

## Chapter 83

# Leveraging a Professional Development School Project to Address Students' Learning in Elementary School Mathematics

**Drew Polly**

*University of North Carolina at Charlotte, USA*

### ABSTRACT

*This chapter presents the partnership between a university faculty member and an elementary school that started to address students' learning needs regarding mathematics. This chapter provides: a) an overview of learner-centered professional development as a framework for this Professional Development School partnership, b) a description of the various professional development activities, c) and a summary of the impact of the project on instruction and student achievement. The chapter closes with recommendations for establishing and maintaining PDS partnerships focused on addressing students' learning needs.*

### INTRODUCTION

Professional Development School partnerships provide university faculty, P-12 faculty, and teacher candidates with opportunities to deepen their knowledge and skills while simultaneously addressing the needs of P-12 students (NCATE, 2001). In optimal circumstances, university faculty are fortunate enough to design and carry out research studies in PDS sites that also enhance teachers' knowledge and skills, and impact student learning. This chapter provides: a) an overview of learner-centered professional development as

a framework for this Professional Development School partnership, b) a description of the various professional development activities, c) and a summary of the impact of the project on instruction and student achievement.

### CONTEXT OF THE PARTNERSHIP

Prior to 2008, the partner school, Sunny River Elementary School, was a PDS site that had focused its work on interdisciplinary units and service learning projects. However, after seeing

DOI: 10.4018/978-1-4666-8632-8.ch083

a steady decline in their students' mathematics achievement, the administration expressed interest in focusing on mathematics during the 2008-2009 year. The partnership between myself, who is a university faculty member, and the partner school, Sunny River Elementary School, started with a meeting in September, 2008 with school administrators. The conversation focused on how to best help students and improve mathematics teaching and learning in the school. The entire conversation was all about students – what they knew, what they struggled with, and teachers' and administrators' efforts to support mathematics. The school had recently adopted a Professional Learning Community model, which was influencing their approaches to planning, making data-based decisions, and their overall vision of effective teaching and learning (Dufour & Eaker, 1998). The school already had a formal Professional Development School relationship with the university that had focused intensively on designing interdisciplinary units of instruction as well as service learning projects. While these projects and initiatives had been successful, the recent data from the End-of-Year state assessments on mathematics caused the school's leadership team to inquire about ways to transform mathematics instruction at the school. The school's average proficient score was 51.8% and 61.9% in third and fourth grades respectively. In third grade these scores were 20 points below that state average and 12 points below the district average. In fourth grade these scores were 11 points below both the district and the state average (North Carolina Department of Public Instruction, n.d.).

During the initial conversation, there was some initial goal setting, which resulted in a meeting with each grade level to work with teachers on learning and preparing to use some reform-based pedagogies and strategies to support students' work with number sense and algebraic thinking. These meetings initially occurred during hour-long informal sessions, in which teachers would come with a list of Standards that they were preparing to teach. I would work with them, pose some math-

ematical problems or tasks that teachers would work on related to those standards, and then they would collaborate to unpack the standards and talk about ways to support students' exploration of those concepts. During these meetings teachers kept mentioning the barrier that they did not have a mathematics textbook or curriculum on which to draw resources. For each day, teachers were creating their mathematics lessons from scratch pulling from various resources, including state documents, websites, and other instructional materials that they had access. Therefore, this collaborative project took on a goal of supporting teachers' creation of lessons that included standards-based pedagogies. Standards-based pedagogies focus on problem solving, and mathematical reasoning, and align to the *Principles and Standards* written by the National Council for Teachers of Mathematics (2000). This PDS partnership focused on improving student learning outcomes in mathematics through extensive support of teachers through planning and the design and selection of instructional materials.

## **FRAMEWORK FOR THE PROJECT**

This collaborative project was grounded in learner-centered professional development (LCPD), an empirically-based framework based on empirical research documenting teacher professional development (National Partnership for Educational Accountability and Teaching [NPEAT], 2000; Polly & Hannafin, 2010). LCPD is grounded also in the American Psychological Association's learner-centered principles (APA Work Group, 1997), which were created from the knowledge base on teaching and learning (Alexander & Murphy, 1998). Previous work on LCPD (Polly & Hannafin, 2010) has identified that effective professional development: 1) addresses deficits in student learning (Hawley & Valli, 1999; Heck, Banilower, Weiss, Rosenberg, 2008; Orrill, 2001), 2) actively engages teachers in learning activi-

8 more pages are available in the full version of this document, which may be purchased using the "Add to Cart" button on the publisher's webpage:

[www.igi-global.com/chapter/leveraging-a-professional-development-school-project-to-address-students-learning-in-elementary-school-mathematics/137262](http://www.igi-global.com/chapter/leveraging-a-professional-development-school-project-to-address-students-learning-in-elementary-school-mathematics/137262)

## Related Content

---

### **An Approach to Teaching Introductory Programming for IT Professionals Using Games**

Tzvetomir I. Vassilev (2015). *International Journal of Human Capital and Information Technology Professionals* (pp. 26-38).

[www.irma-international.org/article/an-approach-to-teaching-introductory-programming-for-it-professionals-using-games/124217](http://www.irma-international.org/article/an-approach-to-teaching-introductory-programming-for-it-professionals-using-games/124217)

### **Work Stress and Psychosocial Factors in the Manufacturing Industry: A Literature Review**

Mónica Gabriela Gutiérrez Hernández, Rosa María Reyes Martínez, Aide Aracely Maldonado-Macias, Jaime Sánchez Lealand Jorge De La Riva Rodríguez (2020). *Evaluating Mental Workload for Improved Workplace Performance* (pp. 24-48).

[www.irma-international.org/chapter/work-stress-and-psychosocial-factors-in-the-manufacturing-industry/243592](http://www.irma-international.org/chapter/work-stress-and-psychosocial-factors-in-the-manufacturing-industry/243592)

### **Mediating Role of Employee Engagement on the Effect of Inclusion and Organizational Diversity on Turnover Intention: A Study on IT Professionals**

Anchal Gupta and S. Gomathi (2022). *International Journal of Human Capital and Information Technology Professionals* (pp. 1-23).

[www.irma-international.org/article/mediating-role-of-employee-engagement-on-the-effect-of-inclusion-and-organizational-diversity-on-turnover-intention/300313](http://www.irma-international.org/article/mediating-role-of-employee-engagement-on-the-effect-of-inclusion-and-organizational-diversity-on-turnover-intention/300313)

### **IT Methods and Techniques Applied to Educational Quality Enhancement**

Kerstin V. Siakas, Rita Gevorgyan and Elli Georgiadou (2011). *International Journal of Human Capital and Information Technology Professionals* (pp. 79-90).

[www.irma-international.org/article/methods-techniques-applied-educational-quality/55992](http://www.irma-international.org/article/methods-techniques-applied-educational-quality/55992)

### **Leveraging Human Capital Assets with Cognitive Computing**

Daniel J. Worden (2016). *Quantitative Multidisciplinary Approaches in Human Capital and Asset Management* (pp. 23-41).

[www.irma-international.org/chapter/leveraging-human-capital-assets-with-cognitive-computing/140613](http://www.irma-international.org/chapter/leveraging-human-capital-assets-with-cognitive-computing/140613)