

A Need for Mechanization Training for Pre-Service Teachers

Hannah Bailey
University of Georgia
#405 College Station
Athens, GA 30602
706-542-8913

Don W. Edgar
University of Georgia
#405 College Station Rd
Athens, GA 30602
706-583-0225

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Introduction/Need for Innovation

There has been an increased demand for agriculture teachers at both the middle and high school level, yet in 2017 only 74.5% of license-eligible agriculture teachers were planning to teach at graduation (Smith, Lawver, & Foster, 2018). A common feeling from pre-service teachers is that they do not consider themselves experts in agriculture content and feel they lack basic knowledge in multiple content areas upon graduation. Not only is agriculture content knowledge a concern, but also application of teaching the content (Rice & Kitchel, 2015). Many universities with agriculture education programs require classes that focus specifically on content knowledge gain. These classes often omit essential components like transferability and application allowing pre-service teachers to move content understanding to a level where they can instruct (Rice & Kitchel, 2015). A pre-service teacher program should first focus on the teaching and learning process while considering student experiences therefore being more impactful than the course itself (Myers & Dyer, 2004). Based on these findings a question could determine if courses focused on teaching content knowledge through methods that mimic what would be used in a future classroom in degree related courses, what are the effects for future teacher candidates?

One area, agriculture mechanics, is where teachers have indicated a high need for training (Smalley, Hainline, & Sands, 2019). It has been further purported that many students starting an agriculture teacher education program do not possess the most basic assets in agriculture mechanics, making training even more essential (Blackburn, Robinson, & Field, 2015). Coinciding, teacher educators believe agriculture mechanics is important for pre-service teachers, showing a requirement for proper preparation (Burriss, Robinson, & Terry, 2005). For beginning teachers, burnout is more common if they feel unaccomplished from a lack of skills (Friedman, 1996). Therefore, if teacher candidates lack experience and confidence towards topics in agriculture mechanics, ascertain that understanding and educating in a different manner might ease these perceptions and positively impact efficacy levels of teacher candidates. Therefore, the implementation of teaching candidates in a way not commonly utilized could garnish insight and help programs justify proper training and methods impacting candidates.

Methodology

Pre-service teachers enrolled in an introductory agricultural mechanics course in the Fall of 2018 at the University of Georgia were surveyed at the beginning and end of the semester regarding their knowledge, confidence, and previous level of experience on fifteen different mechanization topics. Students rated, from one to five, with one indicating no experience or no confidence and five indicating much experience or highly confident on a previously developed instrument. The course, *Agriculture Education Lab Methods*, covers basics of several agriculture mechanics topics and content is taught through lessons practical for a middle or high school setting. Results to date, only finalized data from Fall of 2018 with Fall 2019 data currently being collected, are presented. The next phase of the project will include data analysis of Fall 2019, comparisons between 2018 and 2019 data will be accomplished, and the impact of various teaching methods in agriculture mechanics will be determined.

Results to Date/Implications

Current results, from Fall 2018, show an increase in level of knowledge for fifteen different agriculture mechanic subject areas, after formally being taught and ensuing demonstrations. Not only did level of knowledge increase, but so did students' confidence level regarding ability to teach the material in a classroom. Participants with a reduced amount of previous knowledge and experience had a larger increase in knowledge and confidence for that specific subject. Therefore, there is a need to structure agriculture education programs to better prepare pre-service teachers in the area of agriculture mechanics (Burriss, Robinson, & Terry, 2005). This is specifically true for pre-service teachers with little to no experience in agriculture mechanics because of the gain in both knowledge and confidence.

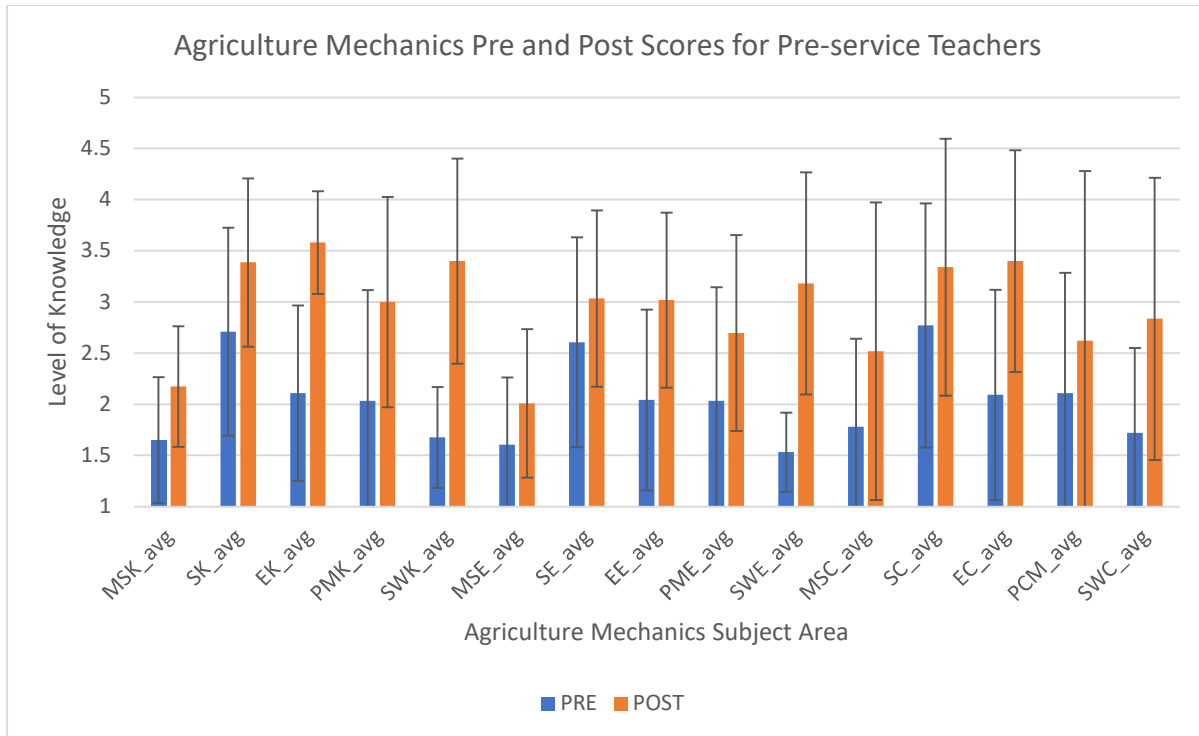


Figure 1. Graph indicating Means and Standard Deviations of pre and post knowledge scores.

Future Plans/Costs/Resources

Continued data collection of pre-service agriculture teachers enrolled in Agriculture Education Lab Methods will help increase sample size and scope. After examining the impact an agriculture mechanics course has on pre-service teachers' knowledge and confidence, a comparison of teaching methods will be performed, determining possible effective approaches for subject knowledge gain and the application of teaching in classrooms. If a similar course is offered in agricultural education programs, implementing the innovated educational practice can be done at no to little cost. Assimilated into an existing course, no additional resources may be needed. Although technology has impacted society abundantly in recent years, learning to do and doing to learn are still cornerstones in agricultural education with practical application still permeating programs throughout the nation.

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