

Background of Study

As teachers are asked to implement new reforms in mathematics education, professional development (PD) leaders are tasked with helping teachers learn mathematics content deeply and reorganize how they teach mathematics in order to align with content and practice standards. Providing opportunities for teachers to participate in collaborative professional learning where they examine and reflect on instructional practices and student thinking in relation to mathematics content is critical for supporting teacher change (Koellner, Jacobs, & Borko, 2011). Thus, there is a strong need for high quality professional development that supports mathematical discourse and the use of rich mathematical tasks (Marrongelle, Sztajn, & Smith, 2013). Further, professional development must build local capacity within schools to provide teachers with sustained support as they shift their pedagogical approach to teaching mathematics.

To support mathematics teachers and to move towards sustainable and scalable PD in local contexts, many in the mathematics education field suggest that we turn our attention toward the development of PD leaders within the school setting with the knowledge and skills to facilitate school-based PD (e.g., Lesseig, et al., 2016). Based on a review of the literature and their experience working with PD leaders, Borko, Koellner, and Jacobs (2011) outlined three practices central to effective PD facilitation: engaging teachers in productive mathematical work, leading discussions about student reasoning and instructional practices, and building a professional community. More specifically, van Es and colleagues (2014) identified four categories of moves that PD leaders use for engaging teachers in video-based discussions (VBDs), including orienting teachers to the video analysis task, sustaining an inquiry stance, maintaining a focus on the classroom video and the mathematics, and supporting group collaboration. However, more research is needed on the moves PD leaders make, how their moves impact the conversations, and the different approaches PD leaders take to support teacher learning. Further, the PD literature is limited in discussing how PD leaders facilitate generative discussions as they support teacher learning about student thinking and instructional practices.

Objectives

I have been working with colleagues from Stanford University, Dr. Hilda Borko and Dr. Edit Khachatryan, to better understand facilitation practices that teacher leaders (TLs) use in leading Problem Solving Cycle (PSC) professional development workshops. We have been interested in how TLs bring the quality of conversations within video-based teacher PD – both the conceptual depth of the conversations and the cognitive levels of facilitation moves – to high levels. Our analyses using StudioCode® has included videos of PSC workshops in which the TLs used video clips from their own and other teachers' Fuel Gauge Problem lessons to facilitate discussion around mathematics teaching and learning. We are finishing up our analyses and are in the process of outlining our manuscript, *The Arc of Facilitating Productive Discussions in Mathematics Professional Development*, that examines how teacher leaders engage teachers in learning about teaching about video-based discussions. Our goal is to submit the manuscript to Mathematics Teacher Educator (MTE) journal by the end of Summer 2018.

Significance

This study will contribute to the field's understanding about how teacher leader facilitation practices impact discussions about mathematics, student thinking, and pedagogy in

a professional development setting. Further it will highlight the importance of skilled facilitation in leading productive video-based discussions that reach high levels of conceptual depth. This work may provide PD leaders with further understanding of how their facilitation moves impact conversations, and the different approaches PD leaders take to support teacher learning. This work aims to support PD leaders as they hone their skills and gain confidence in facilitating in leading discussions focused on videos from other teachers' classrooms.

This manuscript is central to my work as a teacher educator and researcher as my research has focused on supporting both preservice and inservice teachers to lead productive discussions and attend to student thinking. By receiving fellowship funds, I will be able to devote time to writing and collaborating with colleagues to submit the manuscript to MTE journal. MTE is a peer-reviewed journal that reaches a broad audience of teacher educators, coaches, and practicing teachers. Its aim is to build a professional knowledge base for mathematics teacher educators while supporting practitioners in the field.

In the coming years, I hope to offer professional development similar to PSC that focuses on implementing rich mathematical tasks, increasing teacher knowledge of teaching mathematics, and improving instructional practices. As a faculty researcher, my goal is to continue to conduct meaningful, community-based research that will contribute to the field of mathematics education and help inform practitioners to teach mathematics effectively.

Plan of Work

Date	Task
February 2018-April 2018	Finish data analyses process. Develop outline for manuscript
May-July 2018	Write
July 2018	Ask colleagues to review work
August/September 2018	Revisions
September 2018	Submit article to MTE

References

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