Journal of Agricultural Education. 56(1), 6-19.
doi: 10.5032/jae.2015.01006

Does Agricultural Mechanics Laboratory Size Affect Agricultural Education Teachers' Job Satisfaction?

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Abstract

Secondary agricultural education teachers were surveyed to examine if a relationship existed between the physical attributes of agricultural mechanics laboratories and agricultural education teachers' enjoyment of teaching agricultural mechanics. Teachers also indicated their competence to teach courses other than agricultural mechanics within the agricultural education curriculum, perceived importance of Iowa agricultural education curricula, and training an agricultural mechanics Career Development Event (CDE) team. Responses were collected from 103 Iowa agricultural education teachers. It was found that shop size and the age of the shop did not have a correlation between agricultural education teachers' enjoyment of teaching agricultural mechanics, competence in other courses, importance of agricultural mechanics, or training a team to compete in the state CDE. Teachers' enjoyment of teaching agricultural mechanics was positively correlated to the size of the budget for consumables and equipment for their agricultural mechanics laboratory. Researchers recommend that further research be conducted to identify factors which motivate agricultural education teachers who teach agricultural mechanics within secondary agricultural education programs.

Keywords: job satisfaction; agricultural mechanics laboratory; agricultural education; laboratory size; Iowa

This article is a product of the Iowa Agriculture and Home Economics Experiment Station, Ames, Iowa. Project No. 3713 and sponsored by Hatch Act and State of Iowa funds.

Since the establishment of formal secondary agricultural education, learning laboratories have been an integral part of the comprehensive school-based agricultural education program's success by providing a learning-by-doing atmosphere for students (Shoulders & Myers, 2012; Sutphin, 1984). Educational laboratories are part of the overall program which consists of classroom and laboratory instruction, Supervised Agricultural Experience (SAE), and leadership development and personal growth through FFA (Dailey, Conroy, & Shelley-Tolbert, 2001; Phipps, Osborne, Dyer, & Ball, 2008). Talbert, Vaughn, Croom, and Lee (2007) suggested that by utilizing laboratories, agricultural educators can make a positive difference in students' learning by changing the quality, breadth, and depth of instruction to which they are exposed.

Rosencrans and Martin (1997) stated that a majority of Iowa secondary teachers believed stand-alone courses in agricultural mechanics were a critical component of agricultural education programs. Walker, Garton, and Kitchel (2004) found that agricultural educators enjoyed

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agricultural mechanics lab instruction and FFA leadership activities such as preparing teams for Career Development Events (CDE). Burris, Robinson, and Terry (2005) stated that in Missouri the Department of Elementary and Secondary Education identified agricultural mechanics as having the highest level of interest and enrollment of all secondary agricultural education courses. With a newfound interest in agricultural mechanics in secondary schools, it is important to prepare preservice teachers to meet the growing need of today's secondary agricultural students.

Shinn (1987) estimated that individual and group instruction within agricultural laboratories can consume one-third to two-thirds of the total instructional time of a typical agricultural education course. Laboratories are more essential for programs that teach agricultural mechanics than programs that do not teach these skills, because they provide a venue for teachers to utilize hands-on activities within a realistic setting (Phipps et al., 2008). For laboratories to be effective they need to authentically duplicate real life situations as closely as possible, contain adequate supplies, and have sufficient space for experiential learning activities (Blackburn & Kelsey, 2012; Shinn, 1987; Sutphin, 1984). Neglecting the proper supplying and maintenance of laboratories in a comprehensive agricultural education program often results in diminished quality of the total program (Newcomb, McCraken, Warmbrod, & Whittington, 2004).

