.50 = Moderate Influence, 3.51 to 4.00 = Great Influence.

APPENDIX S

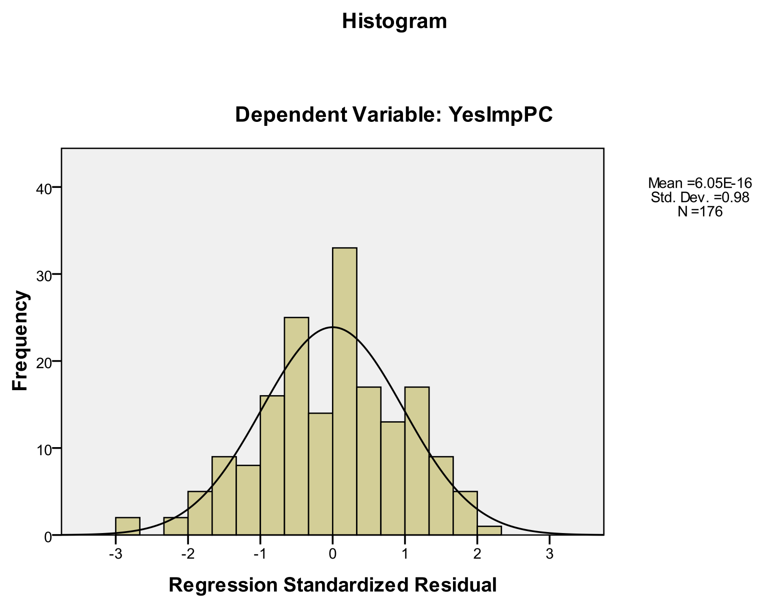
VISUAL INSPECTIONS FOR HOMOSCEDASTICITY: HISTOGRAMS AND PP PLOTS

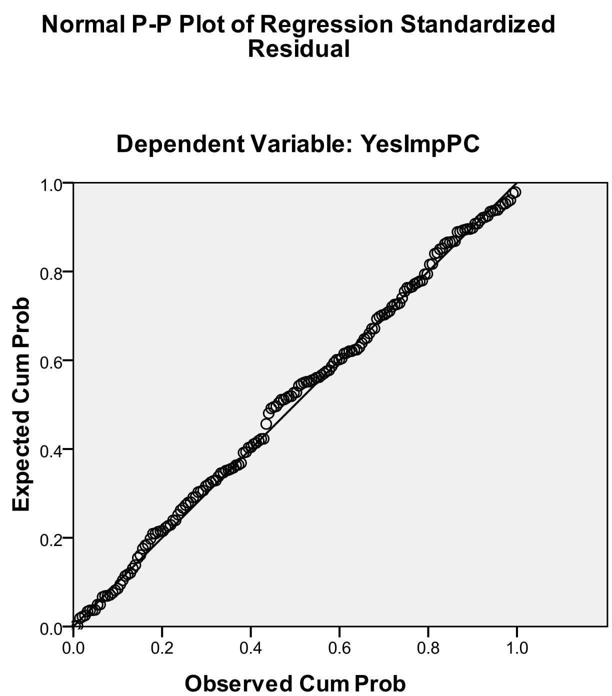
Relationship of Importance of Teaching Arc Welding Curriculum (Dependent Variables) and Teacher Characteristics (Independent Variables)



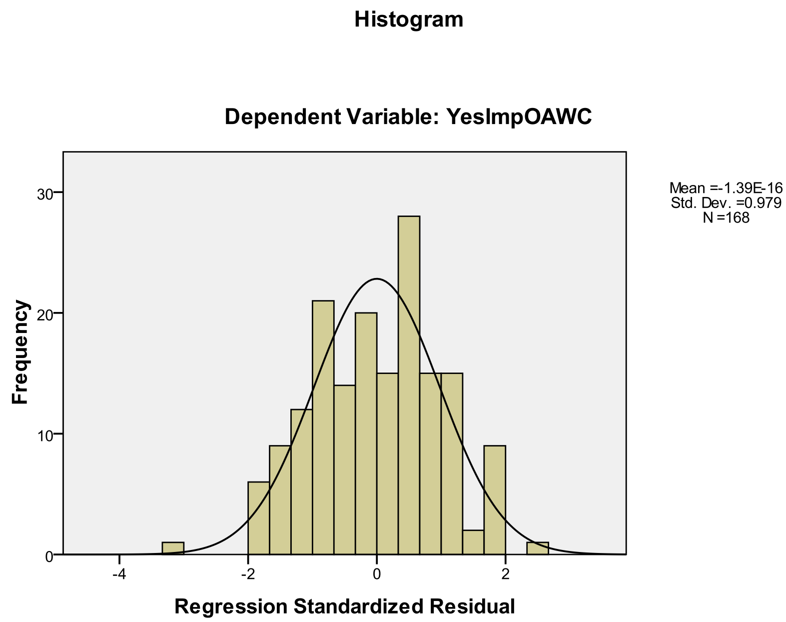


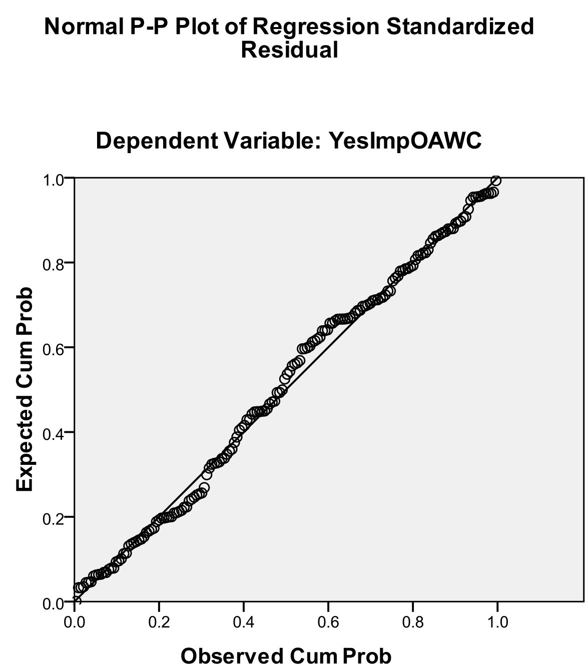
Relationship of Importance of Teaching Project Construction Curriculum (Dependent Variables) and Teacher Characteristics (Independent Variables)



