MAKING TEACHER PD EFFECTIVE USING THE PRIMED FRAMEWORK

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This article presents strategies for coaches, specialists, and teacher leaders for applying a framework—*Professional Development: Research, Implementation, and Evaluation* (*PrimeD;* Saderholm et al., 2016)—to guide the effective implementation of teacher professional development (PD). This work is based on multiple research investigations of effective PD and the practical application of these ideas within actual PD settings with teachers in grades 3-5 and secondary mathematics and science.

The PrimeD framework scaffolds PD into four phases and illustrates how the phases interact and inform one another (Figure 1). PrimeD applies principles of improvement science (e.g., Bryk, Gomez, & Grunow, 2011; Bryk, Gomez, Grunow, & LeMahieu, 2015; Langley et al., 2009) and characteristics of effective PD (e.g., Desimone, 2009; Garet et al., 2001; Guskey, 2003; Loucks-Horsley et al., 2010; Sztajn, 2011) to provide a robust structure for achieving particular PD goals in K-12 settings. PrimeD calls for a formal, explicit, cyclic connection between formal PD activities and classroom implementation in ways that drive innovation in the classroom while also calling for a connection in which classroom experiences also come back to the whole group PD to drive their subsequent activities and inspire future directions. PrimeD supports PD in which teachers participate as partners rather than mere recipients of knowledge, following the overwhelming consensus of PD experts (e.g., Jones & O'Brien, 2014; Loucks-Horsley et al., 2010; Philippou et al., 2015). PrimeD incorporates networked improvement communities (NICs) to engage teachers in PD activities as partners and leaders in ways that drive