Rice, LaVergne, and Gartin (2011) determined that agricultural teachers in West Virginia were more likely to continue teaching if they had "good classroom and laboratory conditions" (p. 109). Studies have shown the necessity to incorporate laboratories within agricultural education programs (Blackburn & Kelsey, 2012; Newcomb et al., 2004; Shinn, 1987; Sutphin, 1984), but does the size of the laboratory matter? National and state agricultural education classroom and laboratory recommendations have been established to allow for safe authentic experiential learning activities in agricultural mechanics laboratory. Iowa's recommendation for an agricultural mechanics laboratory is 3,200 square feet of floor space (Iowa Governor's Council on Agricultural Education, 2001). This is consistent with the national agricultural education laboratory size recommendation of at least 120 square feet of floor space per student in the largest class (Phipps et al., 2008; Talbert et al., 2007). Phipps et al. (2008) also recommended an additional 1,400 square feet be provided for permanent equipment within the laboratory. Saucier, Vincent, and Anderson (2014) found that shop size of agricultural mechanics laboratories in Kentucky met the overall size requirement set by the state, but did not meet the national recommendation for space per student. This was due to overcrowding in the classes, which could lead to a potential increase in safety hazards (Saucier, Vincent, & Anderson, 2014).

Anderson (2004) posited that if any part of the physical environment was distracting to the teacher, the effectiveness of their instructional activities may be impacted. Additionally, this could lead teachers to be less passionate about their jobs when they must utilize inadequate facilities (Uline & Tschannen-Moran, 2006). Shinn (1987) stated the quality of an agricultural education teacher's laboratory instruction directly impacts the effectiveness of the total program. Additional sources of aggravating stress factors grow from the various hazards associated with laboratory instruction. Cano (1990) stated that agricultural education teachers' ability to deliver effective instruction drew upon physical, emotional, and intellectual resources. A study by Lee (1990) identified hazards of laboratory instruction as a source of aggravating stress factors. When teaching agricultural mechanics an agricultural education teacher may feel intellectually inferior, which could lead to potential stress and ineffective instruction may result.

Davis and Wilson (2000) stated that teacher motivation to remain in the teaching profession was directly linked to job satisfaction and job stress. The availability of funding for updating and maintaining facilities was a motivational factor that influenced agricultural educators to continue teaching in West Virginia (Rice et al., 2011). Woods and Weasmer (2002) stipulated that budget constraints often negatively impact a teacher's job satisfaction. According to Warner and Washburn (2009) the problem with school funding is not a new issue. Funding has been identified as a continual problem within the agricultural education profession (Connors, 1998; Stewart, Moore, & Flowers, 2004). Stewart et al. (2004) posited that finance and budgets are a primary concern of leading educators in the United States. Furthermore, with a disproportion amount of funding in public schools, students in rural areas are not receiving a high quality of education (Stewart et al., 2004).

Grady (1985) found that the school setting and school enrollment did not have an effect on an agricultural educator's overall job satisfaction. When considering an agricultural educator's enjoyment of teaching agricultural mechanics, would the demographics of the laboratory such as school setting, enrollment, laboratory size, age, and budget have any effect on satisfaction? Would an inadequate laboratory compound these stressors and affect an agricultural education teacher's job satisfaction?

Burris et al. (2005) stated that secondary agricultural mechanics courses include a variety of content areas which indicates agricultural mechanics is a broad area of study. With such a variety of content areas, are teacher preparation programs able to prepare competent preservice agricultural teacher candidates? Teacher educators from 69 institutions rated their preservice teacher candidates' competence lower than their indicated level of importance of agricultural mechanics competence (Burris et al., 2005). Preservice teacher programs might be teaching areas of agricultural mechanics for which they have appropriate resources and not others, which leads to unprepared graduates entering the profession (Burris et al., 2005). This study will investigate if inadequate supplies, the size of agricultural mechanics laboratories, and a teacher's self-perceived competence in agricultural mechanics have an effect on their enjoyment of teaching agricultural mechanics?