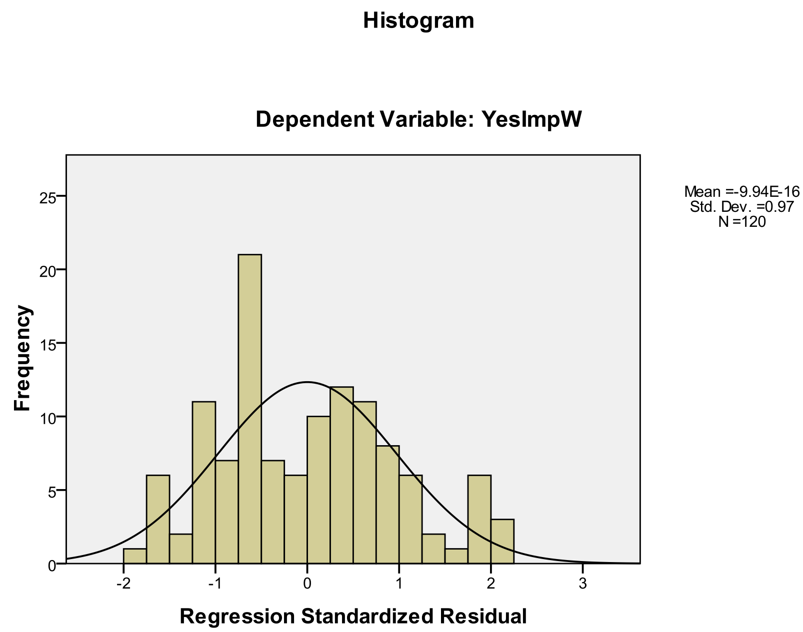


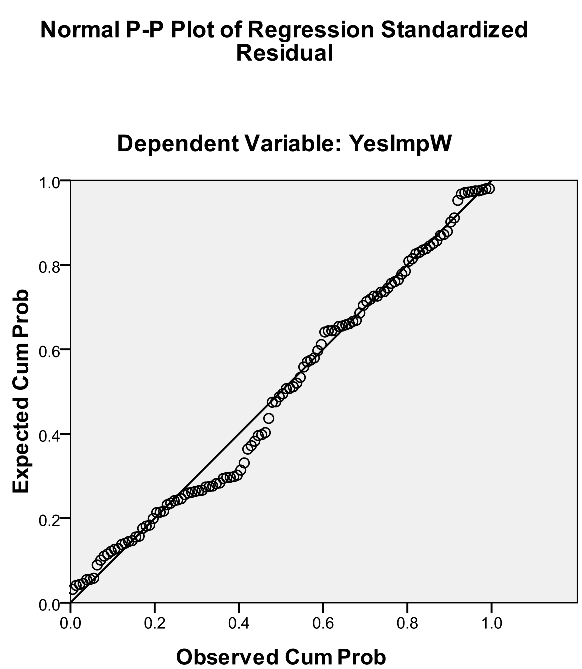
Relationship of Importance of Teaching Oxy/Gas and Other Cutting/Welding Processes Curriculum (Dependent Variables) and Teacher Characteristics (Independent Variables)



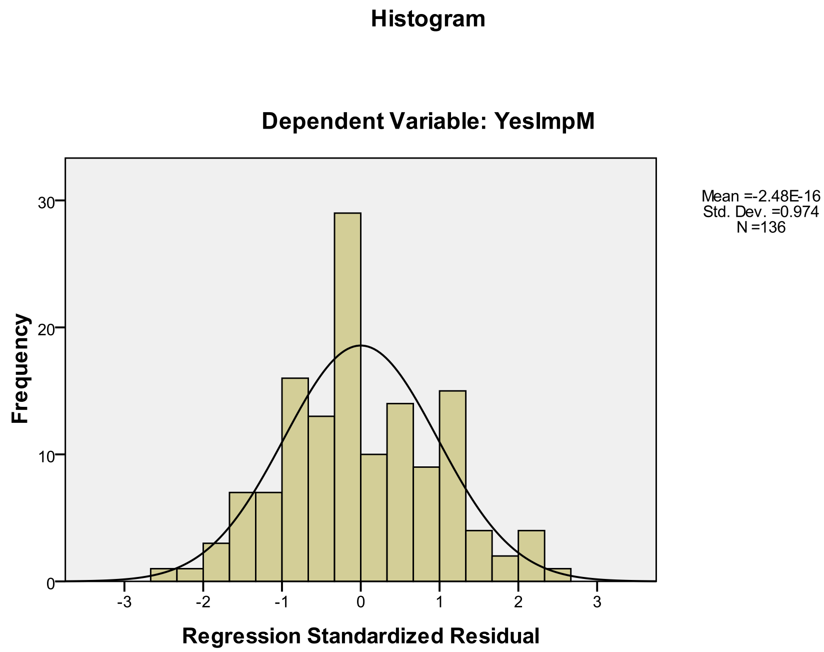


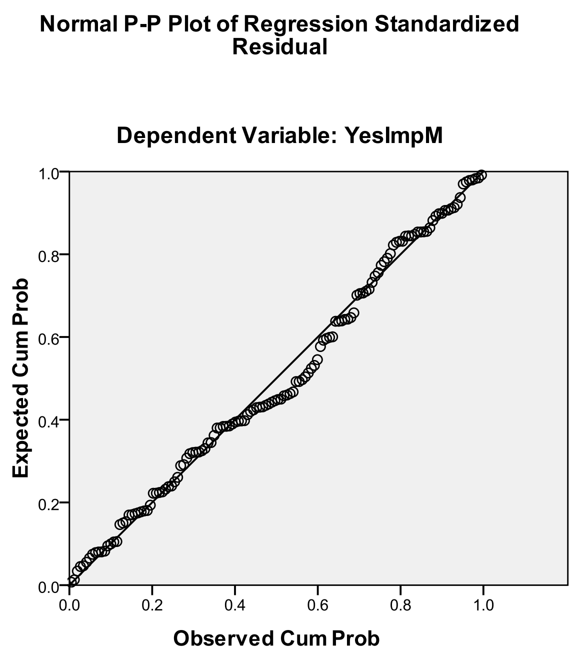
Relationship of Importance of Teaching Woodworking Curriculum (Dependent Variables) and Teacher Characteristics (Independent Variables)



