In Search of Signature Pedagogy for PDS Teacher Education: A Review of Articles Published in School-University Partnerships

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ABSTRACT: ''In Search of Signature Pedagogy for PDS Teacher Education'' is a review of articles published in *School-University Partnerships* which emerged in response to Shulman's critique that we do not possess powerful, consistent models of practice that we can define and have deeply studied. To these ends, we searched for Signature Pedagogy (SP), which we define as systematic and intentionally designed teaching routines that facilitate pre-service teacher learning within PDS contexts. These are experiences that engage the learner, recognize the uncertainty associated with teaching and learning, and have the potential to shape professional habits and dispositions. After providing a conceptual framework for understanding the term Signature Pedagogy, we share the methodology that guided the review, provide examples of six emerging PDS SP, and discuss the implications of our findings for future work. In identifying these emerging Signature Pedagogy Practices, we hope to encourage conversation about identifying SP within PDS teacher education.

NAPDS Essentials Addressed: #2/A school–university culture committed to the preparation of future educators that embraces their active engagement in the school community; #4/A shared commitment to innovative and reflective practice by all participants; #8/Work by college/university faculty and P–12 faculty in formal roles across institutional settings.

Introduction

It's very hard to learn to practice without powerful consistent models of practice that we can study deeply, that we engage with deeply, that we can reflect on deeply and over which we have some control with regard to quality and character. If you had to design a system to violate all those principles, you would have designed traditional student teaching. Every candidate is assigned to a different place; there is enormous uncertainty about what they're going to see, what they're going to do, and how their own learning and performance will be monitored and guided. (Shulman, 2005, p. 16)

In this quote, Shulman identifies the lack of powerful consistent models of practice as a historical void in decades of student teaching literature. In doing so, Shulman opens an

important research space for those of us currently engaged in defining, developing, and studying professional development schools (PDS). Given that professional development schools provide clinically rich, partnership-based teacher education, PDSs are contexts where school and university teacher educators can establish routines that systematically and intentionally scaffold professional learning to develop formal and tacit professional knowledge. One way to address Shulman's concern related to the tremendous variability often present in teacher education, is to identify the Signature Pedagogy (Shulman, 2005) of pre-service teacher (PST) education within PDSs.

According to Shulman (2005), Signature Pedagogy (SP) is a mode of teaching that has become identified with preparing candidates for a particular profession (e.g., law, medicine, and education). These pedagogies become distinctive professional routines that are pervasive within the profession's curriculum and consistently present across courses, programs, and institutions. To further describe the concept, Shulman identifies SP as routines that are habitual, visible, accountable, interdependent, collaborative, emotional, unpredictable, and affect laden (Falk, 2006).

According to Shulman (2005), SPs are also characterized by uncertainty, engagement, and formation. Pedagogies of uncertainty help new teachers understand that the teaching profession requires teachers to make decisions under conditions of unavoidable ambiguity and uncertainty. Our profession recognizes that the complexity of teaching and learning relies heavily on student responses and teacher adaptations as a part of instructional decision-making. These decisions then create contingent moves and turns that are difficult to predict in advance. As a result, the teacher can try to prepare fully but decision trees will arise as the teacher navigates instruction. Pre-service teacher education requires preparing novices for this uncertainty in teaching by socializing these future professionals to the uncertain condition of practice.

Since a necessary degree of engagement is a prerequisite to teacher learning, SP in teacher preparation also includes pedagogies of engagement. Engagement requires interaction with students coupled by learning about teaching dialogically. Dialogic teaching and learning requires the exchange of ideas through collaboration and discussion with and between students, peers, and other educators. Dialogic teaching and learning is strengthened by the interplay of teaching episodes and self-reflection. Clinically rich PDS teacher preparation provides authentic opportunities for PST engagement. This engagement facilitates the development of formal knowledge, tacit knowledge, and embedded professional learning.

According to Shulman (2005), the third characteristic of SP includes pedagogies of formation. These are pedagogies that build teacher identity and character, as well as professional dispositions and values. Pedagogies of formation cultivate habits of mind that socialize future professionals to the conditions of teaching practice. These habits of mind are often referred to as dispositions in our professional literature. Although a great deal has been written about the importance of assessing professional dispositions during teacher education (Dottin, 2009; Katz & Raths, 1985; NCATE, 2001), much less has been offered in terms of how these dispositions should be taught, practiced, and coached. Shulman's emphasis on a pedagogy of formation places an expectation on developing PST professional values and identity. Although we have introduced each of these three characteristics of SP separately, they are likely to be found coexisting within a learning-to-teach routine or practice.

Shulman (2005) also argues that making explicit the routine's surface, deep, and implicit structures is an important part of understanding the routine, as well as the routine's contribution to PST learning. Surface structure is comprised of the observable, operational features of the routine (e.g., who,

what, when, and where). Deep structure refers to the embodied assumptions about the rationale for the pedagogy (e.g., under what conditions and to what ends) and an articulation of priorities related to the nature, value, and development of professional knowledge (e.g., type of knowledge sought and method of constructing that knowledge). Implicit structure is the set of professional attitudes, values, and dispositions that underpins an instructional choice (e.g., role of teacher). In an effort to avoid assuming that these routines or pedagogies are enacted in similar ways across contexts, Shulman demands attention to making these structures explicit. By defining the surface, deep, and implicit structures we are better positioned to study similar pedagogy across PDS contexts. Knowledge and articulation of these structures are essential for replication and research.

Just as the SP of medical education unfolds in teaching hospitals, clinically rich teacher education also unfolds in a unique context. Defined as places where teaching is viewed as a professional practice and where developing the skills and practices of high quality reflection and research become an important value and norm, PDSs have emerged in the literature as a special kind of school-university partnership (Levine, 2002) that can potentially offer uniquely configured clinically rich teacher education. PDSs are intended to be specifically created, inquiry-oriented contexts where school and university-based teacher educators work side-by-side to prepare the next generation of teachers (Holmes Group, 1986, 1990; NAPDS, 2008; NCATE, 2001).