Theoretical Framework

Herzberg's motivator-hygiene or two-factor theory has been widely used to connect job satisfaction/dissatisfaction to human motivators (Foor & Cano, 2011; Robertson & Smith, 1985). Herzberg (1966) posited that humans have two sets of needs that are independent from each other. The factors are broken into two categories: Hygiene factors and motivation factors. Hygiene factors are extrinsic factors related to an occupation, which relate to conditions that affect job performance (Lundberg, Gudmundson, & Andersson, 2009). These factors include supervision, salary, physical working conditions, company policies, job security, and relations with others. Hygiene factors are linked to job dissatisfaction. Herzberg, Mausner, and Snyderman (1959) postulated that hygiene factors were related only to job dissatisfaction and would not affect job satisfaction.

The second set of factors identified in Herzberg's (1966) motivator-hygiene theory is labeled as motivational factors. Motivational factors were considered intrinsic within the occupation and deal with personal growth needs of the person (Lundberg et al., 2009; Herzberg et al., 1959). Motivational factors are aspects of an occupation that an individual has the ability to change and includes promotion, personal growth, achievement, recognition, and responsibility. Only when these factors are satisfied will job satisfaction increase (Lundberg et al., 2009; Herzberg et al., 1959). Motivational factors tend to come from prolonged job experiences, where hygiene factors are derived from short-term job experiences (Pinder, 1984).

Herzberg's motivation-hygiene theory has been criticized, although it has been widely recognized for evaluating job satisfaction. One such criticism claims that several hygiene factors can increase job satisfaction. These factors include salary, working conditions, and job related relationships (Lundburg et al., 2009; Pinder, 1998). Another criticism that has been posited is that the research conducted by Herzberg hasn't supported the idea of two independent factors: Motivators and hygiene (Foor & Cano, 2011; Lundberg et al., 2009; Steers & Porter, 1991). Despite these criticisms, Steers and Porter (1991) suggested that continually modifying this theory will lead to a more comprehensive and accurate list of factors to identify job satisfaction. With this study, the researchers will examine Iowa agricultural education teachers' perceptions of the physical working conditions in agricultural mechanics laboratories in hope of identifying specific aspects that effect job satisfaction.

Purpose and Objectives

The purpose of this study was to describe the average physical characteristics of agricultural mechanics programs in Iowa secondary agricultural education programs. Also, the study sought to describe the perceived importance, enjoyment, and competence of teaching agricultural mechanics classes. This study also intended to describe the relationship between the size of the agricultural mechanics laboratory and an agricultural education teacher's perceived levels of competence, importance, and enjoyment of teaching agricultural mechanics content. This research aligns with the American Association for Agricultural Education's National Research Agenda Priority Area three: Sufficient scientific and professional workforce that addresses the challenges of the 21st century (Doerfert, 2011, p. 9). Within Priority Area three researchers considered the need to develop "models, strategies, and tactics that best prepare, promote, and retain new professionals who demonstrate content knowledge, technical competence, moral boundaries, and cultural awareness coupled with communication and interpersonal skills" (Doerfort, 2011, p. 9).

The following objectives were identified to address the purposes of this study.

1) Determine the average agricultural mechanics program as measured by presence of laboratory facilities, agricultural mechanics Career Development Event (CDE) participation, location of school, age of agricultural mechanics laboratory, size of agricultural mechanics laboratory, budget allotments, number of teachers, and number of students.
2) Determine relative enjoyment of teaching agricultural mechanics classes through perceived importance of agricultural mechanics classes, and competence in teaching agricultural mechanics classes as perceived by Iowa agricultural educators.
3) Examine if a relationship exists between the physical attributes of laboratory size and relative enjoyment of teaching agricultural mechanics classes, perceived importance of agricultural mechanics classes, competence in teaching agricultural mechanics classes, and participation in state Agricultural Mechanics CDE.