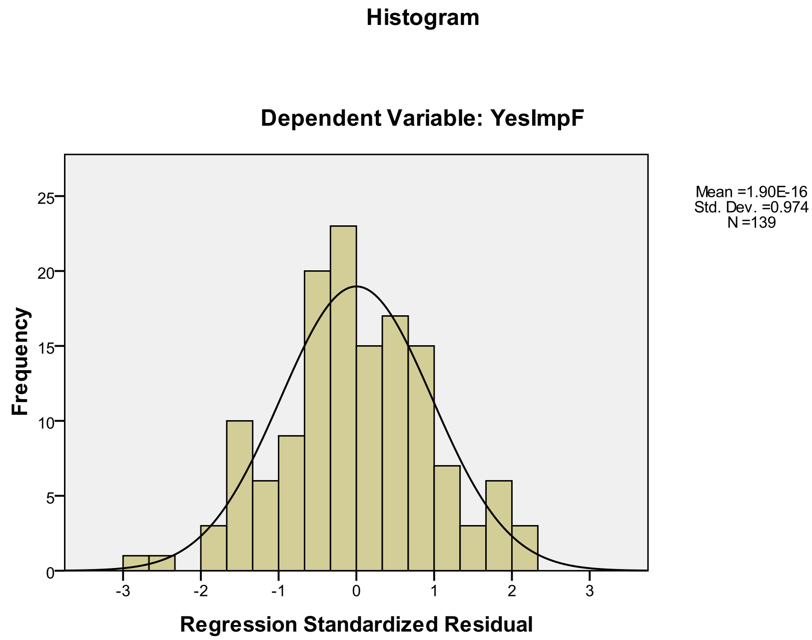


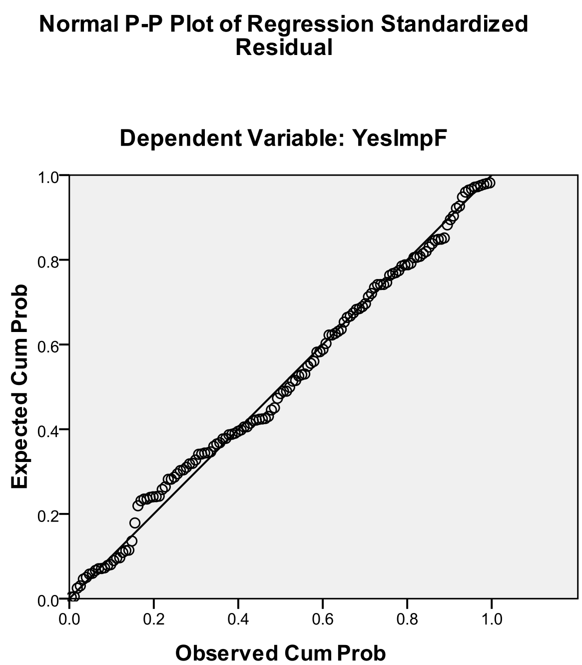
Relationship of Importance of Teaching Metals Curriculum (Dependent Variables) and Teacher Characteristics (Independent Variables)



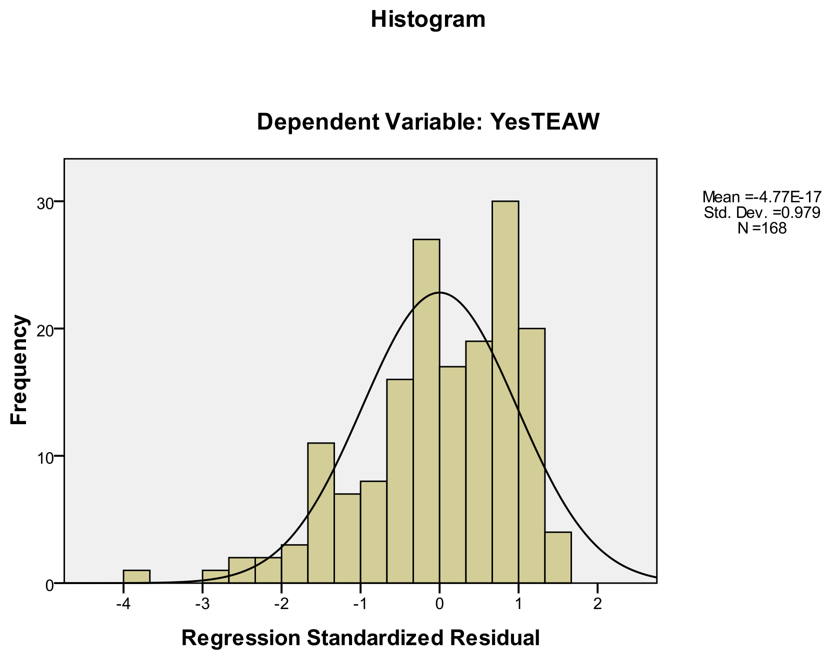


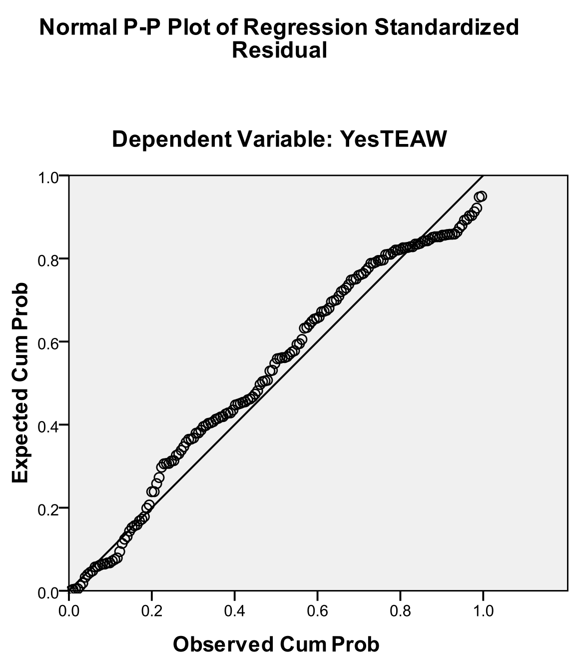
Relationship of Importance of Teaching Finishing Curriculum (Dependent Variables) and Teacher Characteristics (Independent Variables)