In an effort to create robust contexts for teacher preparation, the National Council for the Accreditation of Teacher Educators (NCATE) and the National Association of Professional Development Schools (NAPDS) provided guidelines for gauging professional development school success (NAPDS, 2008; NCATE, 2001). However, less explicit attention has been made by teacher education faculty and their school-based partners to identify the specific kinds of uniquely configured, research-based pedagogy that support PST learning within PDSs. Additionally, little attention has been given to the specific kind of learning that occurs as a result of using this pedagogy. Since PDSs are contexts designed for engaged, authentic learning, PDSs are uniquely positioned to provide the cognitive, social, and physical spaces to identify and study the SP of clinically rich teacher preparation.

In an effort to avoid the critique that we do not possess powerful consistent models of practice that we can define and have deeply studied, PDS teacher educators would benefit by identifying the pedagogical routines that we engage within PDSs to support PST learning. We would also benefit by developing a research-based understanding of the nature of the knowledge that is constructed using specifically defined pedagogy. To these ends, we wondered what set of practices or routines characterize high quality PST learning within PDSs. To identify these routines, we reviewed the literature published in *School-University Partnerships. School-University Partnerships* is a journal we believed would include PST learning practices employed within PDS contexts. The purpose of this paper is to identify emerging SP PDS practices drawn from the PDS literature published within *School-University Partnerships.*

Literature Review Procedures

Although Shulman (2005) has engendered a great deal of attention to the conceptual underpinnings of SP in teacher education, he has left his readers with less definitional clarity about the term, making exploration and dialogue about SP complicated. For example, Shulman suggests that "teaching rounds" and "cases" might be SP for medicine and law respectively, but offers few examples of potential SP for education. Even less clarity is offered in searching for a SP of clinically rich teacher education within PDSs. While this review seeks to provide specific

illustrations of PDS SP drawn from the literature, our search required constructing an operational definition of the term SP that could be used to guide our analysis. To these ends, we utilized Shulman's work to define PDS SP as a systematic and intentionally designed teaching routine that facilitates PST learning within clinically rich contexts. The routine can be bounded for study as it seeks to: (a) engage the PST; (b) help the PST recognize the uncertainty associated with teaching and learning; and (c) potentially shape PST professional habits and dispositions.

This review of the literature began with an analysis of each article published in *School-University Partnerships*. Given that the journal began publication in 2007, we reviewed all articles in Volume 1, Issue 1 through Volume 4, Issue 2. At the time of our review, the journal had published four volumes, eight journals, and 79 articles. Welcome Remarks, President's Perspectives, Editorial Notes, and NAPDS Organizational Commentaries were not included in the analysis since we were interested in reviewing only the articles representing voices from the field. Two reviewers independently analyzed each article noting the nature of the article (descriptive/ conceptual or empirical) as well as the focus of the article. Further, we asked three additional reviewers to triangulate our independent reviews by coding a subset of the articles. Important to note is that although the term Signature Pedagogy is emerging as a characteristic of learning within a variety of professions (e.g., medicine, law, education), it did not naturally emerge as a part of the vernacular of partnership-based teacher education.[1] Also important to note is that articles did not always uniquely fit into one discrete category of focus. In these situations, the reviewers identified the predominant focus. Once each article had been independently coded, the two reviewers triangulated their

[1]With the exception of Nolan et al. (2009)

codes identifying eight categories. This initial coding created a typology that represented the articles published in *School-University Partnerships* including:

1. PDS rationale and principles
2. Stories of collaboration
3. Descriptions of stakeholder development (e.g., mentor/principal /faculty /doctoral student)
4. Instructional activities designed for PSTs that could inform our understanding of signature pedagogy
5. Impact on PK-12 student learning
6. Impact on PST
7. Program evaluation
8. Other miscellaneous topics

Table One defines the categories and identifies the articles represented within each category. Category four articles best met the definitional criteria for SP.

Because we were interested in understanding the degree to which this pedagogy is studied deeply, we also noted the number of descriptive and research articles published in the journal. Forty-eight of the 79 articles were descriptive and 31 of the articles were empirical studies. Additionally, of the 31 empirical studies, ten were quantitative, eleven were qualitative and ten were mixed methods studies. The empirical articles included program evaluation studies. Of the 79 articles, we were able to identify nineteen articles considered routines or practices that inform our understanding of PDS SP. Only five of the nineteen articles were empirical studies with the remaining fourteen articles classified as descriptive.

After narrowing to nineteen articles, the two reviewers reread these articles and independently coded the nature of the routines. When this coding was triangulated, the coding resulted in identifying six types of pedagogical routines that could inform and generate conversation about emerging PDS SP (See Table 2). These practices included:

Table 1. Analysis of the primary focus of each article published in *School-University Partnerships,* Volume 1, Issue 1 (2007) through Volume 4, Issue 2 (2010)