Methods

This descriptive study used survey research methods to summarize characteristics, attitudes, and opinions to accurately describe a norm (Ary, Jacobs, & Sorensen, 2010). This is a portion of a larger study that used a researcher-modified, paper-based questionnaire to address the objectives of the study. The instrument comprises three sections. Section one included 54 specific agricultural mechanics skills that were separated into five constructs that included mechanic skills, structures/construction, electrification, power and machinery, and soil and water. Section two consisted of 15 demographic questions related to the teacher's education, enjoyment, and teaching background. The third section included nine questions regarding the teacher's program and school characteristics. Respondents were asked to use a five-point summated-rating scale throughout the instrument to rate their perceived personal competence level in teaching specific agricultural mechanics skills as well as their enjoyment of teaching agricultural mechanics. The scale consisted of *very strong, strong, moderate, some, no need*. Content validity was determined by a team of five university faculty members with expertise in the fields of agricultural mechanics and agricultural education. Following the suggestions of Dillman, Smyth, and Christian (2009), the initial electronic version of the instrument was pretested through a pilot study with a group of twelve agricultural teachers in a nearby state. Suggestions from the pilot study led researchers to adopt a paper-based instrument, rather than electronic. Researchers utilized a *post hoc* reliability estimate using Cronbach's alpha coefficients for competency ($\alpha = 0.97$) and enjoyment ($\alpha = 0.69$) following the suggestions of Gliem and Gliem (2003).

Data were collected in the summer of 2011 at the Iowa agricultural education teachers' conference. This population was purposively targeted because of the respondents' likelihood to be involved in annual professional development activities because they chose to attend the Iowa agriculture teacher's conference. Researchers distributed a questionnaire to each secondary instructor (N = 130) in attendance and requested that the instrument be completed by the end of the conference. A power tool institute safety curriculum was used as an incentive for completing and returning the questionnaire. A total of 103 usable instruments were received through these efforts achieving a 79.2% response rate. No further effort was made to obtain data from non-respondents. Non-response error was addressed following the suggestions of Miller and Smith (1983) by comparing respondents' personal and program demographic data to data from the Iowa Department of Education (2010). A Pearson's χ^2 analysis yielded no significant differences *($p > .05$)* for gender, age, highest degrees held, years of teaching experience, or size of school community between respondents and the general population of agricultural teachers in Iowa. Since the targeted population was purposively selected, data from this study should not be extrapolated beyond those sampled. Data were coded and analyzed using JMP Pro Version 9.0.0.

Descriptive statistics were used for objectives one and two to illustrate the different aspects of agricultural mechanics laboratories in Iowa. Frequencies and percentages were used, as well as the mean, median, standard deviation, minimum, and maximum values. The Spearman rho calculation was utilized because data was ranked (Ary et al., 2010) to identify possible correlations between the physical laboratory attributes to enjoyment, competence, importance, and training an agricultural mechanics CDE team.

Results

The purpose of objective one was to describe the average characteristics of agricultural education programs that incorporate an agricultural mechanics laboratory. Respondents (91.3%, *n* = 94) indicated a presence of an agricultural mechanics laboratory in the program. Nearly 42% (*n* = 43) of the agricultural education teachers indicated that they had trained a team to participate in the Iowa State FFA Agricultural Mechanics Career Development Event (CDE). A majority of the respondents' agricultural education programs were located in rural communities (population under 5,000) as shown in Table 1.

Table 1

Agricultural Mechanics Laboratory Demographics For Iowa Agricultural Education Programs

Item	*f*	%
Does your school have an agricultural mechanics laboratory? (*n* = 103)		
Yes	94	91.3
No	9	8.7
Have you trained a team to participate in the Iowa State Agricultural Mechanics CDE? (*n* = 103)		
Yes	43	41.7
No	60	58.3
How would you describe the location of your school? (*n* = 101)		
Rural (population under 5,000)	80	77.7
Small Urban (5,000 - 20,000)	19	18.4
Urban (20,000+)	2	1.9

Table 2 reports the frequencies and percentages of responses regarding agricultural mechanics laboratory attributes in terms of age, square footage, budget, number of student utilizing the laboratory, and the number of teachers within the agricultural education program. The average agricultural mechanics laboratory in Iowa was just under 27 years of age and consisted of 2557.80 square feet. The age of agricultural mechanics laboratories ranged from one to 60 years of age

