Investigating a Professional Development Facilitator’s Moves to Enhance Teacher Knowledge and Practices

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Introduction

There is a lack of empirical studies in the field that address PD for in-service teachers of Latino/a students, and in particular, effective intervention strategies to foster teachers’ knowledge and instructional practices (Flores, Clark, Claeys, & Villarreal, 2007). Usually, the design of the PD interventions in previous research follows the widespread model of short-term workshops wherein the PD facilitator delivers pre-conceived content. In addition, these studies often leave under-theorized the different strategies used to encourage teacher learning and change. Although the lack of knowledge of the effects of PD interventions in teacher change and student learning is a widespread issue in the field of mathematics education (Kazemi & Hubbard, 2008), the increasing number of Latino students in the U.S. educational system demands supporting teachers in order to effectively respond to the specific needs of this student population (Planas & Civil, 2009).

Theoretical Perspectives

The work presented here draws on a three-year long study aimed to foster in-service teachers’ knowledge of language, mathematics, curriculum, and instruction in order to support their Latino/a students’ learning of mathematics. The PD intervention was designed taking into account research-based strategies that have been found to be effective in enhancing teacher learning, such as (a) reflective and collective participation in “critical activities of teaching” (Darling-Hammond, 2008, p. 95), which include planning lessons, modifying and creating curriculum materials, analyzing student mathematical thinking and learning, and enhancing student participation and discussion in class; and (b) greater contextualized experiences linked to teachers’ own concerns and questions (Bednarz, 1998).

Regarding these aspects, the interactions between the PD facilitator and the participating teachers were modeled using a cycle of learning comprised of planning, implementing, and coevaluating. The planning stage targeted four components useful to support Latino/a students’ learning of mathematics (Authors, 2011) such as fostering the development of teachers’ mathematics knowledge; enhancing mathematics tasks; establishing, facilitating, and maintaining productive classroom interactions; and supporting the development of language. The second stage, implementing, consisted of carrying out the instructional activities and strategies as
planned in the first stage. Finally, the third stage, *coevaluating*, allowed the PD facilitator and teachers to discuss problems, doubts, and difficulties during the implementation stage. In this sense, the PD intervention was initiated by participating teachers’ own preoccupations and questions about their practice. As some researchers have pointed out (e.g., Whitcomb, Borko, & Liston, 2009), greater contextualized experiences linked to familiar and daily situations provide teachers with more significant and robust professional knowledge needed to develop effective teaching practices.

![Figure 1. The Cycle of Teacher Learning](image)

Detailed observation of the four participating teachers’ instruction and data from the planning and debrief sessions led the research team to identify changes in beliefs and teaching practices as well as the enhancement of their knowledge of mathematics and students’ thinking. Thus, the research team became interested in understanding the nature of the PD that influenced this change. More specifically, we aimed to answer the following research questions: *What are the characteristics of professional development moves that led to improvement in mathematics teaching practices? How does the facilitator enact these moves?*

Given the importance of supporting teacher learning through PD, there is a need to know more about what PD facilitators do to promote change in teacher knowledge and practices. Although there exists abundant literature on critical components of effective PD design (Bell, Wilson, Higgins, & McCoach, 2010; Borko, 2004; Garet, Porter, Desimone, Birman, & Yoon, 2001; Heck, Banilower, Weiss, & Rosenberg, 2008), only few studies have focused on the strategies, knowledge, and role of PD facilitators that could spotlight meaningful and successful ways of supporting teacher learning and change (Elliot et. al., 2009).

**Methods**

Four third grade teachers in two schools with different years of teaching experience and credentials participated in the study. The PD facilitator is a researcher with significant experience in designing and implementing PD. She met the participating teachers every week to plan lessons, analyze students’ work and interactions through a discussion of videotaped lessons, and
so forth. For the purposes of this study, audio records of the planning meetings constituted the main data source. Twenty-six planning meeting of the first year were transcribed. Adopting a grounded theory approach (Bernard, 2006; Creswell, 2007), three members of the research team first read a randomly selected subset of eight of the planning meetings from the first year looking for salient impressions. They sought regularities and patterns throughout the transcriptions and elaborated an initial list of strategies used by the PD facilitator to enhance teacher learning. The notion of moves (van Dijk, 1987) from the field of semiotics proved as a useful theoretical construct in understanding goal-oriented discursive actions of the PD facilitator. Drawing on the notion of moves, the research team coded and analyzed each transcription paying particular attention to the facilitator’s actions, the objects of her actions and specific strategies she employed. The planning meetings were coded individually and compared among the research team. Disagreements in coding led to several modifications and negotiated codes were used in subsequent analyses. The researchers also checked for inter-rater reliability by contrasting the findings with the PD facilitator’s goals. The theoretical model developed by the research team to characterize the PD facilitator intervention is presented in the findings.

