

Teachers' Planned Use of Place-Based Stories Rooted in Students' Everyday Experiences of Natural Phenomenon

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Teacher Noticing of students' everyday ideas in science matters!

- Students gain deeper conceptual understanding in classrooms where teachers intentionally listen to, make sense of, and respond to students' ideas.
- When teachers notice students' everyday ideas they are doing a number of things: making thinking visible in the classroom, connecting students' ideas to the discipline, engaging students in sense-making around their thinking, etc..
- Hence students learn more deeply because their learning is grounded in their own ideas and reasoning.

Teacher Noticing happens across the work of teaching science—including during lesson planning! (And it matters in this context too!)

- When teachers notice students' everyday ideas about and experiences in the natural world WHILE PLANNING they are doing a number of things. They are designing science lessons that: make thinking visible in the classroom, connect students' ideas to the discipline, engage students in sense-making around their thinking, etc..
- Hence, science lessons are designed to center students' ideas and reasoning.

(Selected References: Atkin & Coffey, 2003; Atwood, et al., 2010; Ball, 1993; Coffey et al., 2011; Empson & Jacobs, 2008; Hammer, Goldberg, & Fargason, 2012; Hammer & vanZee, 2006; Kersting et al., 2010; Larkin, 2012; NRC, 2012; Piaget, 1985; Rosebery et al., 2010; Roth et al., 2010; Saxe, Gearhart, & Seltzer, 1999; Shavelson & Huang, 2003; Sherin, Jacobs, & Philipp, 2011; Thompson, Braaten, & Windschitl, 2009; Vygotsky, 1978; Windschitl et al., 2012)

RESEARCH OVERVIEW

LARGER GOAL: To investigate Teacher Noticing in the context of science lesson planning. This research seeks to understand whether and how teachers attend to, make sense of, and use children's everyday ideas and experiences as they plan science lessons.

SPECIFIC PURPOSE

- As part of the larger Teacher Noticing research project, we noticed teachers often used place-based stories when they were asked to consider their students everyday thinking while planning science lessons.
- We wanted to look at these moments more deeply in order to understand their role in Teacher Noticing. This research examines place-based stories taken up by 5th-grade teachers as they co-planned science lessons.

RESEARCH QUESTIONS

1. Why do teachers plan to use place-based stories in their science lessons?
2. What do these place-based stories contain?
3. What representations are in these place-based stories that students could use to reason about scientific phenomena?

RESEARCH DESIGN

CONTEXT: Two elementary schools serving primarily rural and low SES students located in the Appalachian region of the United States

- 9 teachers (all identified as native residents of the state where the study took place)
- All teachers reported having had similar lived experiences as their students growing up in rural and semi-rural Appalachian communities

Teachers were asked to actively notice their students' thinking while co-planning science lessons.



- Prior to the study, teachers participated in Teacher Noticing PD where they co-constructed an understanding of Teacher Noticing.
- Therefore, it was assumed teachers had a shared understanding of what was being asked of them when given the prompt to "actively notice your students' thinking while planning this science lesson".

DATA: Videos and transcripts of 12 collaborative lesson planning sessions (and artifacts generated during these sessions (e.g. notes made on lesson plans, curriculum resources used, etc.).

ANALYSIS: First identified instances across the 12 transcripts where teachers discussed a place-based story (8 instances were identified). Then coded excerpts across three dimensions: (1) teacher reasoning (e.g. why teachers planned to use place-based stories), (2) story context (e.g. natural phenomena, location, type of experience, etc.), and (3) representations present (e.g. photo, map, sound clip, etc.).

Why Teachers Planned to Use Place-Based Stories

Teachers' primary reason for using place-based stories was because they provided students a familiar context in which to access unfamiliar science content.

Yesterday, Abby described roadkill she saw on the way to school.



We could use this! What does she think happens to it over time? Do you think she sees it decomposing?

Teachers' reasons to use place-based stories were: (1) to provide students a familiar context in which to access unfamiliar science content; (2) to increase students' interest in the science content; and, (3) as teachers, to relate to students by connecting to their everyday lived experiences.

Place-Based Story Contexts

Place-based story contexts were specific to Appalachia and to experiences their students have had outside of school.

...the plants grow in their backyard, or in the forests where they go hunting...



...wild ramp, stinging nettle, thorny locust...

Across all eight instances where teachers discussed a place-based story, teachers drew on their students' own stories of hunting, fishing, growing gardens, gathering wild foods, and other activities that are common activities for families in rural and semi-rural Appalachia.

Representations in Place-Based Stories

Most place-based stories involved two different representations that students could use to reason about scientific phenomena.

Wouldn't it be cool if we had a video of one of our students on that roller coaster ride. I wonder if we could find one.



People are screaming their heads off on the roller coaster ride. We can use that...

Seven out of the eight place-based stories involved two different representations that students could use to reason about scientific phenomena—the story itself and a visual prop (e.g. photo/video, a plant, etc.).