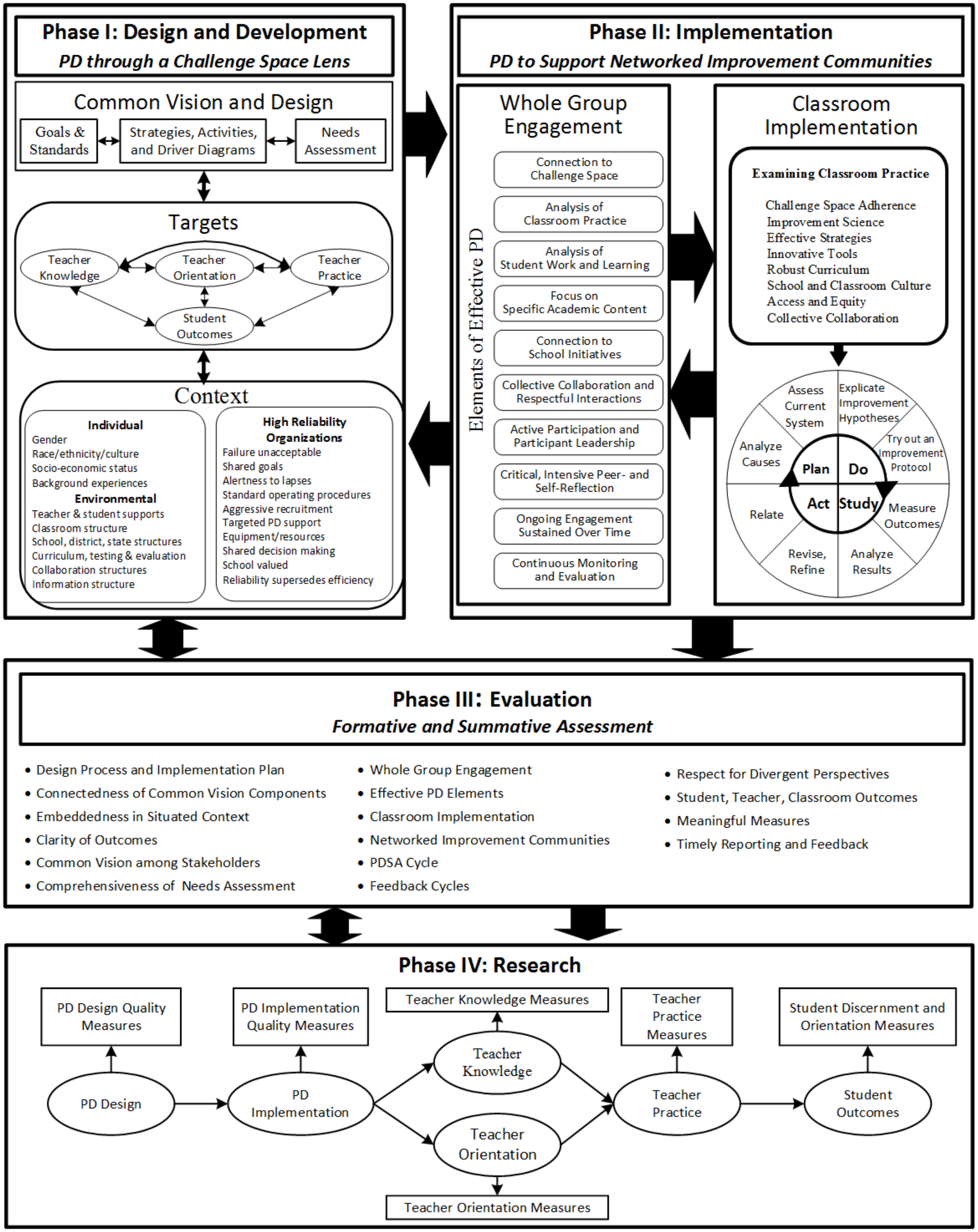

Figure 1. Professional Development: Research, IMplementation, and Evaluation framework (PrimeD; Saderholm et al., 2016)

meaningful and directed collaborative endeavors that not only become an important component of the PD, but also contribute to the evolution of the learning experience. The PrimeD framework explicitly pre-defines essential interactions and relationships among the facilitators, teams, and participants. The development of learning communities at the school and district levels is the crux of these interactions and relationships.

PD organized from the top down can easily create tension between the policy decision makers and the teachers who wish to have a voice in identifying their own PD needs (Jones & O'Brien, 2014). Teachers should be involved in the initial design so the PD program is best aligned with their individual schools and classrooms (Philippou, Papademetri-Kachrimani, and Louca, 2015). Even if actual participants have not yet been identified, having representative teachers from participating districts offers the possibility for input in initial planning meetings.

PrimeD frames PD as the systematic forming of partnerships. In Phase I, stakeholders (e.g., teachers, principals, coaches) identify challenges they deem important (e.g., instruction, teacher learning) with the PD planners, agree upon how they want to go about solving those challenges, and help design the PD process. In Phase II, the PD process is implemented in a way that situates teachers as partners and leaders. Feedback from teachers and other stakeholders initiates a review of the challenge space (i.e., bi-directional relationship between Phases I and II), which then informs future PD activities.

PrimeD separates the functions of evaluation and research while recognizing overlap (e.g., data sources) between them. Phase III calls for a strong formative component in the evaluation (e.g., regular, systematic observations of both PD and classrooms and interviews with stakeholders). The evaluation is considered a tool to foster open, objective communication that ensures all stakeholder viewpoints are heard. PrimeD is adaptable—not everything within the framework must be implemented all the time. Components within PrimeD can be chosen purposefully, allowing the framework to be adapted strategically and explicitly to contexts and situations through multiple feedback loops. In short, rather than offering a rigid agenda, PrimeD encourages questioning. For example: What needs to be done? Why is it not currently being done? How can it be done? How will we know if we accomplish it? How will we know if it is an improvement?

Phase I – Explicit Design to Structure the PD

Phase I provides a structure to purposefully guide the PD activities, evaluation, and research. The lack of Phase I can limit the potential effectiveness of the PD. For example, a robust, traditional PD offered through a state grant actively engaged teachers and coaches in meaningful mathematics and science activities; the evaluation, however, identified a lack of explicit design structures in the PD (Saderholm et al., 2016). Although the PD designers identified "change theory" as the overarching theory guiding the development of the institutes, the evaluators found no evidence of a coherent theory guiding the individual PD sections (e.g., no change theory research cited or aligned with such as Lewin, 1997; no common language across sections). Additionally, some PD facilitators stated that they were focused on inquiry and/or collaborative learning while other facilitators said they were focused on developing content knowledge. While the activities in individual sections might affect change according to their respective foci, the likelihood of coherent improvement toward particular goals was limited. This finding led to the incorporation of the first tenet of improvement science (Bryk et al., 2015) into PrimeD, that strong PD will be focused on a specific common aim. The first step therefore in the application of the PrimeD to teacher PD is the development of an overall plan (*program map* in Bryk et al., 2011) describing the program's target goals, challenges, strategies, and outcomes (*challenge space*).