Findings

As mentioned above, the notion of move was introduced to describe, analyze, and systematize the strategies used by the PD facilitator aimed to promote teacher change. Based on the developments of semiotic and discourse analysis, a move is defined as “a functional unit in a strategy interaction sequence” (van Dijk, 1987, p. 88) that is part of a broader discursive interchange among people. As any communicative act, a move is intentional and intended to help participants reach a goal previously established by them, although such goals can remain implicit. van Dijk notes that even though the overall intent of a communicative act is to help interlocutors reach such a predetermined goal, “a move is each component act that is intended (consciously or not) to contribute to the realization of that goal” (p. 88). Therefore, in any communicative act, different moves can be introduced to achieve a unique, general goal.

Our characterization of move is comprised of four elements: (a) an action; (b) an object; (c) a strategy; and finally, (d) a goal. We define action as the facts and processes introduced by the PD facilitator to achieve the goal. In general terms, these actions affect and modify an object, which in our study, correspond to the main categories of teacher knowledge to be improved: language, mathematics, curriculum, instruction, and student thinking. A strategy is a “persistent way of ordering action” (Swidler, 1986, p. 274), or, in order words, the way in which the action is carried out. It is important to note that according to Swidler (1986), goals and “interests are the engine of action, pushing it along,” and therefore, they serve as clues in understanding what and how the move was implemented in the context of PD facilitator-teacher interactions. While the PD facilitator had the goal of improving teachers’ knowledge and practices through various activities during the intervention, she also set sub-goals based on what she observed in teachers’ practices and what they needed.

Figure 2 summarizes the constituting elements of a move.
Figure 2. The Constitutive Elements of a Move

The majority of the interactions held between the group of participating teachers and the PD facilitator were mainly discursive interchanges revolving around improving and adapting curriculum materials and instructional activities to foster Latino/a students’ language and participation while learning mathematics. We consider these interchanges as communicative acts which—in a first level of analysis—mainly consist of providing justifications, constructing shared meaning, challenging beliefs and assumptions, and exemplifying general propositions. In a second level of analysis, such communicative acts are goal-oriented towards supporting and bringing about teacher change, or, in other words, they are persuasive and intended to convince the others—the participating teachers—that some actions are possible to transform teaching practices to foster Latino/a students’ learning of mathematics.

The following example illustrates one such PD move.

**Example.** In one of the planning meetings, the teachers conveyed doubts about introducing a specific mathematical model in their instruction. The PD facilitator uses an example of an elementary teacher who had the same concerns:

F: …So one teacher that’s been using…started using this a couple weeks ago, the kids had used the hundred chart in second grade. And so she said, do you think it will be confusing to switch them to this? And I said, I don’t think so, I said, how much have you emphasized the hundred chart this year? She goes, oh, not very much. So she decided to call this a number wrap to distinguish it. So that’s worked pretty well… (Planning meeting, December 2009).

Clearly, this move was intended to convince the participating teachers to introduce the new mathematical model by using an example of a real teacher, like them, who successfully implemented it. The move conveys a message of possibility and plausibility by communicating the success of another teacher. The PD facilitator neither imposes her academic authority nor forces the teachers to carry out an activity about which they feel insecure. The strength of her argument lies in using an example of a real teacher like the participants to challenge the teachers’ concerns. The move described as Depict teachers’ potential instructional practices by using particular and real classroom situations has the following structure:

**a. Action (verb):** Depict
b. **Object:** teachers’ potential instructional practices

c. **Strategy:** Using particular and real classroom situations.

d. **Goal:** To provide teachers with knowledge that facilitates mathematics instruction and decision-making.