Group	Primary Focus Area and (Number of Articles)		
1	Primary Focus: PDS Purpose, Rationale & Principles (3)		
	1. Zeichner (2007)	2. Webb-Dempsey, et al. (2007)	3. Culan (2009)
2	Stories of Collaboration, e.g., PDS development/ Renewal/Relationship Building (24)		
	4. Patrizio, et al. (2007)	12. Curtin, et al. (2008)*	20. Sargent, et al. (2009)
	5. Horn (2007)	13. Melser (2008)	21. Foster, et al. (2009)
	6. Bell, et al. (2007)	14. Templeton, et al. (2008)*	22. Walmsley, et al. (2009)
	7. Doolittle, et al. (2007)	15. Duffield, et al. (2008)*	23. Eberly, et al. (2009)
	8. Johnson, et al. (2007)*	16. Willhite, et al. (2008)	24. Kapustka, et al. (2009)*
	9. Mann, et al. (2007)	17. Bennett, et al. (2008)	25. Doktor (2010)
	10. McKee, et al. (2007)*	18. Carver (2008)	26. Libler (2010)
	11. Greb, et al. (2007)	19. Parkinson, et al. (2009)*	27. Horn, et al. (2010)
3	Primary Focus: Descriptions of mentor/principal/faculty development (18)		
	28. Burstein (2007)*	35. Tichenor, et al. (2008)	41. Beaty-O'Ferral, et al. (2010)
	29. Toberry (2007)	36. Castle, et al. (2008)*	42. Tilford (2010)*
	30. Hammond, (2007)	37. Bler, et al. (2008)	43. Myers, et al. (2010)*
	31. Vare, et al. (2007)*	38. Yamagata-Lynch, et al. (2008)	44. Neville (2010)
	32. Gutierrez, et al. (2007)	39. Giles, et al. (2009)*	45. Hoffman, et al. (2009)*
	33. Pinkston, et al. (2007)*	40. Ramalho, et al. (2009)*	
	34. Christenson, et al. (2008)*		
4	Primary Focus: Instructional routines designed for pre-service teachers that could inform our understanding of signature pedagogy (19)		
	46. Garin, et al. (2007)*	53. Yendol-Hoppey, et al. (2009)	59. Polizzi (2009)*
	47. Walmsley (2007)*	54. Dobler, et al. (2009)	60. Slavkin, et al. (2010)
	48. Masci, et al. (2007)*	55. Stairs, et al. (2009)*	61. Wood (2010)
	49. Caprana, et al. (2007)	56. Nolan, et al. (2009)	62. Shandomo (2010)
	50. Agnew, et al. (2008)	57. Barth, et al. (2009)	63. Gartland (2010)
	51. Boatright, et al. (2008)	58. Witsell, et al. (2009)	64. Badiali, et al. (2010)
	52. Waters, et al. (2008)		
5	Primary Focus: Impact on PK-12 student learning (1)		
	65. Walker, et al. (2008)*		
	Primary Focus: Impact on PST (e.g., teacher leadership, retention, diversity-related beliefs) (4)		
6	66. Snow-Gerono, et al. (2008)	68. Pohan, et al. (2009)*	
	67. Neapolitan, et al. (2008)*	69. Castle, et al. (2009)*	
7	Primary Focus: Program evaluation (2)		
	70. He, et al. (2010)*	71. Theis, et al. (2010)*	
8	Other miscellaneous topics (e.g., assessing dispositions, understanding pk-12 students, evaluation model, tools to promote for partnership development, school-university partnership curriculum alignment, structures/resources) (8)		
	72. vonEschenbach, et al. (2007)*	74. Latham, et al. (2009)*	77. Mills (2010)
	73. Zenkov, et al. (2008)	75. Ballock (2010)	78. Field, et al. (2010)
		76. Schultz (2010)	

*Indicates a research study.

1. Inquiry
2. Focused observation
3. Mentoring and coaching
4. Co-teaching
5. Reflection on teaching
6. Integrated coursework and fieldwork

The number of times these routines emerged within the journal ranged from two to thirteen examples.

In the next section, we introduce, illustrate, and analyze the emerging six SPs. After introducing and illustrating the pedagogy, we

Table 2.   Showing the frequency and distribution of pedagogical methods discussed in articles reviewed from *School-University Partnerships*, Volume 1, Issue 1 (2007) through Volume 4, Issue 2 (2010)

Pedagogical Routine								Article Number												Totals
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	
Integrated coursework and fieldwork	X	X	X	X	X	X	X		X	X	X	X			X	X		X		14
Observation of teaching (e.g., focused and directed observation, operating theatre)			X									X								2
Mentoring or Coaching Process (guided practice)								X			X									2
Co-Teaching								X		X										2
Inquiry	X						X		X		X	X		X						6
Reflection on Teaching (e.g., portfolios, lesson reflections, video analysis, journal writing)													X					X	X	3
Totals	2	1	2	1	1	1	2	2	2	2	3	3	1	1	1	1		2	1	

1. Garin, et al. (2007)
2. Walmsley (2007)
3. Masci, et al. (2007)
4. Ceprana, et al. (2007)
5. Agnew, et al. (2008)
6. Boatright, et al. (2008)
7. Waters, et al. (2008)
8. Yendol-Hoppey, et al. (2009)
9. Dobler, et al. (2009)
10. Stairs, et al. (2009)
11. Nolan, et al. (2009)
12. Barth, et al. (2009)
13. Witsell, et al. (2009)
14. Polizzi (2009)
15. Slavkin, et al. (2010)
16. Wood (2010)
17. Shandomo (2010)
18. Gartland (2010)
19. Badiali, et al. (2010)

identify the extent to which the pedagogical practice addresses the following three frameworks. We begin by using Shulman's pedagogies of uncertainty, formation and engagement to examine the nature of the pedagogy. Next, we examine the pedagogy's surface, deep, and implicit structures (Shulman, 2005). These two frameworks, the nature of the pedagogy and the pedagogical structure, were introduced previously in this article. Because we were also interested in the knowledge generated from these emerging SPs, we conclude by discussing the extent to which the pedagogy reflects Cochran-Smith and Lytle's (1999) knowledge for, in, and of practice.

Cochran-Smith and Lytle (1999) emphasize the importance of developing teacher professional knowledge for, in and of practice. Knowledge for practice is defined as knowing about subject matter, pedagogy, and educational theory that comprise the formal knowledge bases that can lead to improved practice. Knowledge in practice is constructed within uncertain contexts recognizing particularities of everyday life in schools and classrooms. Lastly, knowledge of practice is defined as the knowledge teachers construct from systematic inquires about teaching, learning, learners and learning subject matter and curriculum, and schools and schooling (Cochran-Smith & Lytle, 1999). Given the purpose of engagement, formation, and uncertainty, these pedagogies show promise for developing the multiple knowledge types described by Cochran-Smith and Lytle.

Illustrations of Six Emerging PDS SPs

The following illustrations offer PDS teacher educators a summary of six emerging PDS SPs. By understanding these routines, as a PDS community we can strengthen our work with PSTs both within and across PDS contexts.

