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WHAT IT MEANS TO BE A PROFESSIONAL DEVELOPMENT SCHOOL

A statement by the Executive Council and Board of Directors of the National Association for Professional Development Schools, www.napds.org, April 2008

The Nine Required Essentials of a PDS© are:

1. a comprehensive mission that is broader in its outreach and scope than the mission of any partner and that furthers the education profession and its responsibility to advance equity within schools and, by potential extension, the broader community;

2. a school–university culture committed to the preparation of future educators that embraces their active engagement in the school community;

3. ongoing and reciprocal professional development for all participants guided by need;

4. a shared commitment to innovative and reflective practice by all participants;

5. engagement in and public sharing of the results of deliberate investigations of practice by respective participants;

6. an articulation agreement developed by the respective participants delineating the roles and responsibilities of all involved;

7. a structure that allows all participants a forum for ongoing governance, reflection, and collaboration;

8. work by college/university faculty and P–12 faculty in formal roles across institutional settings; and

9. dedicated and shared resources and formal rewards and recognition structures.

School–University Partnerships: The Journal of the National Association for Professional Development Schools (NAPDS) is published by the NAPDS as a service to members of the Association and others concerned with partnerships between higher education and P-12 schools and their communities. For association information please refer to http://www.napds.org.

School–University Partnerships: The Journal of the National Association for Professional Development Schools is nationally disseminated and blind-refereed. Each issue contains articles written by both university and school educators, usually in collaboration with each other, and highlights policy and practice in the school-university partnership.

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Rebecca West Burns
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Raven Robinson
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Abstract: In this article, the authors discuss the importance of the relationship between action research and teacher inquiry, within the context of professional development school settings. Considering the scope of the relationship, the authors provide a brief overview of articles, presented in this issue, that substantiate the need and impact of continuing teacher inquiry—influencing stakeholders to contribute in the advancement of purposeful partnerships. The authors aspire to encourage others to sustain the vitality of teacher inquiry, through the lens of implementing more professional development opportunities, with the effect of heightened student learning and stronger school-university partnerships.

KEYWORDS: professional development schools, PDSs, school-university partnerships, teacher inquiry

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9. Dedicated and shared resources and formal rewards and recognition structure.

Welcome to the *School-University Partnerships Journal* themed online issue, Teacher Inquiry in Professional Development Schools: How it Makes a Difference. When we use the term teacher inquiry, we mean teachers intentionally engaging in the systematic study of their own practice (Cochran-Smith & Lytle, 2009; Dana & Yendol-Hoppey, 2014). Teacher inquiry, as a form of practitioner research, in PDS can assume many forms. Some teacher inquiry opportunities are situated in the PDS site where teacher candidates, mentor teachers and university faculty work together to solve problems, implement new teaching strategies and/or study options for change by reading and discussing professional books and articles. The titles of these teacher inquiry opportunities may have a variety of names such as inquiry groups, book clubs, study groups or PLCs. Likewise, teacher candidates may be required to conduct teacher inquiry—either independently or collaboratively, with peers or mentor teachers. The diversity in whom conducts teacher inquiry and the form teacher inquiry assumes, perhaps, illustrate the complexity of teacher inquiry in PDS.

This special edition for *School-University Partnerships* will take a step towards reviewing what teacher inquiry looks like in professional development schools. The authors explore the role of teacher inquiry in professional development schools and describe what it looks like from the view of various stakeholders in PDS, including, but not limited to administrators, liaisons, university-based teacher educators, mentor teachers, and teacher candidates. This issue also provides examples of teacher inquiry, as well as addresses the impact of teacher inquiry, on both students and those conducting the research.

We are excited and honored to open this issue with an invited article by Nancy Fichtman Dana, from the University of Florida. In her powerful piece, she reflects on the purpose, problems, and potential teacher inquiry offers to the PDS community, through the discussion of three tensions experienced by those who inquire within a PDS partnership: university research versus practitioner research, inquiry as project versus inquiry as stance, and inquiry as real versus inquiry as ideal.

The first four articles, in this online issue, focus on research about action research in PDSs. As a form of practitioner research, action research is a deliberate, solution-oriented investigation that is group or personally owned and conducted—characterized by spiraling cycles of problem identification, systematic data collection, reflection analysis, data-driven action taken and finally problem redefinition (Kemmis & McTaggart, 1992;2000). It is connected to teacher inquiry because it has the potential to serve as a teacher-directed form of professional development (Zeichner, 2007). Eva Garin, one of the co-editors of this journal and the PDS Coordinator for Bowie State University, describes a study she conducted, which compares the action research experiences of PDS and non-PDS teachers. George Mason PDS partners Dodman, Groth, Ra, Baker, and Ramezan investigated how teacher candidates perceived the influence of action research in their teaching, prior to and one year after graduation. Catelli, Carlino, and Petraglia describe their collaborative Professional Development School action research, aimed at changing and improving classroom teaching, considering the impact on student learning and achievement. Benson, Curlette, Ogletree, and Hendrick describe research administered through Georgia State University, their Institutions of Higher Education partners (Albany State University, Columbus State University, and Georgia Southern University) that served both urban and rural local education agencies. This PDS approach, Teacher-Intern-Professor (TIP), involves a university professor, mentor-teacher, and intern, working together on a unit of instruction.

In the next section, we include two articles which focus on how to conduct inquiry in PDSs. Roselle, Hands, Anagnostopoulos, Levine, Cahill, Kuhn, and Plis identify the key components of their simultaneous inquiry model through the development of a Core Practice Study Group. University of Georgia PDS Partners, Andrews, Thompson, Naughton, and Waters share their program, Genius Hour, which serves as a framework for teacher inquiry in a PDS. Through Genius Hour, teacher candidates, and practicing teachers in a PDS identify questions grounded in their passions for teaching and learning and explore relevant and meaningful questions about teaching and learning while investigating those questions, reflecting on results, and generating new questions.

The next two articles provide samples of teacher inquiry in professional development schools. Rogers, Rogers, Choins, and Cox—PDS Partners from Baylor University—describe two action research projects completed under the direction of an eighth-grade mathematics teacher, who served as the mentor teacher for two teacher candidates from Baylor University's School of Education. PDS Partners from Columbus State, Bentley and Gray, describe how a high school classroom became a true learning laboratory for participants within a professional development school. Specifically, the classroom served as a "hospital round," in which the teacher candidates, mentor teacher, and university professor "diagnosed" a student learning issue, "prescribed" a teaching strategy, and made careful observations of the "patient" to see if the prescribed strategy was effective.

We conclude this issue with two case-in-point articles, which further our understanding of the role of teacher inquiry in PDS. Madden describes how the PDS learning community in Maryland succeeded in creating a culture of teacher inquiry. Henry, from the University of Kentucky, along with Hyde (Athens State University) and Kennedy (Ohio University), focus on the benefits of teacher inquiry and strong clinical partnerships at the core of clinically rich educator preparation and discuss implications for teacher education programs, partnership development, and P-12 student learning.

We hope that after reading this special issue of *School-University Partnerships,* each of you will walk away with a new respect for the role of teacher inquiry, in PDS, as a vehicle for hands-on professional development, improving student learning, and supporting PDS partnerships.

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Practitioner Inquiry and PDS Work: A Reflection on 25 Years of Purpose, Problems and Potential

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Abstract: This article reflects on the purpose, problems and potential inquiry offers to the PDS community through the discussion of three tensions experienced by those who inquire within a PDS partnership: (1) University Research versus Practitioner Research; (2) Inquiry as Project versus Inquiry as Stance; and (3) Inquiry as Real versus Inquiry as Ideal. After describing each tension, the author concludes that it is when navigating these tensions, rather than resolving them, that learning and growth happens for all members of the PDS community.

KEYWORDS: professional development schools, PDS, practitioner inquiry, partnerships, tensions, school-university partnerships

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Introduction

The more things change, the more they remain the same.

