Novice agriculture teacher content knowledge among traditional and alternatively certified teachers: A longitudinal comparison

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Introduction/Need for research

Agriculture teacher demand is at an all-time high due to program growth, expansion, retirements, and new program openings. In 2018, there were over 1,000 agricultural education positions left unfilled (Deimler et al., 2019). Alternatively certified teachers are becoming more common with chronic teacher shortages, with 1 in 3 new agriculture teachers entering the profession as uncertified or not completing a traditional certification program (Roberts & Dyer, 2004; Smith et al., 2022). How do the needs of new agriculture teachers prepared in certification programs differ from those who did not receive the same preparation? The purpose of this study was to compare the skill readiness level of Missouri beginning agriculture teachers who were traditionally certified to those without traditional certification.

This inquiry was guided by the following research objectives:

1. Describe the beginning agriculture teacher skill readiness in agriculture content, SAE and FFA knowledge, instruction and curriculum knowledge, program planning and management for first year traditional and alternatively certified teachers.
2. Compare the content knowledge of beginning agriculture teachers who remained in the profession for their second year to those who were not retained.
3. Compare 2021 novice cohort readiness with 2004 cohort readiness.

Conceptual or theoretical framework

This study was guided by Barrick and Garton's (2010) conceptual model of teacher preparation. Strong content knowledge is an essential component of teaching (Bransford et al, 2000, Schulman, 1987), and both alternatively and traditionally certified teachers historically complete foundational coursework in agricultural content area(s). According to Barrick and Garton (2010), agriculture teacher preparation includes content knowledge, pedagogical content knowledge, and skills and professional knowledge and skills. This inquiry attempts to illuminate how formal training in pedagogical and professional knowledge and skills are expressed in the confidence in various aspects of the tasks required of a beginning agriculture teacher.

Methodology

This was a descriptive quantitative study utilizing survey research methods. The target population for this research was first year agriculture teachers. The accessible population was first year agriculture teachers currently employed in Missouri. Researchers replicated Roberts & Dyer's (2004) study on inservice needs of traditional and alternatively certified teachers, utilizing the same instrument and scale to generate descriptive data for longitudinal comparison in agriculture content, FFA and SAE, instruction and curriculum, and program management and planning. This instrument was developed through previously constructed instruments by Garton and Chung (1996) and Washburn et al. (2001). After receiving IRB approval, researchers contacted all first-year agriculture teachers in the state directory via email with a link to a google form containing a survey where teacher identified their preparation level to perform or teach selected agricultural education skills and topics. Prior to distribution, the survey was reviewed by a panel of experts for face and content validity and for readability. Roberts and Dyer estimated reliability of each construct at or above $\alpha = 0.88$. Like the Roberts and Dyer study, researchers collapsed responses of one and two into "*high need"* and reported frequencies. Initial surveys were distributed in December. Non respondents were emailed twice in December and once in January. A total of 22 usable responses were obtained with a response rate of 45%. Findings should not be inferred beyond the respondents.

Results/findings

Table 1- Mean (standard deviation) for novice agriculture teacher skill readiness in various constructs.

	2021 novice teachers		2004 novice teachers	
	Traditional (*n = 16)*	Alternative (*n* = 6)	Traditional (*n* =70)	Alternative (*n* = 72)
Instruction and curriculum	3.49 (1.18)		3.15 (0.86)	
	3.58 (1.06)	3.24 (1.20)	3.15 (0.86)	2.98 (0.87)
Technical agriculture	3.05 (1.26)		3.11 (0.64)	
	3.13 (1.22)	2.75 (1.27)	3.11 (0.64)	3.09 (0.86)
Program planning and management	2.83 (1.24)		3.18 (0.94)	
	2.82 (1.18)	2.83 (1.37)	3.18 (0.94)	3.10 (1.02)
FFA and SAE	2.81 (1.22)		3.06 (0.85)	
	2.88 (1.23)	2.63 (1.21)	3.06 (0.85)	3.06 (0.92)

Note: Items scaled as *1=not prepared, need much assistance, 5=fully prepared*

Table 2- Mean (standard deviation) agriculture teacher skill readiness of first year agriculture teachers retained compared to leaving the profession

Constructs	Retained in profession *n* = 19	Leaving *n* = 3	Mean Difference
FFA and SAE content	2.99 (1.18)	1.61 (1.22)	1.38
Instruction and curriculum	3.65 (1.08)	2.32 (1.18)	1.33
Program planning and management	2.96 (1.22)	2.00 (1.24)	0.96
Technical agriculture	3.17 (1.22)	2.32 (1.26)	0.85

Note: Items scaled as *1=not prepared, need much assistance, 5=fully prepared*

Conclusions

In areas of technical agriculture content, FFA and SAE, and Instruction and Curriculum, the 2021 traditionally certified teachers, on average, scored higher than the alternative certified teachers at a similar level of +0.33 for all scales. For alternatively certified teachers in this study, 50% of respondents reported they were not prepared to complete proficiency awards, Program of Activities, FFA Degrees. Fifty percent of traditional and alternative teachers reported they were not prepared to lead Adult programming. Compared to 2004 teachers, 2021 novice teachers felt more prepared in curriculum and instruction, but lower on all other constructs. Teachers retained for a second year reported higher skill levels across all four areas for both traditional and alternatively certified teachers. Mean content differences of more than one scale point were found between leavers and stayers was in FFA and SAE content and instruction and curriculum.

Implications/Recommendations/impact on the Profession

This study supports the importance of content knowledge as a key component of teacher success. Beginning teachers felt most prepared in instruction and curriculum development and technical content. This could reflect curricular trends to increase education coursework and reduce content classes. Alternatively certified teachers reported a lack of preparation in the FFA and SAE. The study also brings to light the variation within “alternative” certification. This study supports the breadth of skills needed by agriculture teachers and suggests great importance of perceived content knowledge in retention of beginning agriculture teachers. As programs identify, recruit, and prepare alternatively certified teachers, teacher leaders should focus on confidence in the content as a potential predictor of retention in the profession. We recommend beginning teacher programs identify and support teachers who identify low content knowledge.

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