Inquiry

Inquiry is a pedagogy designed to support PDS PST learning that emerged through our analysis. Cochran-Smith and Lytle (1990) define inquiry as systematic and intentional study carried out by teachers to improve teaching. Systematic refers to the way teachers gather and record information to document experiences. Intentionality recognizes teacher research as an activity that is planned. Garin, Cruzado-Guerrero, and Sabra (2007) engaged interns in inquiry through the establishment of the Literacy Tech (LT) project. Within their study, the researchers articulated the surface structures that characterize inquiry as a SP for PST learning. Accordingly, "The LT project set the stage for collaboration with the PDSs through the delivery of reading and language arts methods courses" (Garin et al., 2007, p. 88). They note:

> The project aimed to prepare interns and mentor teachers to gather, analyze, and interpret reading data using handheld technology. Second, using the data collected, teacher candidates and mentor teachers were to design, deliver, and evaluate literacy learning experiences that integrated technology and enhanced literacy achievement. (p. 88)

The process that Garin and her colleagues used began with two shared questions, "How can we use handheld technology to interpret and analyze PDS student data? And how can we design technology-enhanced lessons that will improve student achievement in reading?" To answer these questions, participants gathered student data, piloted the use of technology to collect and analyze reading data, designed technology-enhanced lesson plans, delivered lessons, videotaped their teaching, and received feedback from faculty and mentor teachers. These surface structures describe the inquiry process used in this context.

Garin (Garin et al., 2007) and her colleagues also suggest some deep and implicit structures that underpin their work. They

discussed their belief that knowledge is constructed collaboratively through a team approach to inquiry premised on a common goal. They recognized the importance of diverse expertise and perspectives, as well as the significance of studying research-based innovation during implementation. As a result, we can identify implicit structures such as valuing collaboration, the construction of tacit knowledge through inquiry, and the formal knowledge base of teaching (e.g., literacy and technology).

Similarly, Polizzi (2009) also used inquiry as a pedagogical tool to strengthen PST learning. Although less detail is provided regarding the surface structures used in his PDS context, Polizzi does describe the deep and implicit structures that underpin the work. He notes:

> Legitimate peripheral participation and situated learning encompass the social and relational aspects of learning within a community of practice. They are activity theories not simply concerned with *doing* as disembodied action; rather, they refer to *doing* as object transformation, with a contextualized activity of the entire system, not an isolated activity. (p. 102)

In this way, Polizzi describes the inquiry activities, dialogue, and reflections that create a bridge between experience and learning. Under these conditions, professional learning is social and relational, situated and authentic. Polizzi continues:

> Putting inquiry in the center of the PDS organization allows for a constant flexibility and a continual questioning that form the nature of learning and knowledge. It allows for openness in understanding the possibilities of learning and the myriad conceptions and forms that learning takes... In this light, the inquiry model structures interns' activities around their actual immersion into the teaching environment—identify the issues, questions, and tension of the situated learning environment; contextualizing that

which is inquired. . .at the heart of his teaching is the idea of ambiguity, or the admittance to more than one interpretation of an idea. (p. 107)

In these excerpts, Polizzi details the type of knowledge sought and alludes to the method of constructing that knowledge. These implicit structures include: (a) knowledge as complex, (b) transformational learning and change as essential, (c) the teacher as a knowledge generator and collaborator, (d) the contextual systematic, and intentional study of one's teaching as a professional responsibility.

As suggested in these two illustrations, the process of inquiry reflects Shulman's (2005) qualities of formation, uncertainty, and engagement. Specifically, inquiry work becomes *formative* in nature as the process cultivates professional habits of mind that value and facilitate a questioning disposition and tenacity for systematic study. Additionally, participation in inquiry necessitates navigating an uncertain context, unique student needs, shifting questions and often conflicting data. Inquiry requires complete engagement as PSTs dialogue with peers, practicing teachers, and university faculty throughout the cycle. By engaging in inquiry with peers throughout a program, PSTs may begin to see inquiry as a stance towards teaching rather than a project or course task (Cochran-Smith & Lytle, 1999). Finally, inquiry demonstrates potential as a pedagogical tool that cultivates Cochran-Smith and Lytle's (1999) knowledge for, in, and of practice by utilizing existing research, implementing instructional change, and systematically studying the data collected to determine the impact of the practice and changes for future practice.

Focused Observation

The second pedagogy identified is focused observation. We selected the term focused observation to describe pedagogy that required PSTs to systematically and intentionally engage in careful observation of both others and of themselves. Masci et al. (2007) used a routine based on the medical school practice of Operating Theatre to stimulate PST learning through focused observation: "The purpose of Operating Theatre has always been to provide intensive modeling by veteran in-service teachers coupled with frequent feedback for pre-service teachers" (p. 79).

In this case, the Operating Theatre emerged out of mentor teachers' belief that they needed to provide PSTs with quality models of instruction. Their description of the Operating Theatre at work includes surface structures designed to help PSTs improve their pedagogical skills. The surface structure of the Operating Theatre include:

Expert in-service teachers—after reading research and presentations of a targeted instructional strategy—demonstrate this practice to observing PSTs as part of their normal PDS classroom instruction. University faculty collaborate with school faculty on the selection of the instructional strategies to model and on follow-up sessions, which allow the pre-service teachers and the school and university faculty to share opinions and develop activities that the pre-service teachers can use in their student teaching experience. We have found through several years of experience that knowing the why behind the practice is critical to the successful transfer of instructional strategies; the interactive discussions before and after the demonstration are central to this process. (Masci et al., 2007, p. 78)

Masci et al. (2007) specifically describe surface structures needed to enact the pedagogy. They outline an eight-step, cyclical process comprised of PST preparation for observation. This process begins by PSTs reading specifically chosen materials to inform the observation. Next, the PSTs engage in discussion of the readings in anticipation of the observation. Once this pre-observation work is completed, the PSTs observe an expert in-service teacher demonstrate the strategy and take observation notes using a specifically designed focused

observation guide. This observation is then followed by "a debriefing session, a videotaping of pre-service teachers demonstrating the technique, and finally, a written reflection" (Masci et al., 2007, p.80). At this point the PSTs move from observing others to observing self through the videotaped lesson.

