What Veterinary Science Professional Development Needs Do Agriculture Teachers Have? A Pilot Study

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Introduction and Theoretical Framework

To be regarded as high-quality, Agricultural Education programs in public schools must be led by qualified, effective agriculture teachers (Eck et al., 2019). Effective teachers are able to perform a range of professional responsibilities, including teaching technical agriculture subject matter (Eck et al., 2019). In the context of teaching courses in the Animal Systems career pathway, agriculture teachers need a range of technical skills (Wells et al., 2023). Agriculture teachers develop their technical skills through various means, including in-service professional development (PD) (Grieman, 2010). Agriculture teachers perceived there are benefits to engaging in additional Animal Systems career pathway-focused PD activities (Yopp et al., 2020). Consequently, we found it was prudent to undertake a data-driven approach to determining agriculture teachers' veterinary science PD needs.

We used human capital theory (HCT) to theoretically underpin our study. As noted by Becker (1993), developing individuals' (such as agriculture teachers) competence through educational opportunities (e.g., PD activities) provides useful and tangible returns for society at large, including improved opportunities to impact public school students' learning. Furthermore, enhancing the competence of agriculture teachers allows them to better address their students' learning interests and the broader needs of the agricultural industry (Wells et al., 2023).

Purpose

The purpose of our pilot study was two-fold: (1) to validate a new data collection instrument for determining agriculture teachers' veterinary science PD needs and (2) to describe Illinois agriculture teachers' veterinary science PD needs. Regarding the research values presented by the American Association for Agricultural Education (AAAE, 2023), our study aligns with the *Increasing Prosperity Through Innovation in AFNR Systems* research value.

Methods

We used Borich's (1980) needs assessment model to develop our data collection instrument. As noted by Johnson et al. (2024), Borich's (1980) model is a practical, useful tool for assessing agriculture teachers' PD needs. In alignment with Borich's (1980) model, we sought to allow prospective respondents to rate their perceived importance to teach (i.e., via the *Importance* scale) and perceived competence to teach (i.e., via the *Competence* scale) each veterinary science item that we included in our data collection instrument. We also included additional demographics-related items within our data collection instrument. Prior to initiating the data collection process, we asked three agricultural teacher educators who had each recently conducted needs assessment studies to review our instrument for face validity and content validity. We addressed their recommendations and edits accordingly. In total, our data collection instrument contained 22 veterinary science items and five teacher demographics questions. We did not report teacher demographics-related data within the current research poster abstract.

We used a census design to collect data from all 600 Illinois agriculture teachers. Per Dillman et al.'s (2014) recommendations, we used five points of contact to collect our data electronically during the Fall 2025 semester. Our emails to 32 agriculture teachers were unsuccessful, resulting in a failure rate of 5.3%. Eighty-nine agriculture teachers provided usable data, yielding a usable response rate of 15.7%. Regarding the assessment of a new questionnaire's reliability, Bujang et al. (2024) noted that obtaining data from at least 30 respondents is sufficient. We used both IBM® SPSS® Version 26.0 software and McKim and Saucier's (2011) Excel-Based Mean Weighted Discrepancy Score (MWDS) Calculator to analyze our data. We used an independent samples *t*-test to assess non-response error. We compared the responses of early- and late-respondents (Lindner et al., 2001) to the *Competence* scale items and found no statistically significant differences ($p > .05$) between the two groups. We used a post-hoc reliability analysis to assess the reliability of the two scales we used in our data collection instrument, finding that Cronbach's alpha reliability coefficients for the *Importance* scale ($\alpha = .94$) and the *Competence* scale ($\alpha = .96$) were, per George and Mallery (2003), considered excellent. We then calculated a MWDS for each of the 22 veterinary science items and used the MWDS to rank each item.

Results

The MWDS ranged from 1.27 to 7.26; 17 of the 22 items were above 3.00. All MWDS were positive, indicating that the respondents had PD needs related to all 22 items (McKim & Saucier, 2011). We noted the top five veterinary science items in Table 1 (below).

Table 1

Top Five Agriculture Teachers' Veterinary Science Professional Development Needs by MWDS

				Importance		Competence	
Item	*n*	Rank	*MWDS*	*M*	*SD*	*M*	*SD*
Properly performing cardiopulmonary resuscitation (CPR) on animals	83	1	7.26	4.24	.82	2.53	1.18
Properly taking animal vital signs	83	2	6.45	4.61	.54	3.22	.99
Properly identifying parasites	83	3	6.20	4.43	.63	3.04	1.10
Properly performing animal physical examinations	83	4	6.10	4.60	.49	3.28	.94
Properly performing first aid on animals	83	5	6.00	4.45	.69	3.10	1.04

Note. Importance Scale: 1 = *Not important* (*NI*), 2 = *Of little importance* (*LI*), 3 = *Somewhat important* (*SI*), 4 = *Important* (*I*), 5 = *Very important* (*VI*); Competence Scale: 1 = *Not competent* (*NC*), 2 = *Little competence* (*LC*), 3 = *Somewhat competent* (*SC*), 4 = *Competent* (*C*), 5 = *Very competent* (*VC*); *MWDS* = Mean weighted discrepancy score; *M* = Mean; *SD* = Standard deviation.

Conclusions and Recommendations

Our pilot study yielded a valid and reliable data collection instrument for determining agriculture teachers' veterinary science PD needs. We concluded that our respondents need additional PD pertaining to all 22 items. Regarding human capital development (Becker, 1993), Illinois Agricultural Education stakeholders should use our findings to plan and implement veterinary science PD for agriculture teachers. Our findings are not generalizable to all agriculture teachers across the country. Hence, we further plan to conduct a national-level study.

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