Table 2

Attributes of Agricultural Mechanics Laboratories in Iowa Agricultural Education Programs

	n	*Min.*	*Max.*	*M*	*SD*	*Mdn.*
Age of laboratory (in years)	84.00	1.00	60.00	26.87	16.10	30.00
Size of agricultural mechanics laboratory in square feet	71.00	100.00	10000.00	2557.80	2036.39	2000.00
Agricultural mechanics consumable budget for 2010-2011?	61.00	$50.00	$6000.00	$1071.72	$1295.05	$750.00
Agricultural mechanics equipment budget for 2010-2011?	53.00	$5.00	$5000.00	$820.94	$1071.46	$500.00
Number of agricultural education teachers currently teaching at the school	101.00	1.00	4.00	1.13	0.48	1.00
Currently enrolled students in agricultural education program	97.00	12.00	225.00	83.46	45.36	80.00

Agricultural mechanics laboratory budgets identified by the respondents for consumables and equipment were similar. The annual consumable budget of the respondents ranged from $50 to $6,000. The equipment budget ranged from a minimum of $5 to a maximum of $5,000. The mean for the two budgets ranged from $800 and $1,100 respectively. The average agricultural education program in Iowa has one agricultural education teacher, but the maximum number of teachers in a program was four. This explains the large difference in the number of students enrolled within Iowa agricultural education programs. The average number of students enrolled was 83.46, and ranged from 12 to 225 students.

Objective two sought to describe agricultural education teachers’ perceptions regarding enjoyment of teaching, competence in teaching, and importance of agricultural mechanics to Iowa’s agricultural education curriculum. The results are reported in Table 3. A majority of agricultural education teachers (66%, n = 68) indicated they had a strong or very strong level of enjoyment when teaching agricultural mechanics courses. Conversely, 53.9% (n = 55) of agricultural education teachers felt more competent teaching courses within the agricultural education curriculum other than agricultural mechanics. Even though respondents felt more confident teaching other areas within the agricultural education curriculum, 84.4% of the respondents believed that agricultural mechanics was an important part of Iowa’s agricultural education curriculum.

Table 3

Teacher perceptions about enjoyment, competence, and importance of agricultural mechanics

	No need	Some	Moderate	Strong	Very Strong
	f(%)	*f (%)*	*f (%)*	*f (%)*	*f (%)*
I enjoy teaching Agricultural Mechanics courses. (*n* = 103)	6(5.8)	13(12.6)	16(15.5)	26(25.2)	42(40.8)
I feel more competent in teaching other courses in my curriculum than I do teaching Ag Mechanics. (*n* = 102)	10(9.8)	20(19.6)	17(16.6)	25(24.5)	30(29.4)
I feel that Ag Mechanics is an important part of Iowa's Agricultural Education Curriculum. (*n* = 103)	2(1.9)	2(1.9)	12(11.7)	31(30.1)	56(54.4)

The purpose of objective three was to describe the relationship between the physical attributes of an agricultural mechanics laboratory and the enjoyment, competence, and perceived importance of teaching agricultural mechanics. The interpretations of effect size of the Spearman Rho correlational relationship were based on Hopkins descriptions as outlined by Kotrlik and Williams (2003) and are as follows: .00 to .10 – very small; .10 to .30 – small; .30 to .50 – medium; .50 to .70 – large; .70 to .90 – very large; and .90 to 1.00 – nearly perfect (Kotrlik & Williams, 2003). The age and size of an agricultural mechanics laboratory did not have a significant correlation with any aspect of enjoyment, competence, importance, or CDE participation as seen in Table 4.

