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School-Based Agricultural Education Teachers' Importance to Teach Agricultural Mechanics: A Gender Comparison

Dr. Ryan Anderson
Texas State University
r_a461@txstate.edu

Dr. Thomas H. Paulsen
Morningside University
paulsent@morningside.edu

Abstract
Agricultural mechanics is one of the most widely taught courses in School-Based Agricultural Education programs and is considered among the most useful courses taught (Herren, 2015). Although trends towards female equity are present with mid-career teachers (Burris, et al., 2010; Blackburn, et al., 2015), this study sought to identify if differences in the perceived importance in agricultural mechanics curriculum by male and female instructors existed. A census study of Iowa SBAE teachers was implemented at a statewide annual conference using a written questionnaire to ascertain the study's objectives. The purpose of this study was to determine Iowa SBAE teachers' perceived level of the importance of teaching agricultural mechanics by gender. Of the five constructs presented on the questionnaire, the least important construct identified by men rated higher than the most important construct identified by women. Findings support that previously reported gender inequalities in agricultural mechanics still seem to exist. However, similarities for highly rated constructs such as safety skills and traditional welding skills were identified by both male and female SABE teachers. It is interesting to note that tractor overhaul was rated as one of the least important skills in the power & machinery skills construct. This is particularly interesting considering the popularity of the FFA tractor restoration competitions at the county and state fairs in Iowa. Is there a correlation between high-school agricultural mechanics instructors' importance to teach the power and machinery construct and the popularity of the FFA tractor restoration project area? Further research is warranted in this and related areas. Considerations for specific gender-based training is worth consideration.

Introduction
A study by Dailey et al. (2001) reported that school-based agricultural education (SBAE) teachers believe students transfer and apply knowledge gained from formal learning experiences to their day-to-day lives. Much of this knowledge is gained through hands-on learning in classroom and laboratory-facilitated learning. According to Shinn (1987) and Byrd, et al. (2015), approximately one-third to two-thirds of agricultural mechanics instruction is spent in agricultural mechanics laboratories.

The majority of agricultural mechanics content is taught in both classroom and laboratory settings of school-based agricultural education programs. Agricultural mechanics is one of the most widely taught courses and has also been identified among the most useful(Herren, 2015) in school-based agricultural education programs. Shoulders and Myers (2013) found 76.8% of SBAE teachers in the United States had access to a mechanics laboratory facility and were utilizing the available facility 90.6% of time. A large portion of agricultural mechanics instruction takes place in the agricultural mechanics laboratory (Johnson, et al., 1990). Thus, students are spending a greater portion of their agricultural mechanic instruction in laboratories than the classroom setting.

According to Watson, et al. (2015), an agricultural mechanics laboratory allows tremendous opportunities for educational adult-youth partnerships. Students are more likely to be engaged and build a relationship with their instructor while working in an agricultural mechanics laboratory if the relationship is student-led (Watson, et al., 2015). Additionally, Mart (2013) indicated that teachers, regardless of subject, found commitment as one of the most critical factors for continued success in students' education; and additionally, teachers who are passionate believe in the importance of their job. Further, teachers can play a pivotal role in the transfer of knowledge to students (Mart, 2013) which begs the question, does a teacher's perceived importance of the content taught positively impact students' learning?

Of the nine construct areas of agricultural mechanics investigated by Burris, et al. (2005) agricultural mechanics teacher educators from each of the 88 agricultural teacher education certifying institutions in the United States reported that electricity, metal fabrication, hand/power tools, agricultural power, building construction, project planning and materials selection, plumbing, concrete, and machinery and equipment, were considered *Important* on a 5-point scale. More recently, Schultz et al. (2014) reported that Iowa SBAE teachers rated 34 of 54 agricultural mechanics skills as *Important* or *Very Important* on a 5-point Likert-type scale.

