

Developing Interpretive Power in Science Teaching

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Abstract

Early career teachers rarely receive sustained support for addressing issues of diversity and equity in their science teaching. This paper reports on design research to create a 30hour professional development seminar focused on cultivating the interpretive power of early career teachers who teach science to students from historically non-dominant communities. Interpretive power refers to teachers' attunement to (a) students' diverse sense-making repertoires as intellectually generative in science and (b) expansive pedagogical practices that encourage, make visible, and intentionally build on students' ideas, experiences, and perspectives on scientific phenomena.

The seminar sought to integrate student sense-making, scientific subject matter, teaching practice, and matters of equity and diversity on the same plane of professional inquiry by engaging participants in:

- (a) learning plant science;
- (b) analyzing classroom cases;
- (c) experimenting with expansive discourse practices in their classrooms; and
- (d) analyzing their classroom experiments in relation to student sense-making and expansive pedagogy.

Twenty-eight teachers participated in two cycles of design research. An interview-based transcript analysis task captured shifts in teachers' interpretive power through their participation in the seminar. Findings showed that the teachers developed greater attunement to: complexity in students' scientific ideas; the intellectual generativity of students' sense-making; student talk as evidence of in-process, emergent thinking; and co-construction of meaning in classroom discussions. Findings also showed that participants developed deeper understanding of the functions of expansive teaching practices in fostering student sense-making in science and greater commitment to engaging in expansive practices in their classroom science discussions.

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