-French Proverb

When I stepped into my first position in higher education a quarter-century ago in 1992, the importance of building strong school-university partnerships to engage in Professional Development School (PDS) work was receiving heightened attention across the nation. At the time, the Holmes Group (1990) had made a call for the creation of professional development schools, with one guiding principle being that they must include a commitment to making reflection and inquiry a central part of the work. Having engaged in collaborative inquiry with a team of elementary school teachers and their principal for my own dissertation work (see Dana, 1991), as well as supervised student teachers in that same building, I knew that the PDS work being called for and practitioner inquiry were a match made in heaven. As a new assistant professor, I worked over a five-year period to build relationships between town and gown (The State College Area School District and the Pennsylvania State University) where I was employed at the time, and during the 1998-1999 school year, launched a pilot professional development school program, that included engagement in inquiry as its signature feature (see Dana & Silva, 2002; Dana & Silva, 2004; Dana, Silva & Snow-Gerono, 2002; Dana,

Smith & Yendol-Hoppey, 2011; Dana, Yendol-Hoppey & Snow-Gerono, 2006; Silva & Dana, 2004; Yendol-Hoppey & Dana, 2008). I have been studying, coaching, doing, and teaching about the process of inquiry ever since. On the 25-year anniversary of my first experience intertwining inquiry within the professional development school, in this article, I offer my reflections on the purpose, problems and potential inquiry offers to the PDS community through the discussion of three tensions I have been navigating and continue to navigate as I have engaged in this work over time: (1) University Research versus Practitioner Research; (2) Inquiry as Project versus Inquiry as Stance; and (3) Inquiry as Real versus Inquiry as Ideal.

University Research Versus Practitioner Inquiry

Purpose

Included in the NAPDS statement on what it means to be a professional development school is the following required essential: *Engagement in and public sharing of the results of deliberative investigations of practice by respective participants*. While university-based teacher educators enter PDS work with training and experience as educational researchers who use quantitative and qualitative research methodologies to study educational practice, this approach to "deliberative investigation of practice" does not make sense for the teachers and administrators within a PDS. Practitioners in the PDS need a research methodology that matches the goals and purposes of their work to engage in deliberative investigation. Practitioner inquiry, defined as systematic, intentional study by educators of their own practice emerges as an important mechanism to generate knowledge from practice within the PDS, complementing the kinds of research produced at a university (Cochran-Smith & Lytle, 2009). The cyclical process of inquiry begins with educators defining a wondering (a burning question) they have about practice that emerges from a real-world problem, or dilemma, and is followed by collecting data to glean insights into that wondering, analyzing data, synthesizing and sharing with other practitioners what was learned, and taking action for change and improvement (Dana & Yendol-Hoppey, 2014). In contrast to a university researcher's investigations aiming to have broad impact through journal publication, a practitioner inquirer's investigations aim for local impact on one's own classroom and/or school to improve life and learning conditions for the children and the adults within them.

Problem

Throughout the years I have spent studying, coaching, doing, and teaching about the process of inquiry, I have found that too often, inquiry is interpreted as teachers, principals, and teacher candidates becoming "Mini-Me" versions of university researchers, engaging in an experiment to "prove" a particular teaching strategy is of worth. If the investigations PDS teachers, principals, and teacher candidates are conducting in classrooms mirror exactly the type of process-product quantitative research produced at a university by professors in a miniature form, we are not doing any service to teachers or to schools. Practitioner inquiry is not about a controlled setting, an experiment with a control and treatment groups, crunching numbers, sample sizes, populations, generalizability, or an objective scientist removed from the subjects of study so as not to contaminate the findings.

Rather, practitioner inquiry is a natural extension of good teaching: observing students closely, analyzing their needs, and adjusting one's teaching accordingly. The investigations practitioners do are not about proving, but *im*proving practice. The problem is that in the university setting, this kind of research can be easily misunderstood or dismissed.

Potential

As a PDS community, we are uniquely positioned to educate others about the value of practitioner inquiry as a complement to university-based research. To aid in this process, I often invoke the words of Lawrence Stenhouse, who noted that the difference between a teacher-researcher and the large-scale education researcher is like the difference between a farmer with a huge agricultural business to maintain and the "careful gardener" tending a backyard plot:

> In agriculture, the equation of invested input against gross yield is all: it does not matter if individual plants fail to thrive or die so long as the cost of saving them is greater than the cost of losing them . . .This does not apply to the careful gardener whose labor is not costed, but a labor of love. He wants each of his plants to thrive, and he can treat each one individually. Indeed, he can grow a hundred different plants in his garden and differentiate his treatment of each, pruning his roses, but not his sweet peas. Gardening rather than agriculture is the analogy for education. (Rudduck and Hopkins, 1985, p. 26)

This view of the practitioner inquirer as a "careful gardener" is a much more productive image to hold in our minds of PDS teachers, principals and teacher candidates engaging in deliberative investigations of practice. They are not scientists in white lab coats, staring down at their "research subjects" (the students they teach), but "human beings in the midst of teaching, carefully weighing the value of different ways of teaching and learning" (Hubbard & Powers, 1993, pp. 3-4). As a PDS community, we need to continually highlight this difference for others, so that teacher inquiry does not take the form of miniature university research, but rather, serves as a meaningful and productive way to continually learn and grow in one's teaching practice throughout the professional lifetime.

Inquiry as Project Versus Inquiry as Stance

Purpose

As one learns to teach and inquire into teaching within the PDS, a structure must scaffold investigations of practice. Teacher candidates, practicing teachers, and PDS principals are taught the discrete components of the inquiry process defined as follows:

- **Wondering –** a question focused on a problem of practice that emerges from a felt difficulty or real-world dilemma experienced by the practitioner;
- **Data Collection –** capturing the action, learning and thinking that is occurring in the classroom and/or school through such mechanisms as observation, the collection of student work, interview/focus groups, digital pictures, video, reflective journals, weblogs, surveys, and various quantitative measures of student achievement;

- **Data Analysis –** creating a story of one's learning as an inquirer based on a systematic examination of data, and carefully supporting claims made about one's learning with evidences from those data;
- **Sharing –** educators collaborating with one another to define and refine their investigations into practice as well as communicate the results of their work with other professionals; and
- **Action –** making informed change and adjustments to teaching and administrative practice to improve learning conditions within a classroom, a school, and/or an entire district (Dana, 2013).

Cycling through each component of the process, as defined above, throughout one's professional lifetime serves to make investigations of practice deliberative and enables educators to take an inquiry stance towards teaching. The term "inquiry as stance" was first coined by Cochran-Smith and Lytle in the late 1990s when they wrote:

> In everyday language, "stance" is used to describe body postures, particularly with regard to the position of the feet, as in sports or dance, and also to describe political positions, particularly their consistency (or lack thereof) over time. . . In our work, we offer the term inquiry as stance to describe the positions teachers and others who work together in inquiry communities take toward knowledge and its relationships to practice. We use the metaphor of stance to suggest both orientational and positional ideas, to carry allusions to the physical placing of the body as well as to intellectual activities and perspectives over time. In this sense, the metaphor is intended to capture the ways we stand, the ways we see, and the lenses we see through. Teaching is a complex activity that occurs within webs of social, historical, cultural, and political significance. Across the life span, an inquiry stance provides a kind of grounding within the changing cultures of school reform and competing political agendas (Cochran-Smith & Lytle, 1999, pp. 288-289).

Since then, Cochran-Smith & Lytle (2009) have authored an entire book entitled *Inquiry as Stance*, carefully choosing these words for their title to suggest that inquiry is more than the sum of its parts (developing questions, collecting and analyzing data, making one's study public, and taking actions for change based on what was learned through the process). Rather, inquiry is "a worldview and a habit of mind — a way of knowing and being in the world of educational practice that carries across educational contexts and various points in one's professional career and that links individuals to larger groups, and social movements intended to challenge the inequities perpetuated by the educational status quo" (Cochran-Smith & Lytle, 2009, p. vii). This is the essence of inquiry as stance: the cultivation of which is the ultimate goal for participants in the Professional Development School.

