

Becoming a STEMM Educator While Teaching About Germs in Kindergarten

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OVERVIEW: A kindergarten unit on germs shows how teachers become STEMM educators not individually, but through entanglements with students, materials, sociopolitical histories, and the lingering effects of the COVID-19 pandemic.

KEYWORDS: Equity/Social Justice, Science Teaching, STEM Education

AUDIENCE: Teacher educators; district leaders; science curriculum designers; researchers studying teacher identity and early childhood STEMM learning.

KEY POINTS

- Teacher STEMM identities emerge through relationships with students, materials, and contexts.
- A kindergarten germs unit supported inquiry and helped students process pandemic anxieties.
- Institutional conditions (e.g., mandates, staffing instability, accountability pressures) shaped what kinds of STEMM teaching were possible.
- Teachers are more likely to embrace STEMM when it connects to students' lives.

INTRODUCTION Recent STEMM education reforms have intensified attention to how teachers come to be recognized as STEMM educators. Much of this work frames identity as developing through reflection, professional learning, or changing beliefs. Other scholarship situates identity within sociopolitical conditions, foregrounding how race and place shape participation in STEMM education. Thinking with posthumanist scholarship, however, teacher identity does not originate with the individual. Instead, STEMM educator identities take shape through entanglements among teachers, students, curricular materials, institutional policies, and schooling histories. A kindergarten germs unit implemented after COVID-19 offers an empirical site through which these relations can be mapped as students, materials, institutional protocols, and pandemic experiences intra-act in the ongoing becoming of STEMM teaching.

FINDINGS Mapping Classroom encounters across the unit on Germs, Ms. West's becoming-STEMM educator did not unfold as an individual shift in beliefs or practice. Instead, her STEMM teaching materialized through intra-actions among the teacher, her students, curricular materials, and the institutional conditions of Vernon School. These relations continually reconfigured what STEMM education could become in the classroom. The germs unit entered a school environment already shaped by mandates, fidelity checks, and accountability pressures, where another curriculum risked becoming an added demand. As the unit unfolded, new relations took shape as students' curiosity intra-acted with classroom routines and

Materials. Germ investigations invited students to map how germs moved across classroom surfaces and consider ways to reduce illness in their community. STEMM learning emerged through entanglements of inquiry, pandemic-shaped concerns about illness, and collective efforts to care for one another. Ms. West's STEMM educator identity thus takes shape within these shifting material, affective, and institutional relations that animated classroom life.

TAKEAWAYS Following the classroom relations mapped in this study, it can be observed that teacher learning does not occur solely through professional development or changes in beliefs. Instead, STEMM educator identities materialize through ongoing relations among teachers, students, materials, institutional expectations, and the historical conditions of schooling. Attending to these relations highlights the importance of curriculum experiences that resonate with students' lived realities. In this kindergarten classroom, the investigation of germs intra-acted with students' pandemic experiences, creating space for scientific inquiry, collective care, and shared responsibility for classroom health. For teacher education and curriculum design, this work calls for professional learning environments that attend to the material, affective, and institutional conditions shaping classroom practice. Supporting STEMM teaching, therefore, involves more than providing teachers with new strategies or knowledge; it involves cultivating a pedagogy of care that attends to the broader relations through which STEMM education comes to matter in schools.

