

## Fostering Civic Action: Pedagogical Approaches to 6-12 Fire Science Education

Arianna Jade Villanueva, [Villaa43@unlv.nevada.edu](mailto:Villaa43@unlv.nevada.edu)  
University of Nevada, Las Vegas, College of Education  
Mentor: Dr. Merryn Cole

Nevada's increasing wildfire intensity calls for curricula bridging scientific literacy with community responsibility. Restiano et al. (2024), established co-produced curricula increase the capacity for living with fire by integrating technical, cultural, and student knowledge. However, McGranahan & Wonkka (2018) noted wildland fire science literacy is incomplete without the inclusion of human dimensions and socio-ecological elements. Our study addresses a critical gap: understanding how pre-service teachers (PSTs) translate these human dimensions into tangible civic action. We address the research questions: how can fire science lessons move students from scientific inquiry (learning) to civic action (doing)? What are the perceived benefits and challenges for a PST when integrating civic engagement and facilitating this transition? We conducted a qualitative case study using a semi-structured interview with a PST who implemented the Green Boxes in several middle school classrooms. Annie (pseudonym) defined civic engagement as community involvement and advocacy. The primary civic action identified was informing, where students created PSA posters on wildfire smoke impacts. Annie noted students were highly motivated by local references of the content, focusing on air quality and what they could "smell and breathe." However, challenges such as students' gaps in geography knowledge and limited time to build classroom rapport highlight that civic engagement requires more than just scientific facts; it requires adaptable teaching strategies. Annie reported an increase in teaching confidence through the project, moving from a self-reported "zero" to a "5/5" likelihood of implementing civic engagement in her future career. These findings suggest the study of civic pedagogy is as vital as the science itself. Successful implementation requires "contingency planning" for academic gaps and intentional strategies to build student agency. By prioritizing the human dimensions of fire science, educators can effectively prepare the next generation of Nevada's civic leaders to move beyond the classroom and into community advocacy.