Problem

Throughout the years I have spent studying, coaching, doing, and teaching about the process of inquiry, I have found that the structure of inquiry (wondering development, data collection, data analysis, sharing, action) often translates into assignments on course syllabi. While it makes perfect sense to use a college course structure to introduce teacher candidates and practicing educators to the process of inquiry, the problem is that when introduced to the process as a coursework assignment, teacher candidates and school practitioners might initially view inquiry as "one more busy work

assignment those professors at the university are going to force me to do." Inquiry becomes a "big project" that exists not as a part of their teaching, but apart from it. Fortunately, I have seen this sentiment subside once one "lives through" an entire cycle of the process and shares the results of their inquiry with others. The act of making public one's work as a teacher inquirer is an authentic experience where educators discover, through seeing the interest and passion for their research in the eyes of those they present their work to, the capability inquiry has to empower teachers as professionals, and put all teachers in the driver's seat of their own professional learning (Dana, 2015).

Potential

As a PDS community, we are uniquely positioned to work towards the creation of more authentic experiences for engagement in inquiry for new and practicing teachers. As the respective participants in the PDS work to simultaneously renew university and K-12 schooling practice, we need to be sure that we are utilizing university traditions of coursework, assignments, presentations, papers, theses, and grades, to help shape the teacher inquiry experience in productive and credible ways for the real world of the classroom, rather than let university traditions of coursework, assignments, presentations, papers, theses, and grades define the teacher inquiry experience. In this way, the view teacher candidates, teachers, and principals initially formulate about inquiry as project, transforms, over time, to inquiry as stance. In addition, as the respective participants in the PDS work to collaboratively design and refine the clinically-based teacher education program, we can experiment with embedding multiple cycles of inquiry throughout the initial teacher preparation experience (Delane et al., in press). Through engaging teacher candidates in multiple cycles of inquiry over time, rather than one cycle as a culminating experience to a teacher education program, we are more likely to cultivate an inquiry stance in the next generation of the teaching workforce. PDSs can lead the way.

Inquiry as Real Versus Inquiry as Ideal

Purpose

As the next generation of teachers adopt an inquiry stance towards teaching, they become a living example and inspiration for others in the teaching profession that inquiry is less about what one does (a project for a university course) and more about who one is (a teacher who positions him/herself professionally—not as an implementer of a rigid, unchanging teaching routine year after year, but a constant and continuous questioner, explorer, and change agent throughout the professional lifetime). Ideally, engagement in teacher inquiry is about transforming the simple, "connect-the-dots" view of teaching so prevalently held by those who set and implement policy that affect the lives of teachers and students in schools, and replacing it with a worldview of teaching that is deeply intellectual, fundamentally ethical, and raises teachers' voices in the discussion of educational reform. As such, teachers' engagement in inquiry should not simply be valued "as a heuristic for the individual teacher," but rather "play a role in the formation of the knowledge base for teaching" (Cochran-Smith & Lytle, 1993, p. 25).

Problem

Throughout the years I have spent studying, coaching, doing, and teaching about the process of inquiry, I have found that the real world of schools is burdened by policy steeped in a simple "connect-the-dots" view of teaching. Therefore, achieving the ideal of what inquiry can and should mean for an educator is difficult to achieve. To contribute to the knowledge base for teaching, inquiry must "be cumulative and accessible to different people over time for a variety of purposes" (Cochran-Smith & Lytle, 1993, p. 25). This often does not happen when inquiry is conducted by practitioners because the pressures of policies and mandates seem to necessitate focusing one's investigation into practice on whatever the latest innovation being introduced into a district happens to be; the fast, harried pace of life in schools makes the time it takes to capture the inquiries, completed by teachers, and make them accessible to others a challenge.

Potential

As a PDS community, we are uniquely positioned to encourage cumulative inquiry over time and to make inquiry accessible to different people for different purposes in different places by nature of the long-term school-university partnership relationships forged with one another. We draw strength from our shared history, working together overtime to resist the urge to jump from one innovation to the next, staying the course to work on the most persistent and pervasive problems facing schools, while chipping away at them a little bit at a time. Kincheloe (1991) writes:

> The plethora of small changes made by critical teacher researchers around the world in individual classrooms may bring about far more authentic educational reform than the grandiose policies formulated in state or national capitals. (p. 14)

Authentic educational reform is the heart of PDS work. As we use resources afforded within the PDS to document our reform efforts through such venues as PDS inquiry conferences and this special-themed issue of *School-University Partnerships*, we create the opportunity "for the profession to expand its knowledge base by putting research into practice – and practice into research" (Darling-Hammond, 1994, p. 1). A PDS culture supports the construction of knowledge and using that knowledge to continually reform, refine, shape, and reshape the practice of teaching toward a more just and equitable schooling experience for all.

Concluding Thoughts

The framing of my reflections as three unresolved tensions I have been experiencing related to inquiry for twenty-five years might give the impression that engaging in inquiry is a hopeless cause for members of the PDS community. After all, after 25 years, if the tensions between university research and practitioner inquiry; inquiry as project and inquiry as stance; and inquiry as real and inquiry as ideal have yet to be resolved, should PDSs continue to embrace inquiry? Might those who work in PDSs better place their time and energy into other endeavors?

When I ponder my experiences with inquiry in a dichotomous fashion, I must admit that it can appear on the surface that not much has changed in 25 years and lead me to wonder if the integration of inquiry into the PDS is worth the effort it takes. It is easy to lament when I see researchers valuing

university research, but not practitioner inquiry. Similarly, teacher candidates experiencing inquiry as a project, but not as a stance. Moreover, educators critiquing the ways inquiry is shaped by the reality of life in schools when it doesn't match the ideal vision for the practitioner research movement.

However, as I conclude this piece, I want to suggest a different way of interpreting the tensions described: rather than viewing these tensions in a dichotomous "either/or" manner with one polarity equating with something "good" and the other something "bad," we can consider them instead in terms of "both/and," and find the value in each. Educators can embrace *both* university research *and* practitioner inquiry, teacher candidates can experience inquiry as *both* project *and* stance, and the inquiry produced by practitioners can be shaped by *both* the real *and* the ideal. For over time, I have learned that it is in navigating the tensions, rather than resolving them, that learning and growth happens for all members of the PDS community. Living the tensions is the real value of inquiry; it is through living in these tensions that we find our purpose, tackle our problems, and actualize our potential. In the end, this is what PDS work is all about—embracing all the inherent tensions that reside in the complex acts of teaching and learning, and in so doing, becoming the very best educators, we can all be … together!

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Action Research in Professional Development Schools: Does it Make a Difference?

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Abstract: This study focuses on teacher inquiry (including action research and inquiry groups) in the context of professional development schools (PDS). The purpose of this study was to examine the role of teacher inquiry in professional development schools and to compare the experiences of PDS teachers, teacher candidates in PDS sites and non-PDS teachers. Surveys, consisting of both qualitative and quantitative questions, were distributed to 147 respondents, including teachers in professional development schools (PDS) (n=54), teachers in non-PDS sites (n= 56) and PDS preservice teacher candidates (n=37). To further examine the results of this survey, in-depth interviews were conducted with teachers who had experienced teacher inquiry in both PDS sites and non-PDS sites. The results show that PDS teachers and teacher candidates in PDSs experience action research and inquiry groups in similar ways. There were not significant differences in their answers. There were two areas that did yield interesting results for PDS research. PDS teachers experienced more support from their principals as they conducted action research and inquiry groups and non-PDS teachers were more likely to seek promotions and leadership opportunities, both within and outside of their schools.