Deeper structures must also be in place to support effective implementation of this pedagogy. For example, the embodied expectation that "all mentors of pre-service teachers would be able to model research-based strategies" (Masci et al., 2007, p.80), led to the appointment of a demonstration teacher. The stakeholders identified the dilemma that PSTs often observed uneven models of proficiency, as some mentors "knew how to utilize the strategies, and others were effective at some strategies but not others" (Masci et al., 2007, p. 80). As a result, focused observation required in-service teachers most familiar with the use of a specific strategy to assume the role as the demonstration teacher, modeling the strategy, and explaining the rationale behind the strategy's use. Further, this method was grounded on the belief that the PDS's mission was to create a learning community for all stakeholders involved, ensuring the development of professional knowledge as in-service teachers collaborated before, during, and after their observations with the PSTs. The routine relied on in-service teachers who maintained "current with research-based practices" (Masci et al., 2007, p.82). The deep structures of this pedagogical routine included: (a) importance of expert models in knowledge construction, (b) learning by observation, (c) the importance of linking the research base and practitioner knowledge base, (d) the important link between learning to teach by observing more experienced others and implementing those practices oneself.

Finally, the appointment of in-service teachers as mentors and demonstration teachers reflects an implicit structure that the role of the teacher is that of a life-long learner. Embedded in this model is the need to possess proficiency with effective strategies, evolve in his or her use of research-based practices, and explain what and why specific strategies are used. One in-service teacher shared the value of the routine.

> It always happens that something new pops up that I have not considered before, or my new group of children presents a challenge that, if I were not demonstrating for the [PSTs], I would possibly gloss over. It helps me increase my skillfulness, and I learn so much from the discussions about what the interns saw versus what I thought I was doing. (Masci et al., 2007, p. 82)

As the in-service teacher models the relevance of this dialogue, the PST simultaneously learns that "Operating Theatre has allowed introspection through outside observation and seeing effective teaching in practice" (Masci et al., 2007, p.83).

Shulman's (2005) pedagogies of uncertainty, formation, and engagement are reoccurring and evident throughout the Operating Theatre's eight-step cyclical process. Observing demonstrated strategies and videotaping their teaching provides PSTs the opportunity to see that teachers act often under unavoidable and unpredictable conditions within PDS classrooms. Knowledge in practice is constructed as strategies may or may not be enacted as planned and, regardless, teachers must respond accordingly. The collaborative milieu uniquely provided by the PDS clinical classroom ensures that pedagogies of engagement and formation are continuously employed. In the classroom, the PST actively interacts with students and engages in analysis of teaching practices with university faculty and in-service teachers. Masci et al. (2007) suggest that, "the healthy PDS provides an optimal environment for an open and candid exchange of ideas, which is at the heart of the Operating Theatre instructional model" (p. 83). This continuous dialogue about the observation advances the PST's construction of knowledge in practice, while knowledge of practice advances through reflection and analysis. Further, this cycle shows promise as a pedagogy of formation, since discussions encourage dialogue that fosters

dispositions and values essential to the development of PSTs' character and identity.

Coaching/Mentoring

The third pedagogy that emerged was coaching and mentoring. Within this review, coaching is defined as a pedagogy provided by someone other than the classroom teacher to the PST. Coaching is characterized by interaction that targets improving teaching and learning. Similarly, mentoring also relies on dialogue to promote teaching and learning. However, in the case of mentoring, the dialogue typically occurs between the PST and the classroom teacher. These two pedagogical tools are used to facilitate PST learning within PDSs. Polizzi (2009) describes dialogue as the surface structure that underpins the coaching and mentoring that occurs in his PDS context. In this case, the dialogue is specifically focused on helping PSTs explore professional ideas:

> Interns, mentors, and Dr. Jameson discussed their core professional ideas, experiences, and questions that guided their practice throughout the year. Asking, "What questions, ideas, or experiences are at the heart of your teaching?"—specifically within the context of the PDS—offered insight and clarification to the interns and PDS communities' understanding of what it means to be a teacher. . .. The core professional ideas, experiences, and questions start as immaterial and then become material that composes the individual and collective strand of the unique PDS textile. (Polizzi, 2009, p. 108)

This example pays significantly less attention to the specifics of the surface structures but does suggest a deep structure. The deep structure suggests that PST learning emerges from the PST experiences, and that dialogue by a mentor or coach supports the processing of those experiences to generate professional learning. Coaching in this context recognized

the PDS's value of authentic learning opportunities, collaboration and dialogue, as well as transformation.

In another example, Masci et al. (2007) describe surface structures of the coaching that is conducted after the Operating Theatre. During this time, the PSTs are provided with frequent feedback from their mentor and university coach as they implement a similar practice. These coaches and mentors also review a teaching video of the PSTs as well as the reflections on their teaching. Given that the mentors are specifically selected for their specialized knowledge, the deep structure requires that mentors demonstrate links between what they say and what they do in their practice. In the Operating Theatre, there is an assumption that the mentor or coach possesses expert knowledge to be shared with a less experienced PST.

Similarly, within the "Methods of Teaching Elementary Mathematics" course, Walmsely, Bufkin, and Rule (2007) indicate that coaches scaffolded PSTs' learning related to meeting diverse students' needs. The course began by familiarizing students with the content and context. The PSTs followed this step by collecting and analyzing assessment data under the guidance of their mentors and university faculty coaches. As the PSTs implemented the lessons, they received oral and written feedback from both the mentor teachers and the university faculty.

