

**Assessing the Perceived Needs of Pre-Service Agricultural Educators at the Beginning of an  
Agricultural Mechanics Course**

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### Introduction and Theoretical Framework

Agricultural mechanics is a top area of needed professional development for in-service teachers (Wells & Hainline, 2021; Wells et al., 2021). Effective post-secondary instruction which meets the perceived needs of future teachers can equip them to teach agricultural mechanics in the future, and feel more confident providing safe, industry-relevant experiences for their students (Saucier & McKim, 2011). The purpose of this study was to identify the top perceived needs of pre-service agricultural educators enrolled in an agricultural mechanics course. The study was guided by two objectives: 1) to determine overall perceived needs within each construct area and 2) to identify the top 10 competency needs. Our work was guided by Ajzen’s (1991) theory of planned behavior; teachers with greater confidence and more positive attitudes about a topic are more likely to implement their learning, and more willing to teach agricultural mechanics.

### Methods

A census of 30 students enrolled in the course in fall 2025 engaged in this IRB-approved study. Needs were identified following the Borich (1980) model. Clark et al.’s (2021) instrument was used; each of the constructs in the instrument received Cronbach’s alphas between 0.907 and 0.976, indicating high reliability (Nunnally, 1978). Mean weighted discrepancy scores (MWDS) evaluated perceived importance of a competency against the perceived ability to perform the competency. High MWDS values suggest greater needs for training and support (Borich, 1980).

### Findings

The MWDS compared the top needs among pre-service teachers in the 54 competencies within five constructs. Among the five constructs, the top areas of need were electricity ( $\mu = 10.01$ ;  $\sigma = 0.20$ ) and power ( $\mu = 7.87$ ;  $\sigma = 2.38$ ), followed by soil and water ( $\mu = 7.19$ ;  $\sigma = 0.65$ ), agricultural mechanics and fabrication ( $\mu = 6.97$ ;  $\sigma = 1.14$ ), and agricultural structures ( $\mu = 6.61$ ;  $\sigma = 1.40$ ). Further, the top 10 competency needs among the 54 on the instrument are presented in Table 1.

**Table 1:** *Top 10 Competency Needs Among Pre-Service Teachers*

Competency	Construct	MWDS	I	A
Cleaning motors	Electricity	10.32	4.30	1.90
Using electrician tools	Electricity	10.20	4.37	2.03
Demonstrating electricity controls	Electricity	9.96	4.27	1.93
Demonstrating electrical safety	Electricity	9.92	4.80	2.73
Using different types of electrical motors	Electricity	9.87	4.17	1.80
Demonstrating wiring skills (switches and outlets)	Electricity	9.81	4.33	2.07
Demonstrating tractor operation	Power	9.24	4.33	2.20
Demonstrating small engine service and repair (4-cycle)	Power	9.22	4.13	1.90
Demonstrating tractor service and repair	Power	9.10	4.20	2.03
Demonstrating construction skills	Structures	9.02	4.23	2.10

*Note.* Importance (I) and ability (A) were evaluated on a 5-point scale, with 1 being “not at all important” or “no ability” and 5 being “extremely important” or “strong ability.”

### Discussion and Conclusions

Pre-service teachers perceive the greatest needs in electricity and power; nine of the top 10 competencies also were represented in these constructs. This aligns with Clark et al. (2021) and Saucier and McKim’s (2011) work, which revealed key needs in areas such as safety, electricity, and equipment operation. Teachers who build their perceived behavioral control (Ajzen, 1991) in these areas have greater potential to teach these important skills (Leiby et al., 2013). Future research should investigate if these findings change during the course. Further, these findings should inform the prioritization of curriculum within pre-service agricultural mechanics courses.

## References

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