KEYWORDS: teacher inquiry, professional development schools, PDS, teacher candidates, PDS teachers, action research, inquiry groups, interviews, surveys, career paths, administrative support

NAPDS NINE ESSENTIALS ADDRESSED:

1. A comprehensive mission that is broader in its outreach and scope than the mission of any partner and that furthers the education profession and its responsibility to advance equity within schools and, by potential extension, the broader community;
2. A school–university culture committed to the preparation of future educators that embraces their active engagement in the school community;
3. Ongoing and professional development for all participants guided by need;
4. A shared commitment to innovative and reflective practice by all participants;
5. Engagement in and public sharing of the results of deliberate investigations of practice by respective participants;
7. A structure that allows all participants a forum for ongoing governance, reflection, and collaboration;

Introduction

Teacher inquiry is suggested as one approach to impact student learning in professional development schools. In his writings, Lee Teitel (2001) gives national recognition to the impact of teacher inquiry on student achievement:

> The ultimate goal of any professional development school partnership is enhanced learning for P-12 students. In PDSs, this may be a result of the increased numbers of adults in classrooms, the blending of expertise of school and university participants in the school, classroom teaching teams, and/or other forms of school or classroom restructuring. It may also come about as a direct result of changes related to the improved initial and continuing professional development of educators and inquiry focused on improved student learning. (p. 3)

Others call for teacher inquiry to be an important component of professional development schools. The Holmes Report (1998) states that professional development schools "provide superior opportunities for teachers and administrators to influence the development of their profession, and for university faculty to increase the professional relevance of their work, through collaborative research on the problems of educational practice" (p. 63). Somekh and Zeichner (2009) refer to action research as a university-led reform movement where universities work in partnership with schools to use action research as a strategy for educational reform. In some cases, this action research has been organized by teachers as a teacher-directed form of professional development. In the inaugural edition of the National Association for Professional Development Schools' Journal, *School-University Partnerships*, Zeichner (2007) expounds on the concept of professional development for teachers in a PDS site:

> PDSs provide a new kind of professional development to school staff. Instead of having staff leave their schools to participate in professional development activities, the PDS often integrates professional development into the life of schools. The goal is to embed a culture of inquiry into the school. (p.13)

Boyle-Basie and McIntyre (2008) describe action research as a centerpiece of PDS where "crucial teacher preparation, focused on student learning and grounded in teacher inquiry" (p. 326).

This study focuses on two types of teacher inquiry found in PDS, action research and inquiry groups. For this study, the definition of action research offered by Kemmis and McTaggart (1992; 2000) is used. This definition emphasizes an action research cycle that builds on teacher reflection and offers the opportunity to change, or amend, research questions; an important and often overlooked skill for teacher researchers.

> Action research is a deliberate, solution-oriented investigation that is group or personally owned and conducted. It is characterized by spiraling cycles of problem identification, systematic data collection, reflection analysis, data-driven action taken and finally problem redefinition. (p. 14)

Action research is the most formal type of teacher research. Another, less formal, form of teacher research is inquiry groups. According to Cochran-Smith and Lytle, there are three types of knowledge gained from professional development: knowledge for practice, knowledge in practice, and knowledge gained from developing a professional development session (Yendol-Hoppey & Dana 2009, pp. 55-56). The third type, which is summarized as knowledge of practice, stresses systematic inquiry. "Teachers interested in constructing knowledge of practice receive support as they collaboratively inquire with colleagues about how their own teaching practices might inhibit the

learning that takes place in their schools and classrooms" (Yendol-Hoppey & Dana, 2009, p.56). The inquiry groups in this study are an example of professional development that focuses on knowledge of practice. Inquiry groups offer a more action derived opportunity than study groups, which Dana and Yendol-Silva (2003) name as collegial study groups. Inquiry groups also go far beyond the conversations that teachers engage in during school, grade level, or departmental meetings, and offer more formality than the collaborative and collegial conversations that normally exist in a professional development school.

Inquiry-based work is defined by the International Dictionary of Education as "studies beginning with investigation of particular topics or attempts at solving particular problems" (Page, 1977, p.122). Inquiry groups provide teachers with intellectual discourse and investigation tied to the particulars of teaching practices and new ways for teachers to interact. The subtle softening of the word "research" to "inquiry" often makes a difference in teacher perceptions (Garin & McBride, 2013). Teachers are choosing inquiry groups over action research or study groups as a form of research that embraces and enhances the learning that exists between educators working together for a common goal. Inquiry groups offer the collegiality of study groups with the less complex components of action research.

This study focuses action research and inquiry groups as ways for teachers and teacher candidates to document changes in their teaching and student learning. Furthermore, the study examines the experiences with teacher inquiry in both PDS and non-PDS settings. Action research and inquiry groups are the focus of both a survey administered to PDS teachers, non-PDS teachers, PDS teacher candidates, and the subsequent individual and group interviews.

Objectives

The purpose of this study was to examine the role of action research and inquiry groups and how PDS teachers, non-PDS teachers, and teacher candidates in PDS sites report their experiences. Specifically, this study reports the results of surveys, consisting of both qualitative and quantitative questions, distributed to PDS teachers (n=54), non-PDS teachers (n= 56) and teacher candidates (n=37), as well as follow-up interviews with a principal, teacher and teacher candidate to gather additional insights into the results of this survey and focus groups.

The survey and interviews addressed two forms of teacher inquiry: 1) action research and 2) inquiry groups. The purpose of this study was to learn more about the role that both forms of teacher inquiry play in the professional development of teachers and teacher candidates. Additionally, by distributing the survey to both PDS and non-PDS teachers, this study was able to examine how PDS partners view their participation in teacher inquiry as part of their PDS partnership. Also of interest was what role the structure of PDS played in the process and outcome of teacher inquiry. The study also examined the responses by teacher candidates and their reactions to participating in two forms of teacher inquiry during their extensive teaching internship. This study was designed to answer the following questions:

- What do PDS teachers and teacher candidates say about their participation in action research and inquiry groups?
- How do the three groups (PDS teachers, non-PDS teachers, and teacher candidates) experience action research and inquiry groups?

Methodology

This is a mixed methods study as described by Johnson, Onwuegbuzie, and Turner (2007) as a "type of research in which a researcher or team of researchers combines elements of qualitative and quantitative research approaches (e.g., use of qualitative and quantitative viewpoints, data collection, analysis, inference techniques) for the purpose of breadth and depth of understanding and corroboration" (p. 123). Several characteristics of mixed methods research (MMR) are important to this study. According to Teddie and Tashakkori (2011) MMR encourages methodological eclecticism, the freedom to choose what the researcher believes to be the best tools for answering their questions while confirming and exploring questions through diverse range of lenses. MMR also offers a cyclical approach to research and includes both deductive and inductive logic in the same study. In MMR studies, both qualitative and quantitative findings are incorporated toward broader understandings of the data.

Data Collection

Surveys. A survey was developed, piloted and distributed to teachers (PDS and non-PDS) and PDS teacher candidates (see Appendix A for data collection instruments). For Part One of the survey, respondents provided their demographic information such as level of school, years teaching, years involved in teacher research, and focus of research. For Part Two of the survey, respondents provided their perspectives and attitudes on a list of 20 questions using three approaches. Six of the questions used a 5-point Likert Scale. In two questions, respondents ranked items from most important to least important. For the remaining questions, respondents placed a check next to each statement that they had observed or experienced. In order to obtain qualitative data, respondents answered 15 questions (i.e., "Please explain your answer.") to provide additional information.

The survey was pretested with a small sampling of teachers both in PDS and in non- PDS schools. The pretest form of the survey provided space for the respondents to make comments about the specific questions as well as the survey itself. The survey was also pretested with a small sampling of teacher candidates using the same process.

Interviews. Because a more thorough understanding of the experiences of PDS and non-PDS teachers was desired, the quantitative survey results and the analysis of the qualitative survey data were used to create protocols for a Three-Step interview series as proposed by Seidman (2013). Each interview was recorded and transcribed. After the transcriptions were analyzed findings were presented to a focus group to bring more clarity to the results.

Seidman (2013) proposes a *Three-Step Interview Series* for in-depth phenomenological interviewing (pp. 20-23). The first interview, focused life history, requires that the interviewer put the participant's teaching experience in context by asking as much as possible about the topic. For the first interview, questions focused on the experience of conducting action research and participating in inquiry groups in both PDS and non-PDS settings. The second interview in Seidman's (2013) *Three-Step Interview Series* calls for probing for the details of the experience (p. 21). The transcripts from the first interview were used to probe for more information. The goal of this second interview was to learn more about the areas of teacher promotion and principal support for teacher inquiry. The third interview in this series used a more in-depth reflection on the meaning of participant

experiences. The third interview was conducted as a group interview/focus group to bring more clarity to the results. During this group interview, we focused on the themes that emerged during the analysis of interview transcripts and
open-ended survey responses.