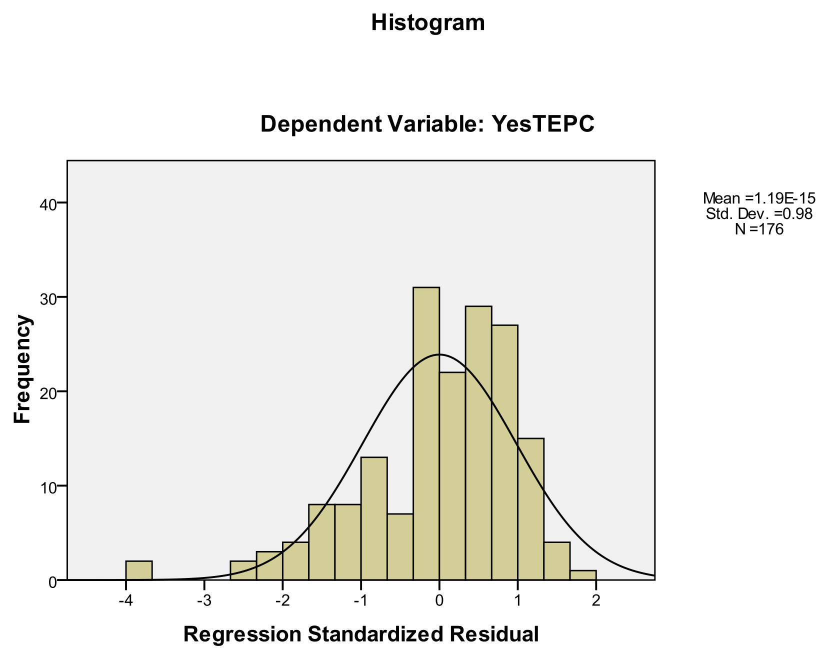
Relationship of Teachers' Self-Efficacy on Teaching Arc Welding Curriculum (Dependent Variables) and Teacher Characteristics (Independent Variables)

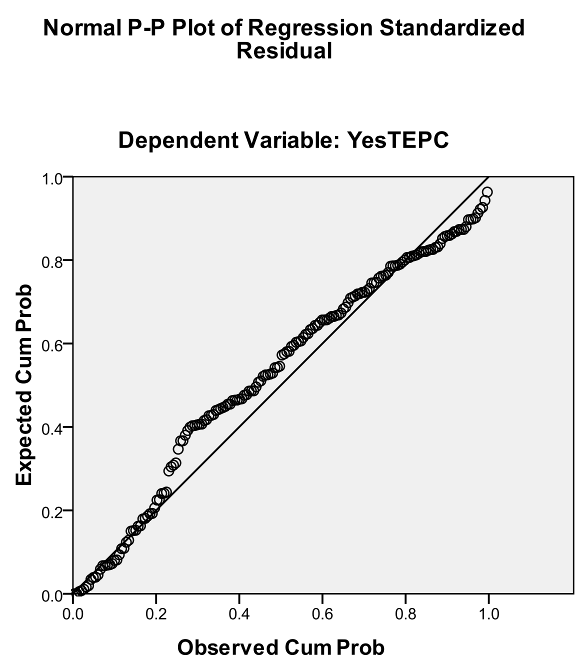




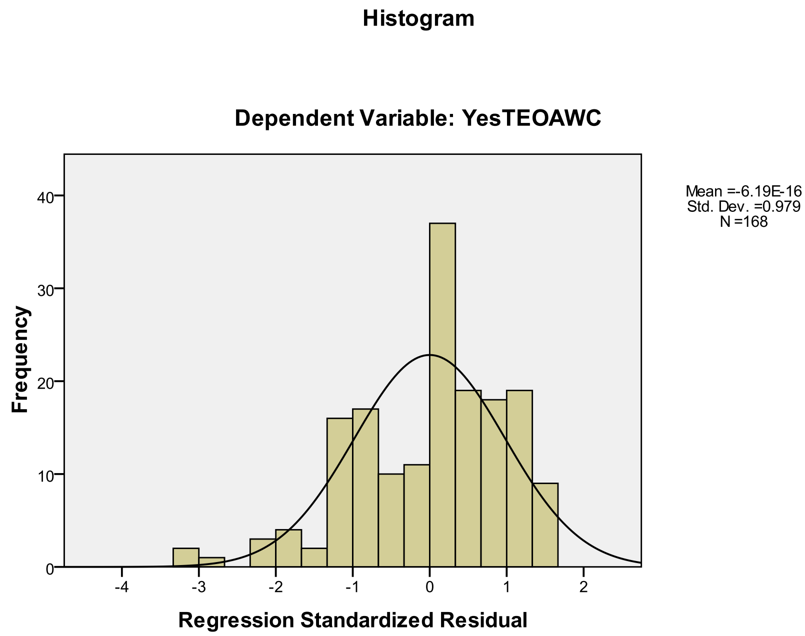
Relationship of Teachers' Self-Efficacy on Teaching Project Construction Curriculum

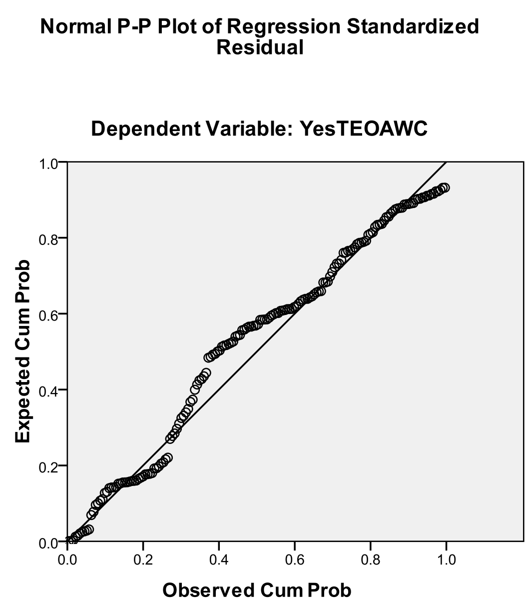
(Dependent Variables) and Teacher Characteristics (Independent Variables)