Table 4

Spearman Rho Correlational Relationships between Enjoyment, Competence, Importance, and CDE Participation; and Physical Attributes of Iowa Agricultural Mechanics Programs and Facilities

Item	1.	2.	3.	4.
I enjoy teaching Agricultural Mechanics courses. (*n* = 103)	-	-.634*	.542*	.278*
I feel more competent in teaching other courses in my curriculum than I do teaching Agricultural Mechanics. (*n* = 102)	-.634*	-	-.298*	-.233*
I feel that Agricultural Mechanics is an important part of Iowa's Agricultural Education Curriculum. (*n* = 103)	.542*	-.298*	-	.102
I have trained a team to participate in the state agricultural mechanics CDE. (*n* = 103)	.278*	-.233*	.102	-
How would you describe the location of your school? (*n* = 101)	.080	-.137	-.036	.063
What is the age in years of your agricultural mechanics laboratory? (*n* = 84)	.018	-.215	-.066	-.086
What is the size in square feet of your agricultural mechanics laboratory? (*n* = 71)	.055	-.134	.193	.009
What is your agricultural mechanics consumable budget for 2010-2011? (*n* = 61)	.294*	-.196	.336*	.076
What is your agricultural mechanics equipment budget for 2010-2011? (*n* = 53)	.309*	-.137	.329*	-.054
How many Agricultural Education teachers currently teach in your school? (*n* = 101)	.040	-.012	.119	.076
How many students are currently enrolled in your Agricultural Education program? (*n* = 97)	.147	-.069	-.028	.246*

Note. Item 1 – Enjoyment, 2 – Competence, 3 – Importance. Items 1 through 3 – 1 = *no need*, 2 = *some need*, 3 = *moderate*, 4 = *strong*, 5 = *very strong*.
Item 4 – 0 = no, 1 = yes. Location of school – 1 = rural, 2 = small urban, 3 = urban. * indicates significance. $p < .05$.

There was a statistically significant relationship found between the enjoyment of teaching agricultural mechanics courses and the importance of agricultural mechanics as part of Iowa's agricultural education curriculum. In addition, a positive statistically significant correlation was found between enjoyment of teaching agricultural mechanics and preparing an agricultural mechanics CDE team to compete at the state level. A positive correlation was also present between the level of enjoyment of teaching agricultural mechanics and the size of the agricultural mechanics budgets. When examining the statement *I feel more competent in teaching other courses in my curriculum than I do teaching agricultural mechanics,* negative correlations were found. These negative correlations were with enjoyment of teaching agricultural mechanics; feeling agricultural mechanics is important part of the curriculum in Iowa, and training a state agricultural mechanics CDE team.

A positive correlation was found between the importance of agricultural mechanics to Iowa agricultural education curriculum and budgets for consumables and equipment. Conversely, there was no correlation found between the importance of teaching agricultural mechanics and training a team to compete in the state CDE. Although, having trained a team for the state agricultural mechanics CDE did have a positive correlation with the number of student enrolled in an agricultural education program. The location of the school and number of teachers in a program did not reveal any significant correlations to enjoyment, competence, importance or CDE participation.

Conclusions and Discussion

The first objective sought to describe the demographic information of the average agricultural mechanics program in Iowa. The average agricultural mechanics laboratory was found in a rural setting, approximately 27 years old, and contains approximately 2500 square feet. This is 700 square feet below the recommendation for agricultural mechanics laboratory in Iowa (Iowa Governor's Council on Agricultural Education, 2011). It can be concluded that several agricultural mechanics laboratories in Iowa are in need of updating and renovation to make them meet today's safety regulations. Saucier et al. (2014) suggested that without adequately sized and safe working conditions, agricultural mechanics laboratories may lead to more accidents and reduced learning opportunities for the students using them.