Setting. The participating PDS sites, in this study, had several opportunities offered by the university to participate in teacher inquiry. The first teacher inquiry opportunity was for mentor teachers and teacher candidates. Mentor teachers and teacher candidates participated in inquiry groups for which they chose a book to frame their examination of research and instructional practices in their classrooms. The second opportunity, action research, was also for mentor teachers and teacher candidates. During their extensive teaching internship, each teacher candidate conducts action research, based on the classroom and student learning objectives of their respective mentor teacher. While the primary responsibility for this action research is on the teacher candidate, mentor teachers assist with the creation of the topic, research question, and data collection. The third opportunity is in the form of action research mini-grants. Each PDS site had the opportunity to apply for an action research mini-grant, offered through the university, which funded the materials needed to conduct the study. The recipients of these mini-grants were asked to involve the teacher candidates in their study.

The non-PDS teachers also had opportunities to participate in action research and inquiry groups offered through the local school district. One opportunity included inquiry groups where two teachers from a school would meet with pairs from other schools. These groups focused on challenges of working with English Language Learners (ELLs), or students who were identified as struggling readers. The other opportunity the school district offered was action research grants to groups of teachers from one school. These grants were competitive in nature and had to focus on strategies for increasing student learning on both school-based assessments and state assessments.

Participants. Purposeful sampling, as evidenced from Bogdan and Biklen (2007), was used to identify the interviewees. Three educators were selected to interview for this study. All three of these educators had the experience of conducting teacher inquiry in both a PDS site and a non-PDS site. These teachers were not chosen randomly, but rather were chosen because they had participated in action research or inquiry groups both within the PDS context and in non-PDS schools. "You chose particular subjects to include because they are believed to facilitate the expansion of the developing theory" (Bogdan & Biklen, 2007, p. 73).

Jenny (pseudonym) participated in both PDS and non-PDS action research and inquiry groups. She recently retired from a PDS site where she was an ELL teacher and served as the site-based PDS Coordinator who facilitated the inquiry groups for mentor teachers and teacher candidates. Jenny was also the recipient of several of the PDS mini-grants awarded by the university. Prior to her coming to this PDS site, Jenny was an ELL teacher in a non-PDS site, and prior to that, a reading specialist in a non-PDS site where she participated in the school district sponsored inquiry groups.

Rose (pseudonym) is currently a 5th grade teacher at a PDS site, her third PDS site in our PDS Network. She is an adjunct faculty member and teaches the science methods course to early childhood/special education and elementary education majors. Rose is also one of the facilitators for the PDS Network's mentoring courses. Rose was a former teacher candidate who was hired at the school where she did her extensive teaching internship. Rose transferred to another PDS site where she served as the site-based PDS coordinator. Rose participated in inquiry groups as a teacher

candidate, mentor teacher and site-based PDS Coordinator. As a mentor teacher and site-based PDS coordinator she has mentored teacher candidates through their action research.

Mike (pseudonym) is the principal of an elementary PDS site where, each year, several inquiry groups are formed based on teacher and teacher candidate interests. Prior to becoming a PDS principal, Mike was a high school mathematics teacher. During that time, Mike was the recipient of a school district action research grant for non-PDS schools.

Data Analysis

For the quantitative items in the survey, descriptive statistics were used to see how the three groups responded. The mean differences between PDS teachers, non-PDS teachers, and teacher candidates were examined. Percentage trends, by group, are presented when there were no statistical differences.

The qualitative survey responses and interview transcripts were analyzed using coding categories, or themes, described by Bogdan and Biklen (2007) as "terms and phrases developed to be used to sort and analyze qualitative data" (p. 271). The interview transcripts and qualitative survey responses were read and reread, and recurring statements were marked and emerging regularities and patterns, topics, chunks, and classifications were identified. These categories were then used to create codes about the experiences of teachers and teacher candidates as they participated in action research and inquiry groups. Member checking occurred during the focus groups. Additionally, themes from the qualitative data sources were triangulated with the survey data and interview data.

Findings

The data obtained from this survey offered rich information about the role of teacher inquiry in our professional development schools and university classes. The first research question posed was: *What do PDS teachers and PDS teacher candidates say about their participation in action research and inquiry groups?*

PDS teachers and PDS teacher candidates had much to say about their participation in both of these forms of teacher inquiry. The results of the survey indicated that PDS teachers and teacher candidates experienced action research and inquiry groups in similar ways. There were no significant differences in their answers and in most cases, the selection of their answers on Likert scale questions was the same. When asked to identify the top two items that facilitated action research, both PDS teachers and teacher candidates identified in the same order: *time to conduct action research and knowing how to conduct action research.* When asked to identify the biggest hindrances, both PDS teachers and teacher candidates selected first *time to conduct action research* and second *knowing how to conduct action research*. In addition, PDS teachers and teacher candidates expressed similar views on action research and inquiry groups. Both groups identified them as being similar experiences. One of the teacher candidates commented, "Inquiry groups are just an informal approach to using an array of strategies and the action research is the implementation of the strategies." This supported the open-ended question responses where PDS teachers commented that often the inquiry group readings and discussions led seamlessly into the teacher candidate's action research. The

second research question posed was: *How do PDS teachers and non-PDS teachers experience action research and inquiry groups?*

Differences between these two groups of teachers began to emerge in the examination of the second research question. While PDS teachers identified *time to conduct my research* and *knowing how to conduct my research* as being the top two essential components, non-PDS teachers identified *time to conduct my research* and *being able to select my own research questions* as being essential. The difference between the experiences of PDS and non-PDS teachers continued to emerge as PDS teachers felt that what hindered the teacher inquiry process was *time to conduct the research* and *knowing how to conduct the research*. Non-PDS teachers identified *time to conduct the research* and *administrative support* as being the top hindrances in the teacher inquiry process. The theme of administrative support emerged in other areas of the survey and will be discussed later in this section.

One question on the survey that yielded statistical significance was, *"What influences has teacher inquiry had on your students' learning, attitudes and performance?"* Respondents were given six choices to check, as outlined, below.

The number of checked choices was summed for each respondent, then averaged for each group (i.e., non-PDS and PDS). The six choices that could be checked were:

- Student attendance has improved in my classroom;
- Students are receiving higher grades on their report cards;
- Teacher made test scores are higher;
- Students reading levels have increased;
- Student interest and/or motivation has improved; and
- Student achievement on state or national tests has improved.

Non-PDS teachers checked, on average, more options than PDS (Mean = 1.96 for non-PDS and 1.39 for PDS). This difference was statistically significant at the $p<.05$ level $t=2.9$; $df=108$. While both groups reported increases in student learning, non-PDS teachers were more likely to identify changes in state and national tests scores. To further understand this survey data, interview analysis led to the discovery that the school system funded action research grants were designed to impact state test scores and those scores were one of the required data sources. For example, Mike reflected on his experience as a math teacher conducting action research through his school district: "Our action research took place at the time we were getting into the whole Maryland State Assessments and the High School Assessments, so our action research focused on *How do kids really respond to open-ended questions across content areas?"*

There were two areas on the survey that yielded interesting results for PDS research. These areas were teacher career paths and principal support. The answers to the survey question, *How has teacher inquiry influenced your career path?* were explored further in the qualitative survey answers and in the individual and group interviews. The data suggests that non-PDS teachers are more likely to seek new leadership roles and promotions both within and outside of their schools.

Table 1. Survey Response Percentages of Question 7

Question 7: How has teacher inquiry influenced your career path?	**PDS (Yes)**	**Non-PDS (Yes)**
Question Items		
1. I have taken on new leadership roles such as grade level chair, department chair, SIT member, etc.	13%	57%
2. I include my research in job interview and/or portfolios and/or my exit portfolio.	22.2%	55.4%
3. I have been promoted.	0%	1.8%

As shown in Table 1, 13% (i.e., 7 respondents) of the 54 PDS respondents indicated that they have taken on new leadership roles. In contrast, 57% (i.e., 32) of the 56 non-PDS respondents said that they have taken on new leadership roles. That is the non-PDS respondents are nearly four and half times more likely than PDS respondents to take on new leadership roles.