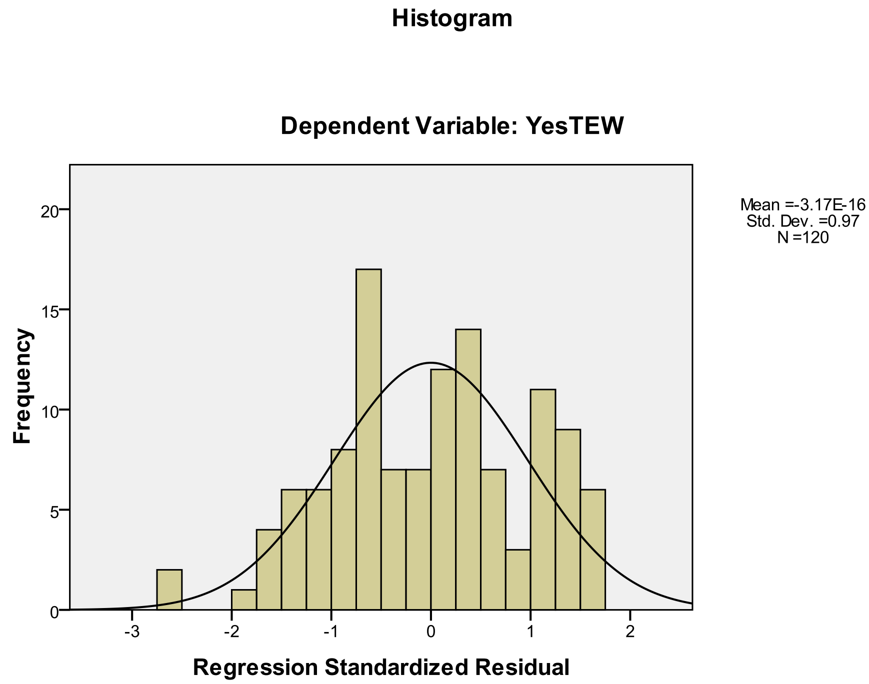
Relationship of Teachers' Self-Efficacy on Teaching Oxy/Gas and Other Cutting/Welding Processes Curriculum (Dependent Variables) and Teacher Characteristics (Independent Variables)

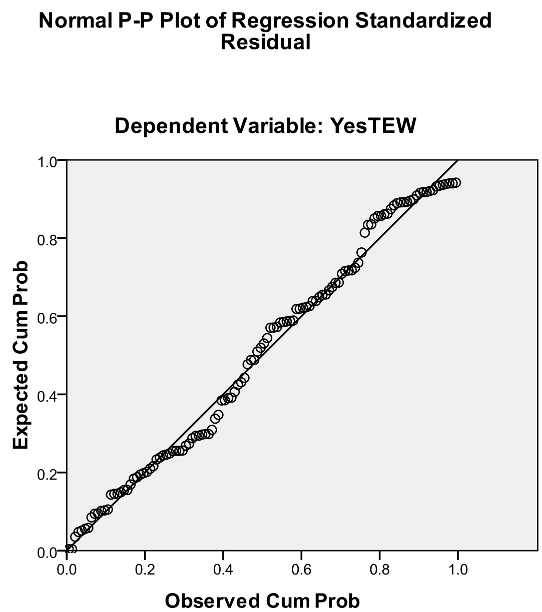




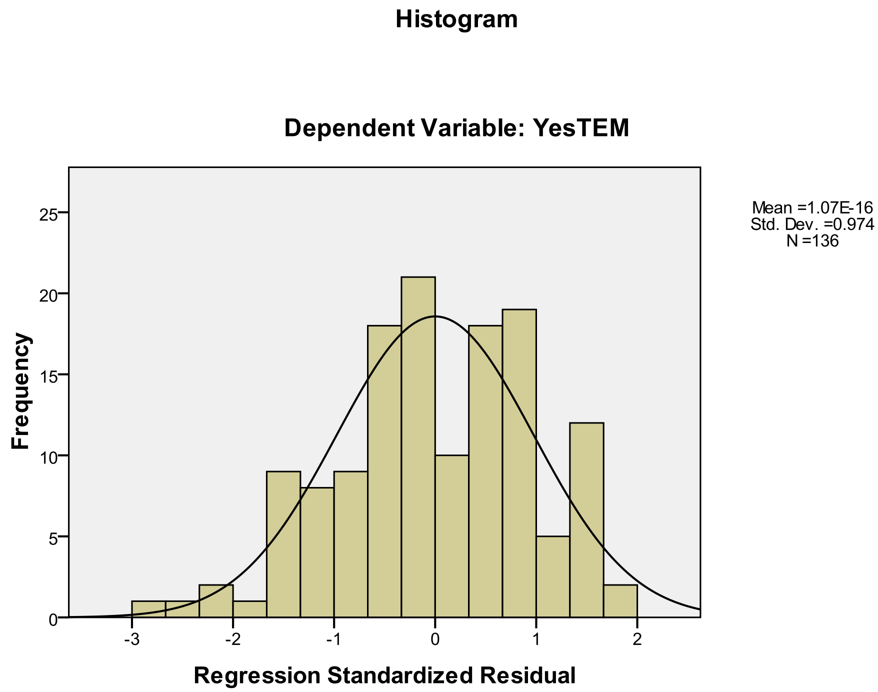
Relationship of Teachers' Self-Efficacy on Teaching Woodworking Curriculum

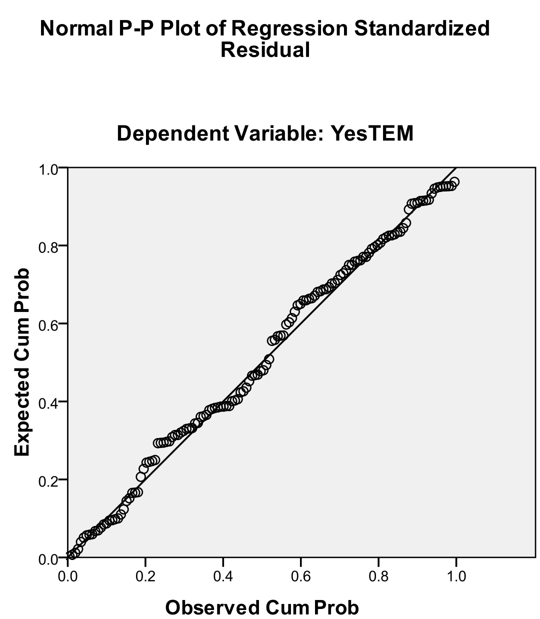
(Dependent Variables) and Teacher Characteristics (Independent Variables)