Figure 3. Structure of the Move

As a result of the coding process, we identified five categories of PD facilitator moves: curriculum materials, instruction, language, mathematics content, and student thinking. These categories represent the focus of the PD intervention in order to promote teacher change. Table 1 summarizes the categories and the corresponding PD facilitators’ moves identified by the research team.
Table 1. Characterization of the PD Facilitator’s Moves

<table>
<thead>
<tr>
<th>Categories</th>
<th>PD Facilitator’s Moves</th>
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<tbody>
<tr>
<td><strong>Curriculum Materials</strong></td>
<td>Introduce changes in instructional tasks and curriculum materials by making the context relevant to children’s lives.</td>
</tr>
<tr>
<td></td>
<td>Introduce changes in curriculum materials by suggesting omissions and modifications.</td>
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<tr>
<td></td>
<td>Interpret curriculum materials by unpacking content, facts, and elements related to mathematics and language.</td>
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<tr>
<td><strong>Mathematics Instruction</strong></td>
<td>Depict teachers’ potential instructional practices by using particular and real classroom situations.</td>
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<td></td>
<td>Emphasize where to focus during instruction by revealing mathematics concepts addressed in instructional activities.</td>
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<td></td>
<td>Enhance an instructional move by modeling possible teacher’s actions.</td>
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<td></td>
<td>Facilitate teacher decision-making by posing questions and introducing hypothetical classroom situations.</td>
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<td></td>
<td>Model an instructional strategy by using role-playing with the teachers.</td>
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<tr>
<td><strong>Language</strong></td>
<td>Call teachers’ attention to precision of mathematics language by asking them to notice.</td>
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<tr>
<td></td>
<td>Call teachers’ attention to precision of mathematics language by posing questions.</td>
</tr>
<tr>
<td></td>
<td>Call teachers’ attention to precision of mathematics language by providing other teachers’ experiences/teachers’ real experiences.</td>
</tr>
<tr>
<td></td>
<td>Unpack language in curriculum materials by asking the teachers to notice.</td>
</tr>
<tr>
<td></td>
<td>Unpack language in instructional activities/strategies by posing questions.</td>
</tr>
<tr>
<td><strong>Mathematics Content</strong></td>
<td>Unpack mathematical content and ideas addressed in curriculum materials by posing questions.</td>
</tr>
<tr>
<td></td>
<td>Unpack mathematical content and ideas addressed in curriculum materials by asking the teachers to notice.</td>
</tr>
<tr>
<td></td>
<td>Unpack mathematical content and ideas addressed in instructional strategies/activity by asking the teachers to notice.</td>
</tr>
<tr>
<td><strong>Student Thinking</strong></td>
<td>Anticipate students’ mathematics actions, behaviors, and thinking by providing potential instructional activities and strategies.</td>
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<td></td>
<td>Depict general students’ mathematical mistakes and behaviors by using research findings and real students’ mathematical mistakes and behaviors.</td>
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<tr>
<td></td>
<td>Call teachers’ attention to student mathematics thinking by posing questions about students’ difficulties.</td>
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</table>
Significance of the Study

The notion of move as proposed in this study is a promising conceptual tool to move the field forward in conceptualizing PD facilitators’ work. As we examine the practices of PD facilitators, we need to consider their actions, strategies, and goals as well as the objects on which they focus. Although the PD intervention in our study focused on elementary teachers of Latino/a students with a significant component on issues of equity and diversity, it does shed light on successful strategies to enhance teacher learning, specifically related to the areas of instruction, curriculum materials, language, subject matter knowledge, and student thinking. Knowing more about specific actions, strategies, and goals of a facilitator together with the focus of her moves may afford opportunities to contribute to the improvement of other teacher educators’ practices and support their learning. Additional studies in different PD contexts for teachers at different grade bands could identify additional moves that will inform PD facilitators and practitioners about successful formative strategies to be used with teachers in order to improve not only Latino/a students’ learning of mathematics but also the mathematics learning of other student populations. Our work in conceptualizing a PD facilitator’s work in this paper has the potential to inform both preparing PD facilitators towards the complex demands of their work, and future research on PD facilitators’ practices.

Even though the implementation and enactment of the PD facilitator’s moves by the participating teachers are not discussed in this paper, our analyses evidence the different learning paths followed by them, their challenges, and transformation in beliefs and practices. How PD facilitators’ moves influence teachers’ practices is an additional area of interest to be explored in future studies.

References