This survey question was followed by the open-ended prompt, "I have been promoted to____." Of the 54 PDS teachers who responded to this survey, only three completed this question.

Their responses included inquiry group leader, grade level chair and site-based PDS coordinator, which is consistent with Table 1. The non-PDS teacher responses included eleven teachers who were promoted to grade level chair, one teacher promoted to the position of Supervisor of Reading and eight other teachers responded with a variety of positions within their schools.

The interview discussions around the topic of promotion yielded three themes: 1) surprise at what this data revealed; 2) PDS as a leadership opportunity; and 3) questioning why teachers would leave the classroom (see Appendix B for themes for promotion). Mike, Jenny and Rose seemed surprised by these results. Jenny's response, "That is interesting. I had no idea" was similar to Rose's response to the data, "That is interesting. I wouldn't have thought that." The principal's reaction was, "I am surprised but wonder if the PDS teachers are basically in a leadership role and I wonder if they are interpreting that as I am given the opportunity to show my leadership and my administrative skills and at the same time I am a 10-month teacher."

Further exploration of the area of teacher inquiry and career path in both individual and group interviews was conducted. In further discussion, Jenny felt that PDS teachers probably didn't seek promotion because, "Teachers who are choosing to be involved in PDS probably mostly love teaching. If you want to work with a teacher candidate, I think most mentor teachers truly do…. They are doing what they enjoy best already." Rose thought about her own experiences as she confronted the dilemma of teacher promotion:

> So, my initial thought is that being in the PDS allows us to have different leadership roles so we are already fulfilling that natural innate teacher desire to be a leader. I think that from early on in my career because I was a part of PDS I was able to have some leadership roles and that for me personally I don't think teaching is a position I took because I wanted upward mobility." "I think that everyone who truly becomes a part of PDS and embraces it wants to

> stay with it. The teachers that I know who truly have taken on teacher candidates and really adopted being a part of the university and have completed the mentoring workshops – I think those who really take ownership of it feel connected to the university and the whole idea of PDS and don't want to lose it.

On some level, the teachers saw seeking promotion for teachers as not always being a positive thing. Jenny commented, "Sometimes people who were seeking promotion are just trying to get out of the classroom. They are not necessarily bad teachers, but they are not interested in the students and I feel like teachers who really love the children, and they love what they are doing, are more likely to want an intern and that is the satisfaction that they want."

During the group interview, participants revisited the idea of career path, and Jenny and Rose both wondered if PDS teachers were already in leadership roles in their schools. Jenny reminded the group that to become a mentor teacher there is a screening that occurs at the PDS site: "Principals tend to pick stronger teachers who may already have a leadership role in the school." Rose reiterated that many teachers do not seek promotion outside of the classroom:

> "I came to teaching to educate children. I still go back to the time when everything in the classroom clicks and it is just you and the kids and learning is happening and that is why I do what I do, not for promotion. I feel promoted when my test scores improve or when students come back to me and say, 'You know I am getting all A's in middle school math, and it is because you helped me figure out fractions.'"

The second area on the survey that also yielded interesting results for PDS research was the question of principal support for teacher inquiry. Survey responses to the question, *What level of support do you receive from your principal (mentor teacher for teacher candidates) for your teacher inquiry?* are included in Table 2.

As shown in Table 2, 85% of the PDS respondents said that their principal was either *very supportive* or *supportive*. In contrast only 74.6% and 72.2% of the Non-PDS and Teacher candidate respondents (respectively) said that their principal was either *very supportive* or *supportive*. On the low end of support, 5% of PDS teachers said that they received *little or no support*. In contrast 9.1% and 11.1% of Non-PDS teachers and Teacher Candidates (respectively) said that they received *little or no support*.

This survey question about administrative support was followed by the open-ended prompt, "List some of the supportive or non-supportive actions that your principal has demonstrated." Of the 54 PDS respondents, there were 31 individual descriptions of types of support PDS teachers received from their principals. Of the 31 supportive behaviors described, 10 comments were made about the principal attending some of their meetings. Other areas of support included purchasing materials/professional books, providing time and space for meetings, and providing recognition and encouragement. Only one respondent indicated that the principal, "never approached me about the progress of my professional growth during my participation."

Table 2. Survey Response Percentages of Question 10

Question 10: What level of support do you receive from your principal (mentor teacher) for your teacher inquiry?	**PDS**	**Non-PDS**	**Teacher Candidate**
Ratings			
Very Supportive	60%	58.2%	58.3%
Supportive	25%	16.4%	13.9%
Somewhat Supportive	10%	16.4%	16.7%
Little Support	0%	7.3%	8.3%
No Support	5%	1.8%	2.8%

Note. The responses were rated on a scale of 0-4. The average level of PDS support was 3.35 (0 to 4 scale), and the average level of support for Non-PDS teachers was lower at 3.22. Teacher candidates had the lowest average at 3.17.

The supportive and non-supportive comments made by teacher candidates closely mirrored those of the PDS teachers. For teacher candidates, the survey focused on the support they received from their mentor teachers. Of the 37 teacher candidates, only two asked for more time for their research and more support from their mentor teachers. Teacher candidates identified the following mentor teacher behaviors as being supportive of their action research: assistance with materials, providing time for research, offering suggestions and ideas, and allowing the teacher candidates to implement the strategies they identified in their research.

The non-PDS teachers also described principal support in similar terms such as providing acknowledgement and encouragement. This was identified by nine of the respondents. Five respondents mentioned that the principal purchased materials. The non-PDS teachers expressed more examples of non-supportive actions by their principals. These areas included non-attendance at meetings, cancelling meetings, complaints about the frequency of meetings and lack of or a superficial interest in the teacher inquiry.

The interview discussions with Mike, Jenny and Rose around the topic of principal support yielded three themes: 1) a description of PDS principal support for teacher inquiry; 2) non-PDS principal support for teacher inquiry; and 3) a description of the kind of support PDS teachers would like to receive (see Appendix B for summary of themes for principal support). Jenny described high levels of support from her PDS principal including principal praise for what the teachers were doing, principal participation in the school's inquiry group, and principal sharing with the larger faculty short video clips of what teachers were doing in their classes relative to the strategies being discussed in inquiry group meetings. This PDS principal also provided opportunities for the teachers to share their inquiry work at faculty meetings. Jenny remarked that as a result of these, teachers would follow up with questions (i.e., "Now how did you do this kind of thing?"). Jenny felt that PDS principal support not only promoted teacher inquiry opportunities, but also helped people see these opportunities as contributing to the quality of teaching at the whole school.

Jenny described the support from the non-PDS Principal as being more tacit in nature. "I certainly offered to share and show her what we were doing and the response was more kind of 'Oh

that's nice'." The principal did support the teachers attending school district meetings by securing substitute coverage for classes, while the funding came from the school district.

Rose also described principal praise in her interview. For her, principal support for teacher inquiry often sounded like principals praising the teachers or letting teachers know that their work in inquiry group and action research was appreciated. Rose also commented that one of her principals is currently in her inquiry group.

Mike's perspective on principal support came from his experiences as a teacher and as a current PDS principal. Mike described non-PDS principal support as strong, in contrast to Jenny's experience. He felt the support because one of the principal's administrators served on their research team that focused on state mandated testing required for graduation from high school. Using school district funding, teachers were able to meet during the school day on occasions to discuss their research. As a current PDS principal, Mike reflected on what principal support for teacher inquiry would look like and was honest that he wanted to make some changes:

> "You know once the action research is over with and it just sits on a shelf if the principal doesn't bring it to anyone's attention or insist that this be incorporated. If this isn't beneficial then what instructional strategy would be beneficial?"

Mike spoke enthusiastically about giving teachers the opportunity to figure out their own topic as a form of PDS principal support for teacher inquiry. "I also tell teachers don't be afraid to fail, you have your hypothesis of what you think the outcomes should be but if that outcome isn't there it is okay because that is beneficial knowledge right there." Mike asserted that PDS sites would benefit greatly if the inquiry group, teacher candidates' action research and action research mini-grant research agendas and findings would be shared with the entire school; he seemed to formulate some plans for doing so.