A demographic profile study of female SBAE teachers in the United States reported 39.6% of their time was spent on agricultural mechanics subject matter (Foster, 2003). Female SBAE teachers in Georgia reported being neutral about their gender as a barrier in regards to acceptance by others in the profession. Further, it was found that females were satisfied with their careers and felt accepted by students, administrators, parents of students, and the community (Ricketts, et al., 2006). Kelsey (2007) found 64% of women experienced gender bias but were able to overcome gender bias with high self-efficacy in teaching secondary agricultural education.

Agricultural education instructor population in the United States until recently has been predominately male with a ratio of just under 3:1 (Lawver, 2018) with a trend moving towards more female SBAE teachers entering the profession.. More women are seeking to enter the profession, although according to Foster (2003), "...artificial barriers based on attitudinal bias often prevent qualified women from reaching their potential" (p. 384). Dillingham, et al. (1993) indicated equity had not been achieved between male and female agricultural mechanics instructors, but the number of women who chose to teach agricultural mechanics over other agricultural education courses started to trend towards equity with male instructors. Overcoming gender-role stereotypes continue to be a challenge for female SBAE teachers (Baxter et al., 2011); however, despite barriers, women have created a trend towards equity in agricultural education teaching positions by entering the profession. Whittington and Raven (1995) indicated 42% of students majoring in agricultural education in the Northwest United States were female. Burris, et al. (2010) reported fifth year SBAE teachers in Texas were 2:1 between male and female teachers. Further, Burris, et al. (2010) reported first year SBAE teachers were nearly equally distributed between genders. However, in the past five years, the number of female teachers entering the profession has increased from 61% (Foster, et al., 2015) to 74% (Foster et al., 2019). Although recent trends suggest female equity in SBAE is being achieved, are there differences in perceived importance between male or female teachers when considering their perceived level of the importance of agricultural mechanics coursework in the curriculum?

Theoretical Framework

The theoretical framework guiding this study is Ajzen's (1991) Theory of Planned Behavior—an extension to Ajzen's (1975) Theory of Reasoned Action. The theory suggests that a person's behavioral attitude, environmental subjective norms, and perceived behavioral controls influence their behavioral intention resulting in the performance of an actual behavior. Specifically, one's perceived importance is shaped based on attitudes, subjective norms, and perceived behavioral control towards a subject.

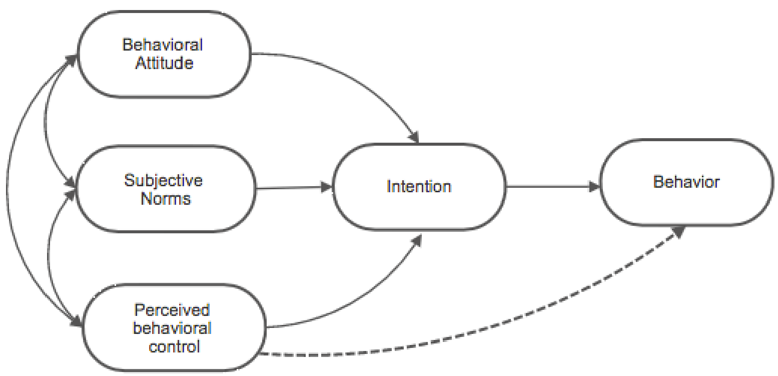

Figure 1. Theory of Planned Behavior, (Ajzen, 1991)

Defined by Ajzen (2006), attitude is measured as a level or degree of how the behavior is positively or negatively valued; it is determined by behavioral beliefs; and attitudes vary by person. Subjective norms are influenced by environmental social pressure and determined by normative beliefs (Ajzen, 2006). The third influential component is the perceived behavioral control. This is in regard to an individual's belief of available resources and opportunities needed to carry out the behavior (Madden, et al., 1992). Behavioral intentions are comprised of attitudes, subjective norms, and perceived behavioral control. Together these intentions represent the ability or capability to perform the actions (Ajzen, 2006).

The Theory of Planned Behavior can be contextualized as the SBAE teacher's behavioral attitude towards agricultural mechanics as their perceived level of importance. The theory explains that behavioral actions are reflected by the behavioral attitude, subjective norms, and perceived behavioral control. These foundational pieces, as suggested by the theory, are what create or evolve the perceived importance of an instructor to teach agricultural mechanics. Importance may be influenced in behavioral attitude and how it is positively or negatively valued by the instructor. Importance may also be determined by behavioral beliefs and may vary by person, or as in this study, may vary by gender.