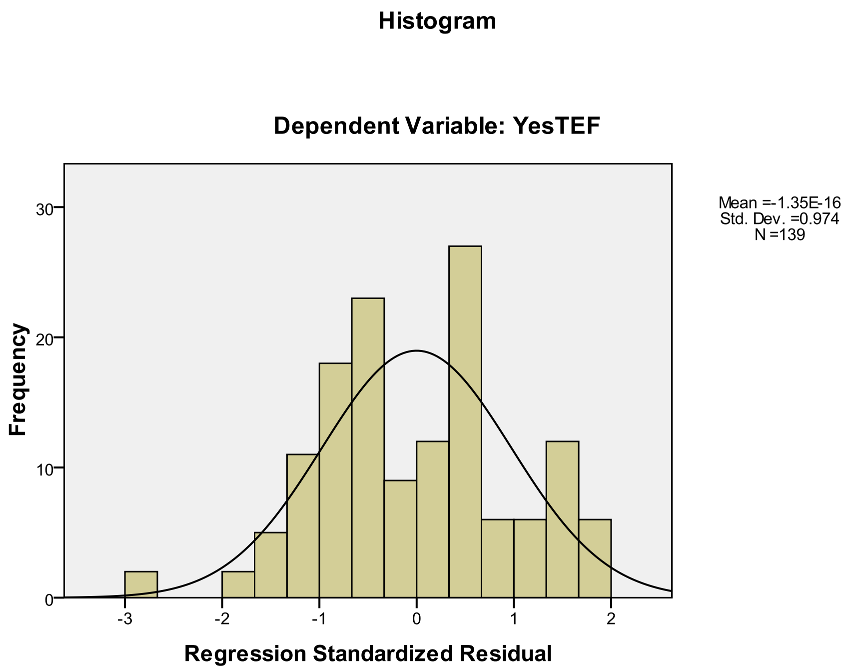


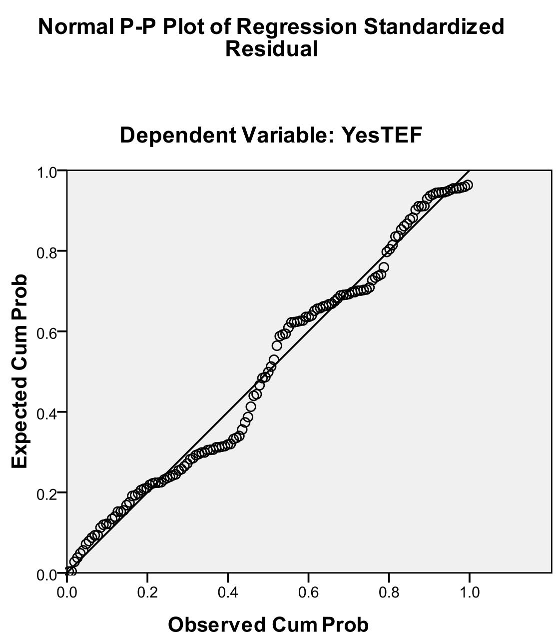
Relationship of Teachers' Self-Efficacy on Teaching Metals Curriculum (Dependent Variables) and Teacher Characteristics (Independent Variables)





Relationship of Teachers' Self-Efficacy on Teaching Finishing Curriculum (Dependent Variables) and Teacher Characteristics (Independent Variables)





APPENDIX T

BIVARIATE INTERCORRELATION TABLES BETWEEN TEACHER CHARACTERISTICS AND THE SUMMATED VARIABLES IMPORTANCE TO TEACH AND TEACHER SELF-EFFICACY FOR EACH CURRICULUM AREA

Table 41

Summary Table of Bivariate Intercorrelation Between Teacher Characteristics for the Relationship of Importance of Teaching Arc Welding Curriculum (n = 168)

Variables	Y_1	X_1	X_2	X_3	X_4	X_5	X_6	X_7
Importance of Teaching Arc Welding Curriculum (Y_1)	1.00	-.02	.11	.10	.09	.06	.06	-.07
Sex[a] (X_1)		1.00	-.25	-.22	-.19	-.22	.10	.09
Age (X_2)			1.00	.28	.84	.14	-.16	.13
University semester credit hours earned in agricultural mechanics (X_3)				1.00	.23	.05	-.01	-.11
Years of teaching experience (X_4)					1.00	.21	-.17	.34
Student enrollment in school-based agricultural education programs (X_5)						1.00	.00	.13
Average number of hours spent weekly supervising student agricultural mechanics SAE projects (X_6)							1.00	-.15
Type of teacher certification[b] (X_7)								1.00

Note: Sex[a] : Male = 1, Female = 2; Type of Teacher Certification[b]: Traditional = 1, Alternative = 2.

Table 42

Summary Table of Bivariate Intercorrelation Between Teacher Characteristics for the Relationship of Importance of Teaching Project Construction Curriculum (*n* = 176)

Variables	Y_1	X_1	X_2	X_3	X_4	X_5	X_6	X_7
Importance of Teaching Project Construction Curriculum (Y_1)	1.00	.03	-.03	.14	.02	.18	.20	-.04
Sex[a] (X_1)		1.00	-.26	-.22	-.21	-.19	.09	.09
Age (X_2)			1.00	.28	.86	.12	-.15	.11
University semester credit hours earned in agricultural mechanics (X_3)				1.00	.23	.04	-.01	-.10
Years of teaching experience (X_4)					1.00	.19	-.16	.34
Student enrollment in school-based agricultural education programs (X_5)						1.00	.05	.14
Average number of hours spent weekly supervising student agricultural mechanics SAE projects (X_6)							1.00	-.13
Type of teaching certification[b] (X_7)								1.00

Note: Sex[a] : Male = 1, Female = 2; Type of Teacher Certification[b]: Traditional = 1, Alternative = 2.

Table 43

Summary Table of Bivariate Intercorrelation Between Teacher Characteristics for the Relationship of Importance of Teaching Oxy-Gas and Other Cutting/Welding Processes Curriculum (n = 168)

Variables	Y_1	X_1	X_2	X_3	X_4	X_5	X_6	X_7
Importance of Teaching Oxy-Gas and Other Cutting/Welding Processes Curriculum (Y_1)	1.00	-.02	.00	.11	.06	.05	.03	-.12
Sex[a] (X_1)		1.00	-.24	-.21	-.19	-.21	.09	.08
Age (X_2)			1.00	.27	.84	.11	-.15	.14
University semester credit hours earned in agricultural mechanics (X_3)				1.00	.25	.04	-.01	-.08
Years of teaching experience (X_4)					1.00	.18	-.16	.34
Student enrollment in school-based agricultural education programs (X_5)						1.00	.04	.13
Average number of hours spent weekly supervising student agricultural mechanics SAE projects (X_6)							1.00	-.14
Type of teaching certification[b] (X_7)								1.00

Note: Sex[a] : Male = 1, Female = 2; Type of Teacher Certification[b]: Traditional = 1, Alternative = 2.