Although these surface structures give the reader a sense of the dialogue focus, the deep structures that underpin this coaching are less explicitly communicated. Less is known about the nature of the relationship between the mentor/coach and mentee, the roles of the mentor/coach and mentee in the learning process, the mentor/coach knowledge about mathematics teaching, or the distinction made between coaching and evaluating. Finally, implicit to this coaching and mentoring work is the assumption that PSTs will develop a more sophisticated knowledge of how to work with diverse students by dialoguing with a more experienced professional.

Yendol-Hoppey and Dana (2009) also discuss mentoring as a pedagogical tool to

facilitate PST learning. In their article, they provided two illustrations of inquiry-oriented mentoring that depict the surface structure comprised of identifying a dilemma followed by systematic and intentional study by the mentor with the mentee. The pedagogical tool utilizes the inquiry cycle of data collection and collaborative data analysis. The article offers a rationale for this mentoring pedagogy and describes the nature of the professional knowledge constructed. This offers insight into the deep structure of mentoring:

> The ultimate goal of engagement in teacher research is to create an inquiry stance towards teaching…Because of mentoring's complexity, it is natural and normal for many problems, issues, tensions, and dilemmas to emerge for mentor teachers as they work with novices. An inquiry-oriented approach to mentoring acknowledges this complexity. (Yendol-Hoppey & Dana, 2009, p. 7)

Implicit in this approach to mentoring is that mentoring is inquiry-oriented, relational, requires engagement by both mentor and mentee, and must be tailored to individual PST learning needs. However, missing from this article is attention to presenting evidence that demonstrates its impact on PST learning.

Across these three examples, the terms coaching and mentoring are often used without clearly defining the observable, operational surface structures that are present beyond general dialogue. In general, these examples of coaching and mentoring, cited as powerful learning supports within the articles, made assumptions that coaching and mentoring have a shared definition and process that is understood across contexts. Readers could benefit by being provided more details about the type of knowledge sought, method of constructing the new knowledge, or the role of the mentor and learner.

Given what we know about coaching and mentoring, the goal of each is to engage PSTs in learning at the elbow of a skilled professional. This induction at the elbow of a skilled

professional is a formative activity in that PSTs receive support from a colleague familiar with the field and nuances of the profession. Coaching and mentoring require continuous engagement and learning within an uncertain context with shifting variables. As PSTs receive coaching and mentoring by a more experienced professional, the assumption is that they are likely to be provided opportunities to strengthen their knowledge for, in and of practice. More research in this field will help us understand the impact of specific coaching and mentoring models on PST learning.

Co-Teaching

Co-teaching is another pedagogy designed to enhance PST learning that emerged within the analysis. Co-teaching is defined as two or more teachers working together in the same classroom sharing responsibility for student learning. Accompanied by the work of Badiali and Titus (2010), Stairs et al. (2009) explored co-teaching as a tool for supporting and strengthening PST learning. Within the Urban Immersion Program, Stairs et al. described the co-teaching structures within their program:

> The idea of placing two to three student teachers in classrooms was one solution that the school-university partners decided to employ beginning that fall. Rather than spending the majority of classroom time observing, as is typical in BC [Boston College] early field experiences, BC students in Urban Immersion would be expected to get involved with teaching individual, small groups, and whole classes of [high school] students from day one. (p.76)

This excerpt describes the surface structures of a PST co-teaching with another PST within this program. However, fewer details are offered regarding the specific nature or deep structures that support the classroom level collaboration. They noted within the study that through scaffolded support within the high school classroom, co-teaching became a tool for

developing reflective practitioners and critical thinkers, creating enhanced comfort in urban classrooms. The implicit structure underpinning this pedagogy is that collaboration with a peer would facilitate White middle class PSTs' ability to teach in urban contexts and become reflective practitioners.

In their article on co-teaching, Badiali and Titus (2009) provide surface structure details specifically describing six models of co-teaching comprised of mentor and PST pairs. They assert that the deep structures of collaborative dialogue around planning for, implementing, and assessing instruction contribute to both PST and elementary student learning. Finally, the implicit structures of co-teaching indicate valuing collaboration and professional dialogue as learning tools.

As indicated, the pedagogy of co-teaching requires engagement with students and colleagues, teaches the importance of collaboration as a part of professional formation, and recognizes that professional learning occurs under uncertain contexts with new variables consistently being introduced to the teaching and learning context. Through co-teaching, professionals would have the opportunity to support each other's development of knowledge for practice as they explore formal knowledge in preparation to teach together. Co-teaching also shows promise as a tool for generating knowledge in practice as two educators teach together. The collaborative dialogue concerning the successes and failures of their co-teaching efforts that follows the act of teaching shows promise in generating knowledge of practice.

Reflection Tools

Throughout the articles, a variety of reflection tools emerged, creating reflection as a potential SP that stimulates PST learning within PDS contexts. These reflection tools included, but were not limited to, portfolios, lesson reflections, video analysis, and journal writing. Reflection tools are defined routines that enable teachers to recognize, analyze, and learn about what works and what doesn't work in their

teaching. Reflection tools provide a process of self-evaluation.

In the article, *The Role of Critical Reflection in Teacher Education*, Shandomo (2010) describes a variety of tools that facilitated PST understanding of teaching style, practices, and effectiveness. These reflections on practice included portfolios, summative reflections, written reflections on teaching, video self-analysis, and journal writing. Each activity is described at the surface structure level in the article. For instance, in order to build knowledge for practice, the author explain:

> After our class discussion, students write reflective journals on each reading assignment. In their reflections, they must show what new knowledge they learned, and they must discuss how they will apply their understandings in their field placement. (Shandomo, 2010, p. 104)

Those connections to teaching practice are then extended as PSTs are expected to reflect on their own teaching, as well as observations of others in the field.