Purpose and Objectives

The purpose of this study was to describe differences between SBAE teachers' perceived level of importance of teaching agricultural mechanics by gender. This study aligns with Priority Area 3: Sufficient Scientific and Professional Workforce That Addresses the Challenges of the 21st Century of the American Association for Agricultural Education's (AAAE) National Research

Agenda (NRA) (Roberts, et al., 2016) which described the priority for evaluation of competencies "needed to effectively educate, communicate, and lead" (p. 31). Further, Roberts, et al. (2016) inquired in priority number three: "[w]hat competencies are needed for an agriculture and natural resource workforce" (p. 31). When considering recent equity gains by females populating SBAE (Foster et al., 2019) questions of programmatic implementation remains, and as such, guide the following objectives of this study:

1) Determine the self-perceived importance of school-based agricultural education teachers to teach agricultural mechanics by gender.
2) Identify gender differences associated with the school-based agricultural education teachers' perceived importance to teach agricultural mechanics.

Methods

A descriptive research methodology was used to summarize the characteristics of SBAE teachers' perception of the importance to teach agricultural mechanics. This study specifically analyzed participants' perceived level of importance to teach 54 agricultural mechanics skills condensed into five constructs. The researchers utilized a modified, paper-based, questionnaire for the purposes of this study. The paper-based instrument contained three sections. The first section contained 54 selected agricultural mechanics related skills by construct. The construct areas included Mechanics Skills, Structures/Construction, Electricity, Power and Machinery, and Soil and Water. Utilizing a five-point summated rating scale, respondents were asked to rate the 54 agricultural mechanics skills in regard to their perceived level of importance to teach each skill. The options for selection ranged from 'no-need' to 'very strong need'. The second section contained 15 demographic questions related to the agricultural education teacher. The third section consisted of nine questions related to the demographics of the agricultural education teacher's program and school.

A team of five university faculty members with expertise in the fields of agricultural mechanics and agricultural education determined that the content within the instrument was valid for measuring the objectives of this study. Following the suggestions of Dillman, et al. (2009), the initial electronic version of the instrument was pretested through a pilot study with a group of twelve SBAE teachers in a nearby state. Suggestions from the pilot study led researchers to adopt a paper-based, rather than electronic instrument. Instrument reliability was established following the suggestions of Gliem and Gliem (2003) and resulted in acceptable reliability coefficients for competency per construct. *Post hoc* analysis was conducted to examine the construct validity of the instrument. From the analysis, the reliability coefficients were determined for the mechanics, structures/construction, electricity, power and machinery, and soil and water. Overall, the findings show that all the constructs were reliable. Mechanics, r=0.95; structures, r=0.93; electricity, r=0.94; power and machinery, r=0.97, soil and water, r=0.87. Four of the constructs had an excellent reliability ($r > 0.9$); whereas one construct has a good reliability ($r > 0.8$). Construct coefficients are displayed by construct in Table 1.

Table 1

Reliability Coefficients for Importance by Construct Area

Construct Area	Mechanics	Structures/ Construction	Electricity	Power and Machinery	Soil & Water

Importance	0.95	0.93	0.94	0.97	0.87

Note: >.9 – excellent, >.8 – good, >.7 – acceptable, >.6 – questionable, >.5 – poor, <.5- unacceptable (Gliem & Gliem, 2003)

Data were collected from SBAE teachers who attended the Iowa agricultural education teachers' conference through a census study (*N*=130). This audience was purposely targeted because of the ease of having respondents in one place for a given amount of time and the teachers' likelihood to be involved in annual professional development activities. During the conference a print-based survey was distributed to the participants. Each participant was offered a power tool institute safety curriculum as an incentive for completing and returning the questionnaire. This yielded a response rate of 79.2% as 103 of the 130 surveys were returned. With 103 completed questionnaires, the researchers deemed that the census study was large enough to yield some stability in the results (Ferber, 1977). However, to avoid non-response bias and other sampling problems the researchers elected to address non-response error by following the suggestions of Miller and Smith (1983). A Pearson's $\chi 2$ 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 SBAE teachers in Iowa. Data were analyzed using SPSS Statistics 24.0, descriptive statistics (frequencies, percentages, and grand means) were calculated for each of the five constructs. However, due to the nature of this census study, findings should be interpreted with care so as not to extrapolate beyond the target population.