Table 44

Summary Table of Bivariate Intercorrelation Between Teacher Characteristics for the Relationship of Importance of Teaching Woodworking Curriculum (n = 120)

Variables	Y_1	X_1	X_2	X_3	X_4	X_5	X_6	X_7
Importance of Teaching Woodworking Curriculum (Y_1)	1.00	.11	.02	.07	-.01	-.08	.06	-.13
Sex[a] (X_1)		1.00	-.18	-.21	-.13	-.16	.02	.14
Age (X_2)			1.00	.25	.88	.12	-.14	.18
University semester credit hours earned in agricultural mechanics (X_3)				1.00	.18	.05	-.05	-.20
Years of teaching experience (X_4)					1.00	.15	-.16	.32
Student enrollment in school-based agricultural education programs (X_5)						1.00	.10	.10
Average number of hours spent weekly supervising student agricultural mechanics SAE projects (X_6)							1.00	-.18
Type of teaching certification[b] (X_7)								1.00

Note: Sex[a] : Male = 1, Female = 2; Type of Teacher Certification[b]: Traditional = 1, Alternative = 2.

Table 45

Summary Table of Bivariate Intercorrelation Between Teacher Characteristics for the Relationship of Importance of Teaching Metals Curriculum (*n* = 136)

Variables	Y_1	X_1	X_2	X_3	X_4	X_5	X_6	X_7
Importance of Teaching Metals Curriculum (Y_1)	1.00	.08	-.03	-.03	.02	.06	.24	.05
Sex[a] (X_1)		1.00	-.11	-.15	-.07	-.21	.13	.13
Age (X_2)			1.00	.28	.85	.07	-.18	.11
University semester credit hours earned in agricultural mechanics (X_3)				1.00	.25	.03	-.02	-.04
Years of teaching experience (X_4)					1.00	.12	-.15	.33
Student enrollment in school-based agricultural education programs (X_5)						1.00	.08	.12
Average number of hours spent weekly supervising student agricultural mechanics SAE projects (X_6)							1.00	-.14
Type of teaching certification[b] (X_7)								1.00

Note: Sex[a]: Male = 1, Female = 2; Type of Teacher Certification[b]: Traditional = 1, Alternative = 2.

Table 46

Summary Table of Bivariate Intercorrelation Between Teacher Characteristics for the Relationship of Importance of Teaching Finishing Curriculum (n = 139)

Variables	Y_1	X_1	X_2	X_3	X_4	X_5	X_6	X_7
Importance of Teaching Finishing Curriculum (Y_1)	1.00	.08	-.01	.02	.02	.15	.10	-.03
Sex[a] (X_1)		1.00	-.19	-.21	-.14	-.20	.07	.08
Age (X_2)			1.00	.51	.88	.09	-.15	.16
University semester credit hours earned in agricultural mechanics (X_3)				1.00	.43	.09	.01	.04
Years of teaching experience (X_4)					1.00	.15	-.17	.33
Student enrollment in school-based agricultural education programs (X_5)						1.00	.06	.12
Average number of hours spent weekly supervising student agricultural mechanics SAE projects (X_6)							1.00	-.16
Type of teaching certification[b] (X_7)								1.00

Note: Sex[a] : Male = 1, Female = 2; Type of Teacher Certification[b]: Traditional = 1, Alternative = 2.

Table 47

Summary Table of Bivariate Intercorrelation Between Teacher Characteristics for the Level of Teachers' Self-Efficacy on Teaching Arc Welding Curriculum (n = 168)

Variables	Y_1	X_1	X_2	X_3	X_4	X_5	X_6	X_7
Level of Teachers' Self-Efficacy on Teaching Arc Welding Curriculum (Y_1)	1.00	-.19	-.02	.19	.00	.08	.16	.00
Sex[a] (X_1)		1.00	-.25	-.22	-.19	-.22	.10	.09
Age (X_2)			1.00	.28	.84	.14	-.16	.13
University semester credit hours earned in agricultural mechanics (X_3)				1.00	.23	.05	-.01	-.11
Years of teaching experience (X_4)					1.00	.21	-.17	.34
Student enrollment in school-based agricultural education programs (X_5)						1.00	.00	.13
Average number of hours spent weekly supervising student agricultural mechanics SAE projects (X_6)							1.00	-.15
Type of teaching certification[b] (X_7)								1.00

Note: Sex[a] : Male = 1, Female = 2; Type of Teacher Certification[b]: Traditional = 1, Alternative = 2.

Table 48

Summary Table of Bivariate Intercorrelation Between Teacher Characteristics for the Level of Teachers' Self-Efficacy on Teaching Project Construction Curriculum (n = 176)

Variables	Y_1	X_1	X_2	X_3	X_4	X_5	X_6	X_7
Level of Teachers' Self-Efficacy on Teaching Project Construction Curriculum (Y_1)	1.00	-.16	.10	.24	.07	.19	.23	.04
Sex[a] (X_1)		1.00	-.26	-.22	-.21	-.19	.09	.09
Age (X_2)			1.00	.28	.86	.12	-.15	.11
University semester credit hours earned in agricultural mechanics (X_3)				1.00	.23	.04	-.01	-.10
Years of teaching experience (X_4)					1.00	.19	-.16	.34
Student enrollment in school-based agricultural education programs (X_5)						1.00	.05	.14
Average number of hours spent weekly supervising student agricultural mechanics SAE projects (X_6)							1.00	-.13
Type of teaching certification[b] (X_7)								1.00

Note: Sex[a] : Male = 1, Female = 2; Type of Teacher Certification[b]: Traditional = 1, Alternative = 2

Table 49

Summary Table of Bivariate Intercorrelation Between Teacher Characteristics for the Level of Teachers' Self-Efficacy on Teaching Oxy-Gas and Other Cutting/Welding Processes Curriculum (*n* = 168)

Variables	Y_1	X_1	X_2	X_3	X_4	X_5	X_6	X_7
Level of Teachers' Self-Efficacy on Teaching Oxy-Gas and Other Cutting/Welding Processes Curriculum (Y_1)	1.00	-.08	.12	.24	.09	.02	.02	-.04
Sex[a] (X_1)		1.00	-.24	-.21	-.19	-.21	.09	.08
Age (X_2)			1.00	.27	.84	.11	-.15	.14
University semester credit hours earned in agricultural mechanics (X_3)				1.00	.25	.04	.00	-.08
Years of teaching experience (X_4)					1.00	.18	-.16	.34
Student enrollment in school-based agricultural education programs (X_5)						1.00	.04	.13
Average number of hours spent weekly supervising student agricultural mechanics SAE projects (X_6)							1.00	-.14
Type of teaching certification[b] (X_7)								1.00