Bush and Cook (2015) found that the explicit focus on building a strong program map and challenge space was critical for coherence and focus in PD programs they facilitated. The PrimeD framework served as a springboard to launch difficult conversations about areas of concern. For example, they found that they needed stronger communication with building principals. Explicitly holding themselves accountable for Phase I led them to brainstorm with their evaluator. Those conversations resulted in the addition of a periodic newsletter they began sending to building and district leadership to keep them abreast of the innovative work of their teachers, coaches, and students. This newsletter proved to be an extremely helpful tool for communication, and they received immediate positive responses from several building administrators. Phase I also helped them think critically about the constructs they planned to measure (e.g., teacher knowledge, teacher orientation, teacher practices, and student outcomes). Although they had an agreement with the district regarding which student achievement measures would be collected, a misunderstanding at some schools put them at risk of missing student data. Structuring the conversation around agreements already made in the challenge space helped them facilitate a difficult conversation regarding the need for the student measures in order to assess PD quality. As a result of this structured conversation that addressed the validity of the challenge space, they were able to overcome the obstacles to obtaining data.

Phase II – Cycles of PD Sessions and Classroom Implementation

The PrimeD framework organizes the execution of PD into cycles of a PD session ("whole-group engagement") followed by classroom implementation. Whole-group engagement explicitly targets the incorporation of effective PD elements (see Figure 1 for full list). In PrimeD, whole-group engagement concludes with a strategy for improving some aspect of teaching ("change idea" focused on a specific problem) related to the challenge space for teachers to individually test in their contexts (Bryk et al., 2011). Then participants implement and examine what they have learned through classroom implementation cycles. They share their results and understandings back to the group, which feeds back into further development of the subsequent PD activities.

For example, in Ross, Singer, and Rakes (2014), the classroom implementation cycle drove the substance of the whole-group engagement activities. The planning of each whole-group session began by reviewing the latest round of data collection and reflecting on teachers' progress toward the program goals. One particular session focused on clarifying the meaning of engineering design as it applies to biology (focus on specific academic content). The facilitators had prepared questions ahead of time to help foster participants' reflection throughout the session. The session began with a discussion to review the challenge space explicitly. The teacher participants brought in artifacts (e.g., student work, lesson plans) to analyze their own classroom practice. Teachers critically examined strengths and weaknesses of the artifacts and brainstormed how to improve instruction in relation to the challenge space.

Throughout Phase II there is a focus on the use of networked improvement communities (NICs) to accelerate, focus, and deepen learning and development. NICs are organized, systematic, problem-solving groups that focus on a specific common aim and embrace how strategies for change vary across differing conditions (Martin & Gobstein, 2015). NICs provide opportunities for the intentional collaboration needed to maintain excitement about teaching (Anderson, 2016) and leverage the expertise of participants to solve complex problems that do not have straightforward solutions (Gomez et al., 2017; Martin & Gobstein, 2015).

PrimeD incorporates the Plan-Do-Study-Act (PDSA) cycles (Langley et al., 2009), a broadly used tool in improvement science across fields, to structure the classroom implementation trials (Exhibit 3). Between PD sessions, teachers might progress through the entire PDSA cycle multiple times. Bryk et al. (2011) described PDSA as a means of moving teachers rapidly from vague or general ideas to effective teaching practices rooted in deeper understandings.

For example, in Rakes et al. (2017) teachers chose a particular challenge for the PDSA cycles and brainstormed what they might change in their teaching to meet that challenge (their "change idea"). Some of the key questions for the Plan stage were: (a) What is your change idea? (b) What is the goal of the test? What do you hope to accomplish by testing your change idea? (c) Describe your plan for implementing your change idea. The teachers then went back to their classrooms and tried out their change idea at least once. They then completed the prompt for the Do stage: Briefly describe what happened during the trial, surprises, difficulty getting data, obstacles, successes, etc. For the Study stage, the key prompts were (a) What were the results? and (b) What did you learn about your goals, change idea, and/or strategies? And for the Act stage, the key prompts were (a) Describe modifications and/or decisions for the next cycle; and (b) What will you do next? Participants found the integration of PDSA with whole-group engagement to be a transformative aspect of the PD. "I hadn't really thought about lessons in different units as being connected, but focusing on something to improve about my teaching made that happen. Now I think about each lesson as a chance to improve my teaching." They showed recognizable growth in their pedagogical content knowledge and use of effective teaching strategies.