The total budget for the average agricultural mechanics laboratory was $2,000, when both budgets for consumables and equipment were combined. It can be concluded that an operational budget of $2,000 is small when looking at the quantity and price of consumables needed to complete agricultural mechanics projects. With budget constraints, programs are not able to keep adequate supplies on hand for experiential laboratory activities (Blackburn & Kelsey, 2012; Shinn, 1987; Sutphin, 1984). Saucier et al. (2014) stated that working with a reduced budget may lead to the agricultural educator cutting out selected safety items or choose to use cheaper versions of safety equipment. This could lead to the teacher neglecting the laboratory resulting in a lower quality program (Newcomb et al., 2004). If teachers are forced to work with such budget constraints, they could become dissatisfied in their job (Woods & Weasmer, 2002) and lead to job dissatisfaction (Herzberg et al., 1959). Teachers that continue to use unsafe equipment and have inadequate space place students in a potentially dangerous situation and if accidents occur the agricultural education teacher could possibly be held liable in a lawsuit for professional negligence (Saucier et al., 2014).

The purpose of objective two was to describe the perceived enjoyment of teaching agricultural mechanics. Researchers found that a majority of agricultural education teachers enjoyed teaching agricultural mechanics, and thought agricultural mechanics was an important component of the Iowa agricultural education curriculum. This reinforces the findings of Walker et al. (2004) who found teachers enjoyed agricultural mechanics instruction. On the other hand, a majority of the agricultural education teachers perceived themselves to be more competent to teach other courses within the curriculum than they perceived their confidence in agricultural mechanics. Burris et al. (2005) found that teacher educators across the nation rated their program graduates as somewhat prepared for seven out of the nine agricultural mechanics competency groups and poorly prepared in another. This study identified that Iowa agricultural educators believed agricultural mechanics is enjoyable to teach but the teachers are not prepared well enough to teach agricultural mechanics as well as other agricultural content areas.

Objective three examined the relationship between the size and age of the agricultural mechanics laboratory with various aspects that pertained to teaching agricultural mechanics competencies. The data indicated that the size and age of the laboratory did not affect agricultural education teacher enjoyment of teaching agricultural mechanics. It can be speculated that agricultural education teachers who enjoy teaching agricultural mechanics will utilize the laboratory regardless of age or size to teach agricultural mechanic content. The findings from this study contradict Uline and Tschannen-Moran's (2006) findings that teachers could become less passionate about their jobs when they utilize inadequate facilities.

Further, researchers concluded that training an agricultural mechanics team for state level CDE's had a positive correlation to the number of student enrolled in the agricultural education program. Another conclusion was that enjoyment of teaching agricultural mechanics is tied to the agricultural mechanics budget available for consumables and equipment. This reinforces the findings that teachers enjoy teaching agricultural mechanics (Walker et al., 2004) and having a budget to update and maintain facilities is a motivational factor to continue teaching (Rice et al., 2011). With an improvement to the physical working conditions an individual may experience less job dissatisfaction (Herzberg et al., 1959). When an agricultural educator enjoys teaching this may lead to an increase in motivational factor, physical working conditions, thus increasing job satisfaction (Herzberg et al., 1959). Also, when an agricultural educator is able to maintain and improve facilities, this may increase the hygiene factor of physical working conditions further lowering job dissatisfaction (Lundberg et al., 2009). This begs the question, do agricultural educators enjoy teaching agricultural mechanics because they have a large budget or do agricultural educators allocate more funding for agricultural mechanics because they enjoying teaching agricultural mechanics?

From the data researchers concluded that Iowa agricultural educators were more competent in teaching content areas other than agricultural mechanics. Although teachers felt more comfortable teaching other content areas, teachers did support the notion that agricultural mechanics is important to Iowa's agricultural education curriculum. Also, the agricultural education teacher that was more competent in areas other than agricultural mechanics usually did not train a team for the state CDE. One plausibility is that a teacher who did not receive post-secondary training in agricultural mechanics is not competent enough to teach agricultural mechanics. This leads to the underutilization of the instructional laboratory and not training a team for the state CDE, which could also lead to a diminished quality of the total agricultural education program (Newcomb et al., 2004). Conversely, agricultural education teachers who think agricultural mechanics is an important part of Iowa's agricultural education curriculum does not necessarily translate to training a team for the state agricultural mechanics CDE.

