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Rooted in Reflection: Early Educator Mindfulness through STEM Biology Concepts

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Abstract

This study examined the design and impact of an innovative "Biology of Mindfulness" event designed for pre-service educators in Duke's Master of Arts in Teaching program. Developed through collaboration with a community plant shop owner and botanist, this event combined the science of houseplants with the science of mindfulness to offer an immersive, interdisciplinary experience. Pre-service teachers explored the biological processes that keep plants thriving, such as photosynthesis, cellular respiration, and adaptive responses to stress, alongside the biological and psychological mechanisms behind human mindfulness practices. Framing mindfulness as both a scientific and pedagogical tool, the event created space for pre-service STEM teachers to engage in critical self-reflection and stress-reduction techniques grounded in biological knowledge.

This presentation draws on data from three years of a larger, five-year qualitative research study on mindfulness and teacher development. Data sources include post-seminar evaluation surveys, semi-structured interviews, and focus groups with participating MAT students. Findings suggest that this experiential learning model supported early-career STEM teachers in cultivating habits of presence, resilience, and reflective practice: key factors in teacher retention and effectiveness. By bridging scientific content with culturally responsive pedagogy, the "Biology of Mindfulness" seminar offers a replicable, high-impact model for embedding wellness, critical inquiry, and interdisciplinary learning into teacher preparation programs. Implications for program design, equity-centered pedagogy, and long-term teacher sustainability

Keywords: biology; mindfulness; pre-service teachers; program implementation; STEM teachers