Laboratory Instructional Needs of Oklahoma SBAE Teachers Based on Certification Type and Career Stage

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Introduction and Theoretical Framework

For years, we have seen an increase in the method of alternate certification and other methods in the school-based agricultural education (SBAE) profession (Coleman et al., 2020). These teachers are entering the field with knowledge of different areas, but no true understanding of the laboratory setting. This rise in non-traditional certification paths has led to teachers expressing concerns in their skills and abilities to teach within a laboratory setting (Wells et al., 2021). As alternative methods for entering the profession continue to rise, we see a growing need for professional development in laboratory setting education (Claflin et al., 2022). The instructional needs for different career length teachers are also facing a rising concern. These teachers are facing challenges within their respective career stages (Thorton et al., 2020). The purpose of this study was to find the level of preparedness of teachers who achieved certification through alternative methods and length of career for SBAE teachers.

This study of agricultural educators within Oklahoma was framed with the theory of human capital (Becker, 1964; Machlup, 1982) and teacher human capital theory (Myung et al., 2013). Human capital is often applied to education as it provides results which affect education and educational policy. Human capital is often applied to education as a major investment into human resources (Machlup, 1982). Myung et al. (2013) provided a framework aimed based on the original human capital theory which aims to provide a framework to have a stronger teacher workforce. To accomplish this, we must provide meaningful experiences and build the teachers' capacity to provide these experiences to the learners. The teacher capital theory is broken down into four subsystems, with three strong influence and one weak influence systems: acquire, develop, sustain, and evaluate (Myung et al., 2013).

Methodology

This study was a part of a larger research project (Rankin et al., 2023). This study included a target population of all SBAE teachers within Oklahoma (N =462). The needs assessment instrument was a questionnaire developed by Roberts and Dyer (2004) and modified by others (Coleman et al., 2020; Saucier et al. 2010) and further modified for this study. The teachers provided responses on hand-written questionnaires completed at regional FFA events. The questionnaire was returned by 338 SBAE teachers, resulting in a 73.2% response rate. The individual laboratory needs for the teachers involved within the study were assessed within two groups, career stage and certification type. These groups were further classified, with career stage divided into three groups, early career (1-7 years; n=148), middle career (8-23 years; n=136), and late career (24+ years; n=45). The certification type was split into two groups, with these groups being traditionally certified (n=266) and alternatively certified (N=61). Alternative certification encompassed all nontraditional paths (i.e., alternative, emergency, and not certified). Rank discrepancy scores (RDS) were calculated for all 19 items for the whole group and then

split between each of the five subgroups, with the reporting RDS following the ranked discrepancy model Narine and Harder (2021).

Findings

Out of the 19 items within the data, 18 of the possible 19 items resulted in a negative RDS for traditionally certified teachers. The top four discrepancies for traditionally certified teachers resulted in negative RDS in *Lab safety, Hydroponics lab, Agriscience lab, and Greenhouse*, with scores of -22.56, -20.3, -20.3 and -19.62 respectively. The bottom two discrepancies for the group were *Mechanics lab/shop and Equipment barns/shed* with scores of -0.38 and 2.26. For alternatively certified teachers, 17 of the possible 19 items resulted in a negative RDS. The groups top four discrepancies were within the areas of *Hydroponics lab, Fruit/Nut production, small gardens, and Agriscience lab* with scores of -34.43, -34.43, -29.51, and -27.87, respectively. The bottom two discrepancies for the group were *Livestock Pasture and Nursery/Shade house* with scores of 0 and 1.64. Within the career stage group, early career stage teachers (1-7 years) resulted in negative RDS in 18 out of the positive 19 items. The top four discrepancies within the group were *Hydroponics lab, Fruit/Nut production, Forestry plot, and Agriscience lab* with scores of -22.30, -20.95, -18.92, and -16.89 respectively. The bottom two discrepancies were *Teaching how to conduct scientific experiments and Equipment barns/sheds* with scores of -0.68 and 0.00. The middle career stage educators (8-23 years) resulted in a negative RDS of all 19 items. The top four discrepancies within the group were *Lab safety, Green house, Hydroponics lab, and Aquaculture lab* with scores of -30.15, -28.15, -27.94 and -27.94 respectively. The bottom two discrepancies were *Livestock Pasture and Mechanics lab/shop* with scores of -3.68 and -1.47. Late career stage teachers (24+ years) resulted negative RDS in 14 of the possible 19 items. The top four discrepancies for the group were *Agriscience lab, Fruit/Nut production, Forestry plots, and Woodworking* with scores of -28.89, -24.44, -22.22, and -17.78 respectively. The bottom two discrepancies were *Equipment barns/sheds and Livestock Pasture* with scores of 13.33.

Conclusions and Recommendations

The purpose of this study was to identify discrepancies within the groups of SBAE teachers in Oklahoma. These teachers displayed discrepancies within AFNR pathways such as Plant Systems, Natural Resources, and displayed a discrepancy within *Lab Safety.* These findings show a lack of preparation for teachers. We found through analysis that as the length of career increases, the discrepancies begin to shift. While new 21st century skills and topics are introduced to SBAE teachers, they display a lack of knowledge. This is supported by Weeks et al. (2020) with these educators describing the relevancy but describe a lack of knowledge. For these teachers, the continued use of professional development opportunities provides the framework to develop the knowledge for these skills and topics to become effective tools for SBAE (Myung et al., 2013). This study can be replicated across states to analysis the discrepancies of other SBAE teachers.

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