In this study, the average male SBAE teacher (n = 69) was 42 years old, held a bachelor's degree, and had taught for 18 years. The average male teacher completed two agricultural mechanics courses at a four-year university through a traditional teacher training program. The average female SBAE teacher in this study (n = 34) was under 30 years old, had obtained a bachelor's degree, and had taught for less than nine years. The average female teacher completed one agricultural mechanics course in a traditional four-year university teacher training program. Table 2 identifies demographic frequencies by gender.

Table 2

Iowa Secondary Agricultural Teachers Demographic Characteristics

	Males		Females	
Demographic Characteristics	*f*	%	*f*	%
Age				
20-29	16	23.5%	18	52.9%
30-39	16	23.6%	14	41.2%
40-49	8	11.7%	0	0%
50-59	23	33.8%	2	2.9%
60-69	4	5.9%	0	0%
70+	1	1.5%	0	0%
Years taught				
0-9	22	31.9%	27	79.4%
10-19	16	23.2%	6	17.7%
20-29	13	18.8%	1	2.9%
30-39	17	24.7%	0	0%

40+	1	1.4%	0	0%
Alternatively Certified				
Yes	17	25.0%	16	48.5%
No	51	75.0%	17	51.5%
Highest Level of Education				
Bachelor's	42	60.8%	22	64.7%
Master's	27	39.2%	12	35.3%
Trained an Ag Mechanics CDE team				
Yes	33	48%	10	30%
No	36	52%	24	70%

Results

Objective one sought to determine if Iowa SBAE teachers' perceived level of importance to teach agricultural mechanics differed by gender. Table 3 identifies the construct grand means and standard deviations of the perceived level of importance of agricultural mechanics skill constructs by gender. For each construct, males indicated a higher perceived level of importance than did females. The power and machinery construct had the largest mean difference (*MD* = 1.23) between male (*M* = 3.50) and female teachers (*M* = 2.27).

Table 3

Grand Means of Secondary Agricultural Teachers Perceived Importance by Gender by Construct Area

	Males		Females	
Importance Construct	*M*	*SD*	*M*	*SD*
Mechanics	3.15	1.02	2.28	1.06
Structures and Construction	3.76	0.97	2.78	1.24
Electricity	3.04	1.08	2.07	1.13
Power and Machinery	3.50	1.04	2.27	1.23
Soil and Water	2.85	0.95	2.38	1.11

Note. Scale 1 = not important, 2 = slightly important, 3 = moderately important, 4 = important, 5= very important.

Objective two sought to identify the difference between gender and perceived level of importance to teach agricultural mechanics skills within each construct. For example, the mechanics construct consisted of skills related to metalworking, welding, fencing, plumbing, and computer aided design (Table 2). The largest difference was in the skill area of fencing (Table 4) shows female teachers (*M* = 3.15) rating the importance higher than male teachers (*M* = 3.67). The second highest competency difference was in: oxy-acetylene welding with males (*M* = 3.94) ranking importance higher than females (*M* = 3.65); male teachers ranked GTAW welding (TIG) higher than female teachers, (*M* = 3.60 to *M* = 3.89, respectively); while the difference in computer-aided design, saw male teachers (*M* = 3.47) ranking the skill higher than females (*M* = 3.18). Female SBAE teachers identified Oxy-propylene, TIG, Metallurgy, Tool Conditioning, Soldering, and Mechanical Safety as more important than their male counterparts.