The cycles of whole-group engagement and classroom implementation offer strong potential for fostering effective teaching practice. Iterative formative assessment via PDSA cycles plays a critical role in recognizing and addressing emergent issues not originally anticipated.

Phase III Evaluation

Evaluation in the PrimeD framework begins during Phase I and continues throughout Phase II, fulfilling a formative role that is integral to the PD process. Evaluators are a distinct part of the PD team, providing objective, formative feedback throughout the design phase and offering ideas about how the program can achieve the agreed-upon goals. During Phase II, evaluators observe PD sessions and examine evidence related to the quality of the PD (e.g., presentations, levels of engagement, activities). Issues that arise during implementation often signal the need to cycle back to Phase I. Evaluation results are carefully considered in light of the challenge space and the originally-agreed-upon strategies, moderating impulsive adjustments. Any changes to the design based on evaluation results should be a collective endeavor that can then adjust implementation activities as needed.

This iterative, formative evaluation cycle often plays a critical role in adjusting the PD designs to address unforeseen emergent issues. For example, Ross, Singer, and Rakes (2014) explicitly targeted the notion of phenomena-first teaching, allowing teachers to reflect on the positive impact on learning over a traditional lecture followed by a cookie-cutter lab (e.g., rote activity, step-by-step directions with no opportunities for students to weigh in on steps in the investigation, more hands-on than minds-on). The teachers found the whole notion un-compelling—they felt strongly that they need to teach the material <u>before</u> the students can investigate a phenomenon. The team re-assembled that evening to evaluate what "went wrong." They quickly realized that viewing the day as a failure was short-sighted: Getting to phenomena-first teaching was one of the major challenges of this multi-year PD program. Thus, if teachers were to accept and understand it in a day, the PD would not have been needed. Instead of scrambling to change activities haphazardly, the implementation and development team went back into Phase I and adjusted their understanding of the obstacles teachers were facing (e.g., pressures of standardized testing, time for deep instruction in a packed curriculum). With a clearer understanding of the challenge space, they developed activities to model phenomena-first teaching that explicitly addressed the obstacles. The next morning was a turning point in the PD: teachers had visible aha moments and the foundation was laid for them to begin trying to teach differently the next year.

Phase IV Research

PD research may focus on a number of constructs (e.g., teacher knowledge, student outcomes; see Figure 1). PrimeD also recognizes that teachers conduct research as a normal function of their practice; that is, they test and evaluate their approach to teaching every day. Some of that effort is contextually limited. PrimeD offers a structure that can make these normal research activities robust and meaningful for a larger audience by connecting Phase II and Phase IV activities. In Phase II, teachers create research from their classrooms and provide critical insight into questions about the PD itself. Connecting their research into the overall PD research agenda can lead to richer insights and avoid having their findings be lost to the larger community. PrimeD offers a structure in which research impacts classrooms directly and enhances the knowledge of the field by building strong, meaningful partnerships between teachers and researchers.

Conclusions

Teachers spend dozens of hours each year in district and school PD activities, yet most teachers believe PD is largely ineffective and is not getting any better. This belief is borne out by the lack of evidence of more effective mathematics teaching (e.g., Hiebert et al., 2005).

Few studies on effective PD include robust frameworks (Driskell et al., 2016), and there is little evidence that PD efforts regularly and systematically follow an explicit framework. PrimeD is not the only PD framework available (e.g., Desimone, 2009; Loucks-Horsley et al., 2010), but it offers structure for an enhanced level of teacher collaboration in the PD sessions and systematic, cyclic, and unique connections between whole-group sessions and classrooms. PrimeD is different because it is intended to serve as a structure for a collaborative problem-solving system that can include all stakeholders as well as support and test intensive well-focused innovations for multiple classrooms.

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