Student-animal interactions in AFNR education: An exploration of students' affective and cognitive responses

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Introduction

Formal, informal, and non-formal educational institutions across the United States collectively operationalize one particular educational resource to facilitate the process of acquiring knowledge and understanding: animals (Gee et al., 2015; George & Cole, 2018). Incorporating animals within agricultural, food, and natural resources (AFNR) educational settings is commonplace. Yet, there is limited research on the effect of student-animal interactions (SAI) on student attitudes, curiosity, empathy (ACE), or perceived knowledge (PK). Additionally, it is undetermined how students' past animal experiences and previous coursework affect these areas, even though they are potential moderators (Gómez-Leal et al., 2021). Research indicates that positive attitudes toward animals are associated with higher levels of humane behavior toward animals; contrariwise, negative attitudes result in lower levels of humane behavior (Serpell, 2004). As empathy and curiosity are considered significant drivers of motivation, they can inadvertently improve attitudes, foster a desire for knowledge, and act as catalysts for pro-environmental behavior change (Skupien et al., 2016; Silva dos Santos et al., 2020).

Therefore, this study aimed to explore SAI, guided by two research objectives focused on exploring the relationships between (1) students' ACE, PK, and enrollment in animal sciences coursework with or without live animals present and (2) PK and previous animal experience. Advancing the knowledge of SAI outcomes can help shape future coursework and materials to prepare school-based agricultural educators and extension educators who regularly integrate animals into educational instruction.

Theoretical Framework

The guiding frameworks for this study are the elaboration likelihood model of persuasion and experiential learning theory. The elaboration likelihood model (ELM) delineates that individuals process information through two routes to induce attitude change (Petty & Cacioppo, 1986). Attitude change through the central route relies on an individual's cognitive motivation and ability to process information. This route utilizes information-based factual approaches such as visual or verbal presentations and direct communications. In contrast, the peripheral route is prompted by environmental associations that require little cognitive processing. For example, positive or negative cues that emerge from biased content delivery. Experiential learning theory (ELT) refers to learning through experience and reflection (Kolb, 1984). Within AFNR education, experiential learning can engage both routes of persuasion. Direct hands-on contact with an animal provides an opportunity for the learner to acquire factual information (i.e., sheep have rectangular eyes) through the central route in addition to forming positive associations (i.e., the educator modeling non-fearful behavior during an animal interaction decreased fear in learners) through the peripheral route.

Methodology

Data analyzed in this study was collected through a pre-course ($N = 172$) and post-course ($N = 79$) online survey to measure changes in attitudes, curiosity, empathy, and perceived knowledge of animal species presented in animal sciences coursework. The surveys were administered to all undergraduate animal science students 18 years or older at The Ohio State University during Autumn Semester 2022. Students were recruited through virtual flyers and department list-serv emails. Individual Likert items measured attitude, curiosity, and perceived knowledge on a 5-point scale, while experience (5-point, 2-item scale) and empathy (3-point, 3-

item scale) were measured on Likert-type scales. Internal reliability for the summated Likert items of empathy and experience achieved Cronbach's alpha's of $\alpha = 0.78$ and $\alpha = 0.85$. These Cronbach's alphas are deemed acceptable for an exploratory study as they surpass the threshold of $\alpha = .60$ (Hair et al., 2010). A panel of experts ($n = 5$) composed of disciplinary fields, including animal sciences, education, and human-animal interactions, was used to establish face and content validity. All inferential and descriptive statistics were conducted through SPSS.

Results

To explore our first objective, independent t-tests were conducted to determine if there was a significant difference in the dependent variable's "attitude," "curiosity," "empathy," and "perceived knowledge" between students who had previous animal science coursework with live animals present versus without. The pre-survey and post-survey were analyzed separately for ease of comparison. Pre-survey results indicate that previous live animal coursework means for "PK" ($M = 2.64$, $SD = 0.717$) and "empathy" ($M = 2.56$, $SD = 0.524$) were statistically significant compared to the previous non-live animal coursework means for "PK" [($M = 2.26$, $SD = 0.633$; t (3.045) = -3.258, $p < 0.001$, $d = 0.547$)] and "empathy" [($M = 2.17$, $SD = 0.777$; t (4.174) = -2.961, $p < 0.004$, $d = 0.621$)]. Additional analyses conducted employing a univariate model found the covariates "attitude" and "previous animal experience" statistically significant ($p < 0.05$) at the 95% CI for both dependent variables "PK" and "empathy." Furthermore, post-survey results indicate that previous live animal coursework means for "curiosity" ($M = 4.66$, $SD = 0.626$) were statistically significant compared to the previous non-live animal coursework [($M = 3.93$, $SD = 1.086$; t (1.869) = -3.780, $p < 0.001$, $d = 0.892$)]. A univariate analysis found the covariates "attitude" and "previous animal experience" statistically significant ($p < 0.05$) at the 95% CI. To evaluate objective two, a Pearson correlation between knowledge and experience revealed a significant, substantial, positive relationship for the pre-survey ($r = .655$) and a significant, very high positive relationship for the post-survey ($r = .709$) (Davis, 1971).

Conclusions/Implications

This study aimed to build a foundation for future research on student-animal interactions. As findings indicated, previous animal science coursework can influence students' perceived knowledge, empathy, and curiosity. Experiential learning through hands-on interactions with animals can prompt information processing through the central and peripheral routes. Incorporating information-based instructional strategies with affective and environmental cues will enhance student development of lifelong skills and knowledge (Skupien et al., 2016; Ryan & Campa, 2000). Thus, with this pedagogical approach, students can acquire long-lasting attitude changes beneficial to pro-environmental behaviors (Silva dos Santos et al., 2020). Furthermore, animal-centric educational communication is an essential part of AFNR education, considering animals collectively appertain to all AFNR areas: agriculture, food, and natural resources.

While animals are used as educational resources in educational settings daily, there is a lack of research-based pedagogical frameworks that provide educators with the tools and structure needed to ensure successful implementation (Gee et al., 2015). Further investigation on integrating the elaboration likelihood model and experiential learning theory within the AFNR educational context could prove highly beneficial for educators and learners alike. The purpose of this research is to facilitate opportunities for constructive discussions with individuals from various disciplinary backgrounds and viewpoints to amalgamate collected knowledge for future SAI research.

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