Table 4

Means of Secondary Agricultural Teachers Perceived Importance by Gender by Mechanics Skills

	Male			Female		
Competency Area	*n*	*M*	*SD*	*n*	*M*	*SD*
Oxy-Acet. Welding	68	3.94	0.896	31	3.65	1.253
Oxy-Acet. Cutting	68	4.21	0.839	32	4.03	0.999
Oxy-Propylene Cutting	54	3.19	1.375	27	3.26	1.163
Plasma Cutting	59	4.15	0.943	30	4.07	1.143
SMAW Welding (Arc)	67	4.34	0.827	31	4.29	1.039
GMAW Welding (MIG)	64	4.34	0.859	31	4.23	1.055
GTAW Welding (TIG)	57	3.60	1.100	27	3.89	1.121
Welding Safety	67	4.75	0.682	32	4.63	0.976
Metallurgy & Metal Work	58	3.17	1.078	28	3.25	1.110
Hot Metal Work	56	3.09	1.164	27	2.89	1.050
Cold Metal Work	56	3.13	1.161	27	2.96	1.126
Tool Conditioning	55	3.25	`1.265	28	3.36	1.193
Oxy-Acet. Brazing	63	3.44	1.147	31	3.19	1.108
Computer-Aided Design	53	3.47	1.137	28	3.18	1.124
Soldering	61	3.34	1.138	29	3.41	1.086
Pipe Cut. & Thread	54	3.20	1.188	28	3.11	1.197
Plumbing	56	3.46	1.235	29	3.31	1.039
Fencing	55	3.15	1.325	27	3.67	1.240
Mechanical Safety	63	4.25	1.031	28	4.29	1.150

Note. Scale 1 = not important, 2 = slightly important, 3 = moderately important, 4 = important, 5= very important.

The structures/construction construct encompasses skills that include operating woodworking equipment to planning of woodworking projects (Table 5). The competency with the largest mean difference (*MD* = 0.52) between male (*M* = 4.12) and female teachers (*M* = 3.83) was the woodworking hand tools competence. The second highest mean difference (*MD* = 0.25) was in woodworking power tools between males (*M* = 4.32) and females (*M* = 4.07). Female SBAE teachers identified Selection of Materials, Bill of Materials, and Construction and Shop Safety as more important than their male counterparts.

Table 5

Means of Secondary Agricultural Teachers Perceived Importance by Gender by Structures/Construction Skills

	Male			Female		
Competency Area	*n*	*M*	*SD*	*n*	*M*	*SD*
Woodworking Hand Tools	66	4.12	0.937	30	3.83	0.913
Woodworking Power Tools	66	4.32	0.947	30	4.07	0.828

Drawing and Sketching	60	3.90	1.003	27	3.67	0.784
Concrete	61	3.72	1.051	27	3.56	0.934
Selection of Materials	63	3.98	0.907	28	4.21	0.738
Bill of Materials	65	4.20	0.971	28	4.21	0.833
Fasteners	62	3.77	1.093	27	3.63	1.006
Construction Skills (Carpentry)	64	4.03	1.054	28	3.86	0.803
Construction and Shop Safety	65	4.40	0.844	29	4.59	0.682

Note. Scale 1 = not important, 2 = slightly important, 3 = moderately important, 4 = important, 5= very important.

The electricity construct competencies were related to safety, residential wiring, and electrical motors is displayed in Table 6. The competency with the largest mean difference (*MD* = .51) between males (*M* = 4.03) and females (*M* = 3.52) was with the wiring skills competency. The second highest competency mean difference (*MD* = .33) was in electrician tools between males (*M* = 3.85) and females (*M* = 3.52). Female SBAE teachers identified Type of Electrical Motors more important than their male counterparts.

Table 6

Means of Secondary Agricultural Teachers Perceived Importance by Electricity Skills by Gender

	Male			*Female*		
Competency Area	*n*	*M*	*SD*	*n*	*M*	*SD*
Electricity Controls	59	3.63	1.113	30	3.50	1.167
Wiring Skills	62	4.03	1.071	29	3.52	1.090
Electrician Tools	61	3.85	1.046	29	3.52	1.090
Type of Electrical Motors	58	3.36	1.238	29	3.38	1.208
Cleaning Motors	55	3.33	1.277	28	3.32	1.156
Electrical Safety	60	4.22	1.091	29	4.14	1.093

Note. Scale 1 = not important, 2 = slightly important, 3 = moderately important, 4 = important, 5= very important.