Shandomo (2010) articulates the deep structures that underpin the rationale for PSTs' critical reflection within their partnership context. Specifically, he situates his work using Cranton's (1996) conception of critical reflection:

> Critical reflection is the process by which adults identify the assumptions governing their actions, locate the historical and cultural origins of the assumptions, question the meaning of the assumptions, and develop alternative ways of acting. (Shandomo, 2010, p.101)

Shandomo continues to provide knowledge of the deep structures by articulating that "This work is based on constructivist theory, which emphasizes the idea that learners construct knowledge for themselves" (p. 102). The implicit structure recognized in this approach is that as learners, teachers are knowledge

creators, and that knowledge requires problem posing and questioning the status quo. Additionally, the implicit assumptions also include that learning through critical reflection will lead to more "culturally informed" PSTs who are able to deliver effective instruction to all students (Shandomo, 2010, p.102).

In analyzing the pedagogy offered to generate critical reflection, we can assert that these activities require PST engagement within uncertain and complex classroom contexts. Engagement in this case is engagement between lived experience (e.g., teaching episode) and contemplation about that experience (e.g., self). In this article, Shandamo (2010) also recognizes that the activity of critical reflection is intended to facilitate the formation of culturally informed professional dispositions and values. The process of critical reflection can potentially develop knowledge of practice as PSTs are expected to use a critical lens to reflect on the degree to which they are meeting the needs of all students.

Integrated Coursework and Fieldwork

Integrated coursework and fieldwork refers to the systematic and intentional design of methods course content that links theory and research typically taught at the university to the field. All but five of the SP articles identified in this review provided examples of integrated coursework and fieldwork as a key pedagogical tool for enhancing PST learning. Importantly, many of these articles combined multiple SPs to create the coursework to fieldwork connection. This combination sets the integrated coursework and fieldwork pedagogy apart from the other five pedagogy already explored. In the first volume of *School-University Partnerships*, Zeichner (2007) forewarned that, "moving methods classes to schools may or may not be any different or better than traditional ways of providing these teacher education components, depending on how the work is implemented" (p. 15). To provide examples of integrated coursework and fieldwork that is conceived of differently because of the commitment to PDS teacher education, we highlight the work of Stairs et al. (2009) and Walmsley et al. (2009).

In the Urban Immersion field experience, Stairs et al. (2009) restructured the early field experience from primarily an opportunity to observe instruction to systematic involvement in teaching individual, small groups, and whole classes of high school students. The authors described these structural features:

> In the morning, they [PSTs] attend an introductory course titled "Secondary Curriculum and Instruction"; they then work in classrooms with a partner all day and use 25 minutes directly after school to debrief with cooperating teachers; after that, they return for the second half of the curriculum and instruction course. . . The afternoon course was co-taught by the professor and an exemplary teacher from [the high school]. The purpose of the afternoon session was to connect theories from the morning session with practices that the student teachers experienced in classrooms that day. . .Work in classrooms and assignments related to this work (i.e., journal entries, focused observations, lesson reflections) fulfilled students first early field experience. . . (Stairs et al., 2009, p.77)

As indicated, the coursework is structurally tied to the fieldwork by intentional design. PSTs instruct individual, small groups, and whole classes. They co-teach high school students, debrief with cooperating teachers serving as mentors, and have seminars that are co-taught by university and school faculty. These details illustrate the surface structures that comprise the integrated coursework and fieldwork pedagogical approach.

Also discussed in the Stairs et al. (2009) article are the deep structures that underpin this pedagogy of teacher education. For example, the authors specify that these experiences in an urban classroom are essential to the knowledge construction of the White middle-class PSTs. They note that, "there is specialized knowledge that effective urban teachers possess that goes

beyond knowing content and knowing the pedagogical strategies for teaching the content" (Stairs et al., 2009, p.77). This underlying assumption provides a rationale for the integrated coursework and fieldwork. They believe that by providing contextualized pedagogy of scaffolded learning to teach opportunities within an urban school, PSTs can construct theory to practice connections. These deep structures reflect how they perceive that teachers develop the complex knowledge essential to effectively teaching in urban contexts. The implicit structure within this study includes this group of teacher educators' belief that White PSTs are unprepared for teaching in urban contexts. Further, by learning to move between theory and practice through integrated coursework and fieldwork within this urban context, they assess that PSTs will learn to facilitate learning for all students. Given that this is not only a description of their pedagogy but also a research study, findings suggest that these assumptions were accurate and that integrated coursework and fieldwork did indeed strengthen White PSTs' understanding of urban schools.

Walmsley et al. (2009) also provided an example of PDS PST learning that integrated multiple SPs to bridge coursework and fieldwork. Walmsley et al. (2007) integrated coursework and fieldwork through the Strategies for Inclusive Classrooms' course. In this class, the university faculty began by providing foundational knowledge *for* practice focused on teaching students with disabilities through seminars that built necessary content knowledge about children with disabilities (e.g., learning disabilities, behavior disorders, hearing impairments, intellectual disability, and attention deficit hyperactivity disorder). Next, the instructors worked with school faculty, using school and classroom data as well as school speakers, to develop PSTs' understanding of the context, specific student population, and expectations for participation during the seminars. The school special education faculty then matched PSTs with students with disabilities who they believed would benefit from tutoring. Prior to tutoring them, the PSTs engaged in focused observation of the students where they collected

data about how the student functioned in an inclusive setting. Although the authors do not specifically name this as inquiry, the focus on understanding a specific student's learning needs by collecting and analyzing data, shares many characteristics of the inquiry process. The data were then shared with classroom teachers, allowing them to mentor PSTs by posing questions and offering insight into how they could best meet the needs of the children. This experience helped the PSTs strengthen their knowledge *for* practice by preparing them to better understand the unique student needs, as well as potential interventions that can support student learning.

Next, the PSTs began the tutoring process. During the tutoring sessions, university faculty met with the PSTs to coach them by observing and providing them feedback. The coaching also included reviewing student progress and problem-solving instructional challenges. Coaching and mentoring during the tutoring experience helped PSTs develop knowledge in and knowledge of practice.