Note: Sex[a] : Male = 1, Female = 2; Type of Teacher Certification[b]: Traditional = 1, Alternative = 2

Table 50

Summary Table of Bivariate Intercorrelation Between Teacher Characteristics for the Level of Teachers' Self-Efficacy on Teaching Woodworking Curriculum (n = 120)

Variables	Y_1	X_1	X_2	X_3	X_4	X_5	X_6	X_7
Level of Teachers' Self-Efficacy on Teaching Woodworking Curriculum (Y_1)	1.00	.04	.07	.22	.02	-.07	-.03	-.13
Sex[a] (X_1)		1.00	-.18	-.21	-.13	-.16	.02	.14
Age (X_2)			1.00	.25	.88	.12	-.14	.18
University semester credit hours earned in agricultural mechanics (X_3)				1.00	.18	.05	-.05	-.20
Years of teaching experience (X_4)					1.00	.15	-.16	.32
Student enrollment in school-based agricultural education programs (X_5)						1.00	.10	.10
Average number of hours spent weekly supervising student agricultural mechanics SAE projects (X_6)							1.00	-.18
Type of teaching certification[b] (X_7)								1.00

Note: Sex[a] : Male = 1, Female = 2; Type of Teacher Certification[b]: Traditional = 1, Alternative = 2

Table 51

Summary Table of Bivariate Intercorrelation Between Teacher Characteristics for the Level of Teachers' Self-Efficacy on Teaching Metals Curriculum (n = 136)

Variables	Y_1	X_1	X_2	X_3	X_4	X_5	X_6	X_7
Level of Teachers' Self-Efficacy on Teaching Metals Curriculum (Y_1)	1.00	-.08	.11	.17	.10	.12	.04	.01
Sex[a] (X_1)		1.00	-.11	-.15	-.07	-.21	.13	.13
Age (X_2)			1.00	.28	.85	.07	-.18	.11
University semester credit hours earned in agricultural mechanics (X_3)				1.00	.25	.03	-.02	-.04
Years of teaching experience (X_4)					1.00	.12	-.15	.33
Student enrollment in school-based agricultural education programs (X_5)						1.00	.08	.12
Average number of hours spent weekly supervising student agricultural mechanics SAE projects (X_6)							1.00	-.14
Type of teaching certification[b] (X_7)								1.00

Note: Sex[a] : Male = 1, Female = 2; Type of Teacher Certification[b]: Traditional = 1, Alternative = 2

Table 52

Summary Table of Bivariate Intercorrelation Between Teacher Characteristics for the Level of Teachers' Self-Efficacy on Teaching Finishing Curriculum (n = 139)

Variables	Y_1	X_1	X_2	X_3	X_4	X_5	X_6	X_7
Level of Teachers' Self-Efficacy on Teaching Finishing Curriculum (Y_1)	1.00	.05	-.01	.13	-.01	-.04	.08	.22
Sex[a] (X_1)		1.00	-.19	-.21	-.14	.08	-.20	.07
Age (X_2)			1.00	.51	.88	.16	.09	-.15
University semester credit hours earned in agricultural mechanics (X_3)				1.00	.43	.04	.09	.01
Years of teaching experience (X_4)					1.00	.33	.15	-.17
Student enrollment in school-based agricultural education programs (X_5)						1.00	.12	-.16
Average number of hours spent weekly supervising student agricultural mechanics SAE projects (X_6)							1.00	.06
Type of teaching certification[b] (X_7)								1.00

Note: Sex[a] : Male = 1, Female = 2; Type of Teacher Certification[b]: Traditional = 1, Alternative = 2

VITA

Philip Ryan Saucier was born on December 12, 1978, in Houston, Texas to Philip Harvey Saucier and Sharon Leigh Saucier. From an early age, Ryan had a love for agriculture and the outdoors. During his childhood, he spent many weekends and summers at the 7 Bar S Ranch in Grapeland, Texas. Whether it was working cattle, riding horses, baling hay, hunting, or helping his dad, uncles and grandfather repair farm equipment, Ryan was right there beside them. In 1997, Ryan graduated from Huntsville High School in Huntsville, Texas. After graduation, he attended Sam Houston State University in Huntsville, Texas. Throughout his bachelor and part of his master degree (4/1997 – 8/2002) , Ryan worked as a Correctional Officer and Sergeant of Correctional Officers for the Texas Department of Criminal Justice (Walls, Eastham, and Wynne Units) to fund his education.

In 2001, Ryan graduated with his Bachelor of Science in Agricultural Business and a minor in Agricultural Mechanization. After graduation, he further pursued a Master of Agriculture degree with emphasis in Agricultural Mechanization. As fortune would have it, Ryan attained a position within the Agricultural Department at Sam Houston State University as a Graduate Teaching Assistant under the direction of Dr. Billy Harrell and Dr. Joe Muller. During his tenure as a Graduate Teaching Assistant, he fell in love with education. After some very inconspicuous coaxing by Dr. Billy Harrell, Ryan decided to also attain a teaching certificate in agricultural education. In May of 2004, Ryan graduated with his Masters degree and his state of Texas teaching certificate from Sam Houston State University.

From July of 2004 to June of 2007, Ryan taught agricultural education at junior high/ high schools in Wichita Falls, Texas (City View I.S.D.) and Houston, Texas (Sheldon I.S.D.). He specialized in the instruction of agricultural mechanics and spent many hours supervising student agricultural mechanics projects, training Leadership and Career Development Event teams, and supervising student S.A.E. projects. During these years, he loved his time spent as an FFA advisor and Texas Agricultural Science Teacher. His passion for agriculture, the FFA, and appreciation for higher education, inspired many of his students to become productive members of society.

In August of 2007, Ryan pursued his final educational dream of becoming a university professor and enrolled at the University of Missouri. During his time at Mizzou, he worked as a Graduate Teaching Assistant and Graduate Research Assistant for the Agricultural Education and Agricultural Systems Management programs. His research at Mizzou increased the awareness of ATV safety throughout the Midwestern United States of America and the need of agricultural mechanics education for newly certified Missouri agriculture teachers. On May 14, 2010, he graduated and earned his Ph.D. in Agricultural Education with an emphasis in Agricultural Systems Management. He was the first person in his family to earn a Doctorate of Philosophy and become a university professor.