Recommendations

Conclusions from this study lead to several recommendations. First, we recommend that the agricultural education teachers in Iowa continue utilizing FFA CDE's to help prepare secondary agricultural students. With an increase in student enrollment in secondary agricultural mechanics courses, increasing competence is critical for preservice agricultural teacher candidates in order to teach agricultural mechanics. With this increased need for agricultural mechanics competence, teacher preparation programs need to convey the importance of learning agricultural mechanics to the preservice agricultural teacher candidates.

Secondary agricultural education teachers should also use the state and national recommendations to decrease the number of students per laboratory section, thus reducing the issue of overcrowding which creates a more hazardous environment. With inadequately sized laboratories, teacher preparation programs need to incorporate experiential activities to educate preservice agricultural educators on how to utilize undersized laboratories safely and effectively. This will create graduates that are more informed and able to justify improvements to an existing agricultural mechanics laboratory to create and maintain a safe learning environment. By creating a safe learning environment through creating more space for students and updating equipment, the amount of accidents within an agricultural mechanics laboratory may help reduced. The improvement to an agricultural educator's physical working conditions may lead to less job dissatisfaction (Herzberg et al., 1959). In-service workshops are recommended for current agricultural educators so that they can be informed of state and national standards for agricultural mechanics laboratory and how to use them in order to ensure safe learning environments.

We also recommend that future studies be conducted to further examine the agricultural mechanics purchasing habits and budget allocations of secondary agricultural educators based on the relationship found between the agricultural budgets and educators enjoying agricultural mechanics. The funding sources of secondary agricultural education programs also needs to be examined to determine if programs are receiving funds from Carl D. Perkins, school system, FFA chapter, national, federal, local, or private business sources. The data gathered could bring insight to appropriate allocations for agricultural mechanics laboratory budgets. Further understanding of how agricultural education teachers handle funding and purchasing will help agricultural teacher preparation programs prepare preservice teaching candidates by showing how to allocate a budget to successfully implement an agricultural education program. Instruction in program finances could be used to help post-secondary agricultural educators persuade local administration for a better program budget further enhancing experiential learning activities for the students.

An examination of current preservice teacher programs is needed to explain why agricultural educators feel more competent to teach areas other than agricultural mechanics. Burris et al. (2005) stated that this problem underscores the fact that teacher educators need to continue to include agricultural mechanics in teacher preparation programs. Research into strategies to incorporate more agricultural mechanics into teacher preparation programs is imperative to meet this growing need. With increasingly stringent graduation requirements, new and innovative ways to incorporate agricultural mechanics are needed at the post-secondary level.

Another recommendation is that local advisory committees and teachers utilizing agricultural mechanics laboratories routinely evaluate the local laboratory against the appropriate state and national recommendations for agricultural mechanics laboratories. After the agricultural mechanics laboratory evaluation, recommendations should then be made to the school district to address the safety and size inadequacies. This will ensure agricultural mechanics laboratories will be safe for secondary students to learn agricultural mechanics competencies.

A few questions were raised knowing that agricultural mechanics laboratories operate with small budgets. Does the teacher decide how much of the budget to allocate to agricultural mechanics or does the agricultural mechanics budget stand-alone from the rest of the program budget? Is this amount available every year to the agricultural mechanics program or is this on a rotation? Does being on a rotation hinder a program because they do not receive funding every year, or does this make the agricultural education teacher more cognizant of their program planning and finances?

We recommend completing a follow-up study looking further into the motivations of agricultural education teachers to teach agricultural mechanics. The researchers have concluded that the majority of respondents perceive that agricultural mechanics is important to Iowa's agricultural education curriculum; therefore researchers need to examine why other agricultural educators do not perceive agricultural mechanics as important. Understanding this paradigm could lead to suggestions to improve secondary and post-secondary agricultural education programs, which could ultimately lead to a higher quality state agricultural education curriculum.

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