In these examples, teacher educators developed integrated coursework and fieldwork using focused observation, elements of the inquiry process, and coaching/mentoring. In combination, these pedagogical approaches collaboratively offered by university and school-based teacher educators created links between theory and practice, building knowledge for, in and of practice. This integrated example recognizes that the pedagogy for learning to teach includes uncertainty, engagement, and formation. PSTs are engaged as they collaborate with others, reflect on experiences, deliver instruction, and make sense of data. Through the process of inquiry they learn the uncertainty and complexities of observation, teaching, and student learning. These experiences are formative, as PSTs begin to see themselves as problem solvers, and create professional habits of systematically studying their teaching. In sum, these scholars combined and linked a set of routines that targeted generating knowledge for, in and of practice, while also demonstrating engagement, uncertainty and formation (Cochran-Smith & Lytle, 1999; Shulman, 2005).

Discussion and Implications for Future Work

This review of articles published in *School-University Partnerships* represents an initial search for a set of pedagogical routines that might be considered as SPs for PDS based teacher preparation. This review suggests that we have begun to define, use, and, in some cases, study these routines within PDS contexts. However, we need to establish more specificity by providing the surface, deep and implicit structures to more fully understand how these routines are defined and used. Additionally, we have few routines published within *School-University Partnerships* that present a research-based understanding of the nature of the knowledge generated using these routines. Finally, no evidence from this review demonstrates that the PDS community has studied these routines across contexts.

One of the complexities associated with this analysis was the challenge of identifying the deep and implicit structures of each routine. When surface structures were present, they were typically easily identified. However, identifying and distinguishing between deep and implicit structures was not as straightforward. The researchers of this study found themselves making assumptions as they tried to uncover and name the deep and implicit structures guiding the pedagogy. Although not a comprehensive list, the deep and implicit structures that could be culled included the importance of: authentic tasks, applied contexts for practice, engaged learning opportunities, and theory to practice connections as conditions for learning. In each routine, the implicit goal appeared to be the development of complex professional knowledge, and in most cases integrated a variety of professional knowledge types. However, most often this was not made explicit. Additionally, the underlying assumptions also suggest that the emerging SPs recognize the role of the teacher as that of problem poser, research consumer, data consumer, knowl-edge constructor, change agent, life-long learner and collaborator, all while being responsible for student learning. Given the commonalities that emerged, teacher educators could strengthen future contributions to our understanding of SP by making the underlying structures and knowledge generation goals of the routine clear to other educators, both locally in their work with colleagues and globally in their dissemination.

Zeichner (2007) initiated the conversation about the importance of understanding teacher education pedagogy, when he stated:

> In my view, we have a problem in teacher education- namely, that of advocating concepts and practices such as 5-year programs, reflective teaching, action research, mentoring, and so on, without always discussing and illuminating the conditions that exist in studies that show desired outcomes. The messages we are sending is that these practices- action research, reflective teaching, and, yes PDSs—are necessarily different from and better than what went on before. Although in some cases that is true, in others, it is not, and what is described as something new and innovative is sometimes no different from what went on before. (p. 15–16)

The conditions that underpin the six SPs described in this review begin to address Zeichner's question about whether they are different from and better than what went on before in teacher education. Given the common commitments to engagement, uncertainty, and formation, and the fact that they occur under specific conditions and within contexts specifically created to actualize these types of routines, we believe the six PDS SPs do show promise as routines that are different from those which came before. However, increasing effort needs to be given to defining and studying SP in order to specifically address and avoid Zeichner's critique.

Although these six emerging SPs recognize the importance of formation, uncertainty, and engagement as well as various knowledge types in the preparation of teachers, we are just beginning to identify "a suite of SPs that are routine, that teach people to think like, act like, and be like an educator," and that support us in building "programs of teacher education around these kinds of signature pedagogies" (Shulman, 2005, p. 15). Establishing this type of pedagogy will likely reduce the enormous variation as well as heighten the quality of teacher preparation within PDSs today.

To encourage this work of creating PDS SP, it is essential to identify and secure appropriate resources that build knowledge of these practices across school and university based teacher educators, as well as within and across PDS contexts. Additionally, the nature of teacher education experiences for PSTs needs to be open for reconceptualization. With an emerging SP that links formal knowledge and tacit knowledge construction, the practice of PSTs spending 3 years "learning about teaching" on campus followed by a year or less in the field "learning how to teach," may no longer be considered effective or authentic (Roth, 1994). Additionally, simply placing PSTs in the field across semesters without systematically and intentionally developing new pedagogy that links course content and authentic practice, also leads to limited growth (Neville, Sherman, & Cohen, 2005). As evidenced in these routines and practices, a more authentic, on-going, embedded clinical approach is needed to the preparation of new teachers (Darling-Hammond, 1994; Goodlad, 2004). These routines are beginning to emerge in our PDS literature.

Signature Pedagogy as discussed in this article has various limitations as well as implications for future research. First, due to the lack of specificity in the definition of SP, the researchers were likely limited by their understanding of the definition from which they worked. Second, this analysis was limited to studies published in a single journal, *School-University Partnerships*. Future research should include reviews of other journals committed to publishing the work of scholars engaged in teacher education. Third, the analysis was limited to journal articles representing teacher education in the United States. Future reviews should include a comparison of teacher education pedagogy in partnership contexts internationally. Fourth, an analysis of the pedagogy from outstanding award winning, clinically rich teacher education programs would also help inform our knowledge of SP. Finally, researchers would benefit by working with colleagues across contexts to research pedagogy that share similar structural dimensions, in an effort to create some common SP practices. Shulman noted the importance of creating Signature Pedagogies that cross programs and universities, when he noted:

> Wherever you go in education, people want you to understand that what they are doing is totally different from what is done elsewhere...That's a pity because the field could benefit from a little more uniformity and a little less individuality. (Viadero, 2005, p.1)

Perhaps it is time for teacher educators across the PDS community to heed Shulman's recommendations and come together to identify, collaboratively research, and make public our common practices. Shulman advocates that establishing SP might ensure that beginning teachers, regardless of the PDS in which they are prepared, have been exposed to a core set of practices that PDS teacher education experts agree are beneficial. SUP

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