During the group interview after reviewing the data, Jenny commented, "The descriptions are very telling. It makes it clear how important principal support is and in a PDS that principal support is a given. You would not be a PDS unless you bought into the support for teacher inquiry. Focus group members felt that principals should value teacher inquiry and show an interest in the results and the impact on teaching and learning.

Discussion

This study focused on teacher inquiry (action research and inquiry groups) in a PDS context to examine the role of teacher inquiry in PDS and to compare the experiences of PDS teachers, teacher candidates and non-PDS teachers. Hence, did action research make a difference to PDS teachers and teacher candidates?

This study yielded two findings that are significant to teachers and teacher candidates conducting action research in their PDS sites. These findings included principal support and teacher career paths.

Principal Support

The first finding is that non-PDS teachers identified lack of principal support for their action research, both as a challenge and hindrance to their action research experience. In contrast, PDS teachers did not experience a lack of administrative support.

The findings indicated that principal support was imperative in fostering teacher inquiry in PDS. The question of why PDS teachers report a greater sense of principal support can also be explained by the nature of PDS and the role of teacher inquiry as an important and necessary component of the PDS structure. For example, the structures provided by the Maryland State Department of Education insure that teacher inquiry be a vital aspect of PDS partnerships in the state. The Maryland State Department of Education ([MSDE], 2012) created PDS State Standard included in a PDS Implementation Manual. Within these five PDS Standards, there is a component for teacher inquiry. MSDE (2012) defines an inquiry group as "a group of PDS stakeholders who collaboratively examine and assess their practices and the outcomes achieved," and who "raise specific questions related to teaching and learning, seek to systematically answer these questions, use their findings to inform practice, and relate their findings to others" (p. 20). MSDE (2012) expands the scope of this type of research by recommending that inquiry groups "might include teachers, university faculty, teacher candidates, and may be designed to affect practice in the classroom, in school-wide or system programs, and in teacher preparation programs" (p. 20).

The findings in this study for principal support for PDS teacher inquiry are similar to those of other studies. Tillford (2010), in a phenomenological study that explored principal leadership, identifies five assertions that characterize how principals make sense of their PDS roles. One of those assertions is, "When PDSs engage in inquiry into student learning, inquiry serves as a 'tipping point' that increases principal commitment to the partnership" (p. 70). Foster, Loving, and Shulman (2000) identified core characteristics of effective PDS principals as supportive of collaboration and teacher advocates. Bier, Foster, Bellamy and Clark (2008) discussed the role of PDS principals as supporting inquiry to improve practice and having a partnership focused on student learning.

Career Path

This study yielded a second finding of interest to PDS research in the question of teachers' career paths. PDS teachers are less likely to seek new leadership role and promotion both within and outside of their schools. Non-PDS respondents were nearly four and a half times more likely than PDS respondents to take on new leadership roles. The results of this study indicate that PDS teachers experience teacher leadership roles as part of their PDS partnership including participation in their own action research, mentoring their teacher candidates through their action research, as well as participating in inquiry groups with other mentor teachers and teacher candidates. They reported that they remain in the classroom because these PDS opportunities provide the leadership experiences that they seek.

These findings are also consistent with the literature on teacher leadership. According to Danielson (2007) teacher leaders serve in two fundamental types of roles: formal and informal. Formal roles include department chair, master teacher or instructional coach all of which include a selection process. PDS teachers who serve as mentor teachers go through a selection process within

their school and often participate in mentoring workshops. These teacher leaders engage in action research and often lead teacher inquiry groups. Other more informal roles emerge as teachers interact with peers in a more grass roots manner. According to Harrison and Killion (2007), these teacher leaders "shape the culture of their schools, improve student learning, and influence practice among their peers" (p. 45).

Barry, Daughtrey, and Wieder (2010) maintain that "increased leadership opportunities for teachers lead to more control over the policies in their schools and greater degrees of autonomy in their jobs and these teachers are more likely to remain in teaching and feel invested in their careers and their schools" (p.1). Barry et al. (2010) report, "Teachers have few opportunities to lead and influence both policy and programs. In fact, teaching is a traditionally flat profession with few opportunities for teachers to advance professionally without leaving the classroom" (p.1). The PDS structure provides teachers with many teacher leadership opportunities including mentoring, facilitating mentoring workshops, meeting with other PDS teachers within a PDS network, serving as adjunct faculty, attending and presenting at PDS conferences, and co-authoring articles with university faculty (Garin, 2015; Garin et al., 2015).

This study adds to the literature by addressing the participation of teachers in teacher inquiry and its importance to the professional development of PDS partners. While many books and articles address how to conduct action research (Mills, 2003; Reason & Bradbury, 2008; Stringer, 2007;), little has been written from the viewpoint of those participating in action research. In addition, this study compares PDS and non-PDS participant experiences in teacher inquiry, gives voice to PDS teachers and teacher candidates as they participate in action research and inquiry groups in their PDS sites, and explains how teacher inquiry in PDS makes a difference.

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Appendix A: Data Collection Instruments

Survey Questions

1. What facilitates the process of action research for you? Rank the top three items in order of importance with 1 being the most important and 3 being the least important.
    a. Time to conduct my research
    b. Administrative support
    c. Selecting my own research question
    d. Conducting research with others
    e. Know how to conduct research
    f. Participating in data collection
    g. Materials inducing professional texts on action research
    h. Knowing that I can implement the outcomes of my inquiry
2. What hinders the process of teacher research for you? Rank the top three items in order of importance with 1 being the most hindering and 3 being the least hindering.
    a. Time to conduct my research
    b. Administrative support
    c. Finding a good research question
    d. Conducting research with others
    e. Knowing how to conduct research
    f. Participating in data collection
    g. Materials inducing professional texts on action research
    h. Knowing that I can implement the outcomes of my inquiry
3. What influences has teacher inquiry had on your teaching? Check those items that apply to you. Please explain your answers.
    a. I leaned new teaching strategies
    b. I am more willing to try new teaching approaches
    c. I use reflection to make instructional decisions
    d. I feel more able to justify instructional decisions
    e. I enjoy teaching more than I did before I participated in teacher inquiry
    f. Explain_____
4. What influences has your inquiry had on your students' learning, attitudes and performance? Check those items that apply to you and explain your answer.
    a. Student attendance has improved in my classes
    b. Students are receiving higher grades on their report cards.
    c. Teacher made test scores are higher
    d. Student reading levels have increased
    e. Student interest and/or motivation has improved
    f. Student achievement on state or national tests has improved
5. How has teacher inquiry influenced your career path? Place a check beside those items that apply to you?
    a. I have taken on new leadership roles such as grade level chair, department chair, etc. Please Specify_____

   b. I have made presentations at conferences
   c. I include research in job interview and/or portfolios
   d. I have received an award or recognition
   e. I have been promoted to _____
   f. I have written an article for a journal or newspaper
6. What level of support do you receive from your principal for your teacher inquiry? Check the best answer.
   a. very supportive
   b. supportive
   c. somewhat supportive
   d. little support
   e. no support
7. Describe some of the supportive or non-supportive actions that your principal has demonstrated.

Sample Tier One Interview Questions:

1. What was it like to do action research or be in an inquiry group as a teacher candidate?
2. What was it like to be a teacher candidate in an inquiry group? What do you observe about intern participation in inquiry groups now that you are a mentor teacher?
3. What is it like being on the other end of mentoring the action research process for teacher candidates?
4. Talk about the role of principal support in inquiry groups and action research.
5. How would you describe PDS principal support for teacher inquiry?
6. Describe your experience participating in teacher inquiry in a non-PDS setting.

Sample Tier Two Interview Questions:

1. I went through the transcript and one of the comments that you made is *this is the first time I saw teachers learning from each other and learning from interns.* Can you tell me more about what you saw in teachers learning from each other and learning from the interns?
2. Tell me more about how it works when the principal routinely comes into the inquiry group or just drops in. How do teachers feel about that?
3. You talked about praise, principal praising the work that you do in teacher inquiry. What would that praise look like?
4. What does promotion look like to you? Throughout the interview you mentioned the term moves on.
5. What would the behaviors look like in a principal who was supportive of teacher inquiry?

