Analyzing the Sources of Knowledge and Pedagogical Content Knowledge of SBAE Teachers by Licensure Type

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Introduction/Need for Research

With attrition rates on the rise and an influx of novice and alternatively certified (AC) teachers entering the profession, it has become imperative to assess the knowledge base of school-based agricultural education (SBAE) teachers and their pedagogical abilities (Rice & Kitchel, 2015). While possessing content knowledge is important, communicating that knowledge effectively to students is what makes a quality teacher (Okpala & Ellis, 2005). Quality teachers possess high levels of Pedagogical Content Knowledge (PCK). PCK is one of the most influential pieces of teacher knowledge and is critical to teacher development (Baumert et al., 2010; Loughran et al., 2012). PCK is a culmination of Common Content Knowledge, Horizon Content Knowledge, Specialized Content Knowledge, Knowledge of Content and Students, Knowledge of Content and Teaching, and Knowledge of Curriculum (Hill et al., 2008). PCK research has aided in creating a picture of what teachers do when teaching and has further established that content knowledge alone does not make an individual qualified to teach (Rice & Kitchel, 2018). Outside of SBAE, the science and math fields have indicated deficiencies in the PCK of teachers (Ball et al., 2008; Halim & Meerah, 2002). To support a new wave of SBAE teachers entering the profession, identifying their knowledge base and PCK is crucial.

Theoretical Framework and Literature Review

Self-efficacy, a concept first developed by Albert Bandura, postulates that human achievement depends on the individual's experiences (Bandura, 1977). The more an individual is exposed to something, the more confident they become in their abilities to address it. Related to teaching, research shows that teachers with high levels of self-efficacy are more open to new methods of teaching, challenge themselves more, and exhibit greater confidence in planning, solving problems, and seeking assistance (Lazarides & Warner, 2020).

Similarly, the development of an educator's Pedagogical Content Knowledge (PCK) coincides with Bandura's theory. Theorized by Lee Shulman (1986), PCK, in the context of agricultural education, is where educators put their content knowledge expertise to practice. Previous literature in agricultural education has studied traditionally certified (TC) and AC teachers independently, but few have examined both cohorts of teachers together. Rice & Kitchel (2018) identified a need for additional research as PCK in agricultural education has yet to be defined. Moreover, examining "what shapes PCK specifically in agriculture teachers can serve as the starting point for future PCK development studies" (p. 66). Identifying the sources of knowledge of both cohorts of teachers and their PCK will paint a clearer picture of how SBAE teachers can be better supported in the classroom.

Methodology

This study's purpose and primary objective was to describe the sources of knowledge and the differences in Pedagogical Content Knowledge by licensure type. As part of a larger descriptive relational study, the target population was all SBAE teachers from the Northeast region of the United States (NAAE Regions IV and VI) who were actively teaching during the 2021-2022 school year. During June of 2022, an online survey instrument (i.e., Qualtrics) was administered. The survey instrument for this specific analysis consisted of respondents addressing statements on sources of

knowledge and a series of statements, each linked to a PCK construct using a five-point Likert-type scale. Respondents used a unit they felt confident teaching as a frame of reference when addressing the statements related to PCK. The study was then repeated using a unit teachers felt less confident teaching. As part of a larger study, four hundred and eighty-five participants participated in the survey, with 73.6% (N = 357) identifying as TC and 28.4% (N = 128) identifying as AC.

Results/Findings

Regarding the sources of knowledge, 92.5% of TC SBAE teachers and 80.6% of AC SBAE teachers agreed or strongly agreed with the statement, "my teaching experience is a source of knowledge that has a great impact on my ability to be effective at teaching." Additionally, 73.3% of TC SBAE teachers and 85.3% of AC teachers agreed or strongly agreed with the statement, "my previous employment in agriculture is a source of knowledge that has a great impact on my ability to be effective at teaching." While some similarities exist among sources of knowledge, the two cohorts were split on their third highest source of knowledge. 74.9% of TC SBAE teachers agreed or strongly agreed with the statement, "experts within the field are a source of knowledge that has a great impact on my ability to be effective at teaching." In comparison, 75.7% of AC SBAE teachers agreed or strongly agreed with the statement, "the internet and textbooks are sources of knowledge that has a great impact on my ability to be effective at teaching."

Regarding the Pedagogical Content Knowledge of both cohorts of teachers, our findings suggest TC teachers claim to have higher Horizon Content Knowledge (M = 4.41, SD = 0.65) and Knowledge of Content and Students (M = 3.79, SD = 0.75). In contrast, AC teachers claim to have higher Common Content Knowledge (M = 4.06, SD = 0.74) and Specialized Content Knowledge (M = 3.92, SD = 0.74). Mean and standard deviation figures were determined by averaging the reported values for each trial (confident vs. not confident).

Conclusions/Recommendations/Impacts

Our findings show similarities among both cohorts of SBAE teachers concerning sources of knowledge but clear differences in PCK. Moreover, a relationship exists between licensure type and the construct areas SBAE teachers ranked more favorably. TC teachers claim to be proficient at knowing their students. This includes understanding where their students are developmentally and identifying items that will be challenging for them. Additionally, they reported proficiency in sequencing material, locating teaching resources, and designing curricula.

On the other hand, AC teachers claim to be proficient in identifying when students give incorrect answers, understand why students make certain errors in their work, and feel they can easily explain why answers are correct or incorrect.

As a result, individualized professional development would best address each cohort's content and pedagogical gaps. Doing so will help develop these teachers' self-efficacy and pedagogical content knowledge, allowing them to be more effective in the classroom. This recommendation is supported by the theories of Bandura (1977) and Shulman (1986). Additionally, state staff should work with their SBAE teachers to provide content-specific professional development for their TC teachers and professional development in pedagogical practices for their AC teachers. Finally, the researchers would like to expand this study to other parts of the United States to see if other regions would generate similar results.

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