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Title of your paper:

Measuring teacher quality: Surveys versus Video-Based Think Aloud Protocols

Abstract

Taking a Deep Dive: Investigating the impact of what teachers take up and use after participating in a professional development, aims to understand teacher learning by studying teachers that participated in three different professional development (PD) programs. We describe a survey instrument that asked participants to reflect on their PD experience and characterize their past and/or current use of the PD content, pedagogy and materials as well as the support they received to implement new content and particular instructional practices. Second, we describe an abbreviated video-based *think aloud protocol* that we used to measure teacher quality. Seventeen participants were asked to videotape a classroom lesson once a month for 10 months and identify clips in which they were using content, pedagogy and/or resources from the PD they participated in. During one-hour zoom interviews, each participant reviewed selected clips from their classroom videos with the research team as a part of the Think Aloud Protocol. We document and discuss the differences identified in the results from the separate analyses of each teacher quality measure. This paper illustrates the affordances and constraints of using the two instruments (survey and Think Aloud Protocol) to capture teacher's perceptions and implementation of learning from the three PD programs related to content, pedagogy, and resources four to five years after participation.

Extended summary

Taking a Deep Dive (TaDD): Investigating the impact of what teachers take up and use four to five years after participating in a professional development (PD), aims to understand teacher learning by studying teachers that participated in three different PDs. We illustrate the affordances and constraints of using two instruments, a survey and a think aloud protocol, to capture teacher's perceptions and implementation of learning related to content, pedagogy, and resources four to five years after they participated.

Situative theorists define learning as changes in participation in socially organized activity (Greeno et al., 1996). A situative perspective suggests that groups of teachers who take part in different PD workshops using different materials, with different facilitators, and are situated within different educational contexts might have very different learning opportunities and experiences impacted by the role of context.

TaDD collected data from three large PD projects in order to use case studies and cross-case analysis to further inform what teachers take up and use in different PDs in different contexts. The three PD projects are:

1. *Learning and Teaching Geometry* (LTG), explored the learning and teaching of transformations-based geometry.
2. *Collaborate Research: TRUMath and Lesson Study* (LS), engaged teams of teachers in lesson study to work on specific shifts in teaching practice aligned with the TRU Framework.
3. *Visual Access to Mathematics* (VAM), aimed to build skills in linguistically responsive mathematics teaching to improve students' problem solving and communication skills through the use of visual representations.

Sixty-six participants from the projects took a 32-question **survey** (LTG had 28 participants, VAM had 25 and Lesson Study had 13). This survey asked participants to reflect on their PD experience and characterize their past and/or current use of the PD content, pedagogy and materials as well as the support they received to implement new content and particular instructional practices. The survey included seven Likert scale questions, where participants responded to statements on a scale of 1-10, as well as eighteen follow up questions that allowed the participants to explain their numeric response.

Seventeen participants **videotaped a classroom lesson** once a month for 10 months and identified clips that demonstrated use of content, pedagogy and/or resources from the PD they participated in. The 17 participants represented different teaching contexts with regard to school make-up and resources as well as grade levels taught. Two one-hour Zoom interviews were conducted with each participant. The first part of these interviews aimed to understand the teachers' experiences with the PD, what they remembered related to the goals of the PD and what strategies, content and resources they used from the PD and continue to use currently in their classrooms. The second part of these interviews followed **a think aloud protocol**, where teachers watched video clips they selected and described their perceived uptake and implementation of content, pedagogy, and resources from the PD.

Survey results. Seven Likert scale questions were analyzed and we found that geographical context and individual PD projects highly impacted the ways participants perceived their PD experiences (see Koellner, Placa, Seago, and Yormak, 2021). These analyses provided the impetus for the deeper analyses where we coded qualitative questions using apriori and emergent codes to understand teacher learning in more nuanced ways. In LS, teachers commented on content only 8% of the time. When participants discussed pedagogy, most comments were related to working with diverse learners, and if they discussed a resource, they referenced a specific resource, usually the TRU framework which was the centerpiece of their project. The LTG project codes highlight content codes that focus on very specific content topics. In terms of pedagogy, the LTG teachers most frequently commented on student thinking. In terms of resources, LTG teachers most often talked both about specific and general resources and when referring to support they discussed support from colleagues and the facilitator. The VAM teachers talked very specifically about the content for teacher learning and in terms of pedagogy, they discussed the strategies they learned to work with diverse learners most often. In terms of resources, the VAM teachers discussed specific resources and representations the most often. Similar to LTG, VAM teachers discussed support from colleagues and the facilitator most often.

Video-based think aloud protocol. The survey data was fairly consistent with the interview data but there appeared to be more variation between participants in the survey than the teachers from our smaller sample. From the interviews, we learned that teachers in the LTG program implemented pedagogical strategies highly related to the professional development across mathematics content domains not only in geometry. LTG teachers used representations and technological tools to enhance instruction on a regular basis that engaged students in conceptual learning. The VAM project teachers survey was more consistent with the survey and video-based think aloud protocol in the

ways in which they shared aspects of using representations. Yet, the think aloud protocol and videos highlighted more detail related to their uptake. Teachers were able to explain how they selected and used specific mathematical representations and illustrate how they used them to foster conceptual understanding of mathematical ideas related to ratio and proportional reasoning. The LS project teachers' interviews provided insight into the challenges teachers had implementing learnings from the PD which was not as apparent in the survey data. In the interviews, they described the difficulties that arose in using the TRU framework in a large urban district that experienced a lot of transition. However, participants shared how the LS PD project impacted their lesson planning and in particular how they were more likely to anticipate student misconceptions and plan for them. Although the survey instrument focused on content, pedagogy and resources, it did not specifically address lesson planning.

While survey data provided information about perceptions of uptake years after participation in PD, the think aloud protocols allowed for an in-depth examination of how these perceptions translated to classroom practice across different contexts. Unlike prior research findings of self report survey data, teachers' self perceived uptake matched their implementation evidenced by submission of monthly videos shared with researchers. The interviews also allowed us to probe deeper about the challenges teachers faced in uptake and the quality of uptake. These different measures provided complimentary insight into the complexity of teacher uptake.

References

- Greeno, J. G., Collins, A., & Resnick, L. B. (1996). Cognition and Learning. In DC Berliner & RC Calfee (Eds.), *Handbook of educational psychology*.
- Koellner, K., Placa, N., Seago, N., Yormak, G. (2021). Disentangling the role of context and community in teacher professional development uptake. In A. I. Scistan, J. C. Cortes-Zavala & P. M. Ruiz-Arias *Proceedings of the 42nd Meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education, Mexico* (pp. 2001-2008). Cinvestav / AMIUTEM / PME-NA. <https://doi.org/10.51272/pmena.42.2020>

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