The power and machinery construct included competencies related to small engines, tractors, machinery, and safety and is reported in Table 7. The competency with the largest mean difference (*MD* = .51) between males (*M* = 4.08) and females (*M* = 3.57) was with the small engine overhaul competency. The second highest competency mean difference (*MD* = .33) was in small engine services – 4 cycle between males (*M* = 4.11) and females (*M* = 3.79). The third highest competency mean difference (*MD* = . 28) was in small engine services – 2 cycle between males (*M* = 3.97) and females (*M* = 3.69). Female SBAE teachers identified Tractor Selection, Tractor Operation, Tractor Safety, Tractor Driving, and Power & Machinery Safety as more important than their male counterparts.

Table 7

Means of Secondary Agricultural Teachers Perceived Importance by Power & Machinery Skills by Gender

	Male			*Female*		
Competency Area	*n*	*M*	*SD*	*n*	*M*	*SD*
Small Engine Services – 2 cycle	61	3.97	0.948	29	3.69	1.228
Small Engine Services – 4 cycle	62	4.11	0.925	28	3.79	1.166
Small Engine Overhaul	60	4.08	0.996	28	3.57	1.168
Small Engine Safety	62	4.32	0.845	28	4.29	0.937
Tractor Service	59	3.69	1.087	26	3.42	1.238
Tractor Maintenance	58	3.79	1.104	27	3.63	1.149
Tractor Overhaul	57	3.33	1.155	27	3.07	1.072
Tractor Selection	55	3.31	1.120	27	3.33	1.240
Tractor Operation	57	3.42	1.133	27	3.44	1.155
Tractor Safety	59	3.90	1.155	27	4.07	1.238
Tractor Driving	58	3.47	1.203	27	3.59	1.309
Service Machinery	58	3.57	1.011	27	3.48	1.252
Machinery Selection	57	3.46	1.036	27	3.44	1.188
Machinery Operation	58	3.48	1.096	27	3.48	1.156
Power & Machinery Safety	60	3.97	1.104	27	4.04	1.344

Note. Scale 1 = not important, 2 = slightly important, 3 = moderately important, 4 = important, 5= very important.

The soil and water construct included competencies related to precision agriculture, surveying, and legal land descriptions is displayed in Table 8. The competency with the largest mean difference (*MD* = .24) between male (*M* = 4.05) and female teachers (*M* = 3.81) was with the legal land descriptions competence. The second highest competency mean difference (*MD* = .21) was in profile leveling between males (M = 3.06) and females (M = 3.27). Female SBAE teachers identified all skills except Legal Land Descriptions as more important than their male counterparts.

Table 8

Means of Secondary Agricultural Teachers Perceived Importance by Soil & Water Skills by Gender

	Male			*Female*		
Competency Area	*n*	*M*	*SD*	*n*	*M*	*SD*
Global Positioning Systems	60	4.18	0.873	30	4.33	0.959
Use of Survey Equipment	60	3.65	1.071	29	3.72	1.099
Differential Leveling	53	3.19	1.194	26	3.38	1.134
Profile Leveling	53	3.06	1.117	26	3.27	1.218
Legal Land Descriptions	61	4.05	0.939	31	3.81	1.167

Note. Scale 1 = not important, 2 = slightly important, 3 = moderately important, 4 = important, 5= very important.

Conclusions and Recommendations

Objective one sought to determine Iowa SBAE teachers' perceived level of importance to teach 54 agricultural mechanics skills through five construct skill areas by gender. We conclude that inequalities among gender in agricultural mechanics exist. We also found that male teachers identified four constructs as mostly important and one construct as somewhat important while female teachers identified all constructs as slightly important. Female SBAE teachers further identified structures and construction (*M*=2.78) as the most important construct whereas the least important construct identified by male teachers was soil and water (*M*=2.85). It is important to note that the least important construct identified by male teachers, was higher than the most important construct identified by female teachers.

