

Vision in, of, and for Ambitious Science Teaching

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Purpose

Fundamental to the recent reform vision for science education (NRC, 2012) are ambitious forms of teaching, such as facilitating productive discussions, that capitalize on students' ideas and experiences to support students' sensemaking (Kloser, 2014; Windschitl & Calabrese- Barton, 2012). This type of teaching, however, is not a natural act for many teachers; they need support to appropriate a vision of such teaching. This study seeks to understand teachers' vision *in* practice (i.e., professional vision) and its relation to their vision *of* ambitious teaching after their involvement in a two-year professional learning program centered on facilitating productive science discussions aligned to reform vision.

Theoretical Framework

Teachers' vision *in* practice comprises their professional vision that enables them to see and understand classroom interactions in particular ways (Goodwin, 1994; Sherin, 2007). It is captured in what they notice in practice and how they interpret teaching episodes (e.g., Levin & Richards, 2011; Luna & Sherin, 2017; Sherin & van Es, 2005). Teachers' vision *of* practice is about teachers' images of ideal practice (Hammerness, 2001; Munter, 2014). We posit that teachers' vision *of* a certain practice, such as fostering productive talk, can inform their vision *in* practice, such as what they notice when interpreting teaching episodes that feature student talk.

Methods

Data sources include interviews with all four participants: one comprising teachers' analysis of a video-recorded teaching episode, and the second about their reflections on productive science talk. We analyzed the data for evidence of: 1) teachers' noticings by drawing on existing schemes in the literature for characterizing teachers' vision *in* practice (e.g., Author, 2015; van Es & Sherin, 2008), and 2) teachers' explicit statements regarding what instruction should look like during the facilitation of productive discussion (e.g., Munter, 2014).

Findings

The analysis revealed a relationship between teachers' vision *of* productive talk and their vision *in* practice, as reflected in what they noticed in the episode and how they wanted to act on what they noticed. Our findings showed that when teachers' vision *of* productive talk was reduced to specific elements of teaching in isolation of a larger goal, their vision *in* practice was limited to identifying the presence or absence of these elements. For example, Jerry's focus on productive talk as incorporating more than one viewpoint was related to his noticing of a single student idea as dominating, and his desire to incorporate more voices to the discussion. Teachers who had a vision of productive talk as promoting students' intellectual agency and ownership of their learning, identified nuanced aspects of the episode in relation to that goal. For instance, Daniel noticed how

various teacher moves served the epistemic work of students' collectively generating explanations of the phenomenon.

Significance

As the field moves towards exploring the role of teachers' vision for improving their instructional practices (Fullan, 1993, Munter & Correnti, 2017), our study contributes novel insights regarding the interplay of teachers' vision *in* practice and vision *of* practice as they learn to develop and enact ambitious forms of science teaching to promote reform vision.

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