This study does not answer the question of why male SBAE teachers perceive a higher level of importance than female SBAE teachers in the teaching of agricultural mechanics. Recommendations for future research include implementing qualitative studies to evaluate the perceived importance from both male and female SBAE teachers. Similar recommendations follow Harrison, et al. (1993) in promoting a positive image among colleagues to increase outcomes for the female educators in relation to the agricultural mechanics program.

Although male and female respondents in our study identified the importance of the constructs differently, the theme of safety within constructs was identified as highly important by both genders. Four out of six safety skills were identified as the highest; the remaining two safety skills were rated highly as well. These findings align with Saucier, et al.'s (2014) research supporting the conclusion that safety skills are critically important in agricultural mechanics laboratory settings. Further, we recommend pre-service and in-service SBAE education programs be used as tools for continued education in safety (Saucier, at el., 2014) so that continued support of high importance is maintained from agricultural mechanics instructors.

Objective two sought to identify the difference between gender and perceive level of importance to teach agricultural mechanics skills within each construct. In the welding construct, all respondents identified the traditional welding skill areas as the most important to teach in SBAE programs. Male teachers identified GMAW welding (MIG) the highest; closely followed by female teachers in SMAW welding (Arc). School-based agricultural educators are still dedicated to the hands-on learning approach. The emerging areas of computer-aided design and plasma cutting are behind the traditional skills. In the soil and water construct, the skill of global positioning systems was identified as the highest by both genders. Will we see a change of importance in curriculum as the agricultural mechanics industry changes with technology? Recommendations include follow-up studies in the skills related to technology in agricultural mechanics.

While both male and female SBAE teachers reported both GMAW and SMAW welding as some of the most important skills, it should be noted that one of the least important skills identified was metallurgy and metal working. This leads the researchers to ponder why SBAE teachers in this study viewed welding as important, yet tend to be leaning away from the scientific approaches by not recognizing metallurgy as important? Further, both male and female teachers identified hot and cold metal work as two of the least important skills reported. This leads the researchers to ponder if those skills are viewed as outdated or should be left to industrial technology education programs.

In the skill area of structures and construction, male SBAE teachers identified hand and power tools as highly important while female teachers identified selection and bill of materials as highly important. Male teachers identified the tools needed, where female teachers identified the planning as highly important. In the electricity construct similarities among male and female teachers occurred. Both genders identified wiring skills as highly important with electrician tools close to follow. In this construct, learning the skills was more important than learning the tools needed to perform the skills. Can school-based agricultural mechanics skills, *the doing,* be taught prior to the knowledge *of tools needed* or do the teachers view teaching tools not as important as teaching the skills because the students will learn about the tools while they learn the skills? If students do not have the proper tools, can they learn the proper skills? Further research in the discrepancy between the importance of tools and skills should be pursued (McCubbins, et al., 2016).

Both genders identified 2- and 4-cycle small engine services as highly important. Both genders also identified the small engine overhaul skill area as important. It should be interesting to note that tractor overhaul was rated as one of the least important skills in the power & machinery skills construct. This is particularly interesting considering the popularity of the FFA tractor restoration competitions at the county and state fair level in Iowa. Is there a correlation between high-school agricultural mechanics instructors' perceived level of importance to teach the power and machinery construct and the popularity of the FFA tractor restoration project area? Further research is warranted in this and related areas. The researchers recommend the findings of this study be shared with agricultural education teacher preparation programs in support that teachers continue to receive the proper education for agricultural mechanics.

Further research to determine SBAE teachers' behavioral intentions (Madden, et al., 1992) should be implemented to determine the underlying variables associated with the gender differences found in this study related to the perceived level of importance of various agricultural mechanics competencies. Once identified, specific attitudes and subjective norms that lead towards perceived behavior control could be integrated into preservice educational curriculum as well as into in-service training related to agricultural mechanics. Once in place, this should further establish gender equity into the implementation of one of the "the most useful courses taught" in agricultural education (Herren, 2015).

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