Sample Tier Three: Group Interview

The purpose of this focus group is to gather feedback on the survey results and the themes identified in the interview transcripts.
Getting Started: Introductions, purpose of the focus group
Shared Ground Rules: Each participant will have the opportunity to speak. Each person's viewpoints may differ from others in the group. We will listen intently to one another's viewpoints and feel comfortable developing ideas viewpoints based on what we hear

Question 1: What are the first three words that come to mind when you think about principal support for teacher inquiry?
Question 2: What is your overall perception of the survey results about what supports and hinders the action research process?
Question 3: After seeing a chart that summarizes PDS and non-PDS teachers career paths, what are your reactions to the numbers? What is your reaction to the themes identified?
Question 4: After seeing a chart that summarized PDS and non-PDS teachers' perceptions of administrative support for teacher inquiry, what are your reactions to the numbers? What is your reaction to the themes identified?

Appendix B: Themes for Teacher Career Paths and Principal Support

There were three informants and each was interviewed twice individually and then the three informants met in a focus group. Interviews were recorded and transcribed. Themes were identified for the interviews. Themes were also identified for the open-ended qualitative data survey results.

	PDS Teachers 54 respondents	**Non-PDS Teachers 56 respondents**
I. Career Paths		
Themes Identified: **-Surprise at what the data revealed** **-PDS provides a leadership opportunity** **-Why would teachers leave the classroom?**	-13% (7 teachers) have taken on new leadership roles -Only 3 teachers identified areas of promotion (inquiry group leader, grade level chair, site-based PDS Coordinator) -13% (7 teachers) have taken on new leadership roles	-57% (32 teachers) have taken on new leadership roles -11 teachers promoted to grade level chair, 1 promoted to Supervisor of Reading, 8 others with variety of positions within their school
II. Principal Support for Teacher Inquiry **Themes identified:** **-Description of PDS Principal Support** **-Description of Non-PDS Principal Support** **-Description of type of support PDS teachers would like to receive**	-31 examples of supportive principal behaviors identified -10 principals attended meetings -21 other areas such as purchasing materials, providing time and space, and providing recognition mentioned -1 teacher responded s/he did not receive principal support	-9 examples of supportive principal behaviors identified -4 allowed to attend meetings -5 purchased materials - Principal non-support for teacher inquiry described as non-attendance at meetings, cancelling meetings, complaining about frequency of meetings, and lack of or superficial interest in the teacher inquiry

Developing an Inquiry Stance Through PDS Action Research: Does it Maintain After Graduation?

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Abstract: Action research is a common component of teacher education programs. Because of its focus on intentional, reflective, and systematic investigation into one's own practice, colleges and universities have commonly made action research a capstone endeavor of their programs. Engagement in deliberate investigations of practice is a hallmark of Professional Development Schools. But surprisingly there is little research investigating the influence of action research after graduation, particularly on graduates' inquiry stances. In this study, we investigated how candidates perceived the influence of action research in their teaching prior to and one year after graduation. The study occurred in our first year of implementing action research with our candidates. Our findings indicated that action research affected how candidates viewed their teaching as well as enhanced their readiness for data. One year later, they were, in fact, enacting an inquiry stance in their teaching. In this article, researchers share further questions raised by the data and current programmatic changes.

KEYWORDS: action research, inquiry, professional development schools, PDS

NAPDS ESSENTIALS ADDRESSED:

4. A shared commitment to innovative and reflective practice by all participants;
5. Engagement in and public sharing of the results of deliberate investigations of practice by respective participants

Introduction

Action research is a common component of teacher education programs. Because of its focus on intentional, reflective, and systematic investigation into one's own practice, colleges and universities have commonly made action research a capstone endeavor of their programs (Lattimer,

2012). In 2010, the National Council for the Accreditation of Teacher Education (NCATE) Blue Ribbon Panel standards cited action research, and particularly the development of an inquiry stance, as integral to helping candidates identify and address the needs of their students. Additionally, the National Association for Professional Development Schools (NAPDS) named "engagement in and public sharing of the results of deliberate investigations of practice" as one of the nine essentials of being a professional development school (2008, p. 6). Analysis regarding the impact of action research on future teachers is positive in relation to candidate development of skills such as reflection, use of data, risk-taking, and linking of theory to practice (Levin & Rock, 2003; Price, 2001; Ulvik & Riese, 2016)

But what happens after student teachers graduate? Does the impact of inquiry follow them into their first years? Much of the current research focuses on the outcomes of action research on preservice teachers prior to graduation. However, the impact of first year socialization on new teachers is well documented (Farrell, 2003). Contextual factors within the first year of teaching work to enhance or dampen what was learned during preservice teacher preparation. Thus, it cannot be assumed that educators will continue with an inquiry based approach, even one that derives from a framework as supportive and partnership-oriented as a Professional Development School (PDS) program. Considering the circumstance, we examined our graduates immediately after conducting action research during their full-time student teaching internship and one year later after they began teaching. We asked: How do candidates view the role of action research in their teaching during their internship and first year of teaching? To what degree do graduates maintain and express an inquiry stance during their first year of teaching?

Theoretical Framework

A goal of our PDS teacher education program is to use action research as a vehicle toward developing an inquiry stance. As such, two lines of literature frame our work: *inquiry as stance* and *action research.*

Inquiry as Stance

Inquiry as stance is a concept that has been adopted in preservice literature and programs. But what does it really mean? According to Cochran-Smith and Lytle (2009), who coined the term, "the work of inquiry in and on practice involves making problematic current arrangements of practice, the ways knowledge is constructed, evaluated, and used in various educational settings, and the roles practitioners play in facilitating change in their own work contexts" (p. 14). In short, holding a stance of inquiry means that everything in one's practice is subject to questioning. "Best practices" are not accepted without examination and teachers recognize their potential agency in affecting the context of teaching and learning. Holding a stance of inquiry also means that teachers acknowledge and reject the traditional role of teachers as knowledge consumers, relying on others to inform them of "best practices" (Borg, 2010; Goodson & Hargreaves, 1996). Instead, teachers holding an inquiry stance adopt a role of knowledge generators, pushing themselves to question and evaluate that which might be assumed. It is because of, and through, such reflection that teachers launch investigations into

teaching and learning, actively creating their own knowledge rather than passively consuming it (Cochran-Smith & Lytle, 2009).

According to Ravitch (2014), holding inquiry as stance involves three elements: (1) developing and refining understanding of reflection and its role, (2) viewing inquiry as an everyday ethic, and (3) viewing inquiry as central to our professional vision. It is "being committed to our own processes of self-reflection and the continual investigation into, and systematic, data-based critique of, our practices and the contexts – both macro and micro – that shape them" (p. 7). Ravitch (2014) asserts that inquiry as stance allows teachers to push back against narratives that have marginalized particular groups. We assert that teachers are one of these groups, and holding an inquiry stance enables them to redefine their agency in this effort (Price & Valli, 2005).

Action Research

As we consider both how to develop an inquiry stance and how to operationalize one's inquiry stance, we turn to action research. Action research is "a process of systematic inquiry, usually cyclical, conducted by those inside a community…[I]ts goal is to identify action that will generate improvement the researcher believes important" (Hinchey, 2008, p. 4). Action research positions teachers as researchers, turning the ideas of teacher as technician (Gray, 2007) on their heads. *Teachers as researchers* seek to surface and problematize taken-for-granted assumptions that underlie work in schools. Reflection is intentional and inward (Dana & Yendol-Hoppey, 2014). There are many models of action research, but all follow a similar flow. Typically, it all begins with a question. A question that a teacher or group of teachers are interested in that will somehow better student learning and expand their pedagogical knowledge. The teacher, then, seeks out more information about that question by consulting with professional practitioner resources, and ideally, academic research. Using what they learn, they tweak their question into something researchable and design an action plan to address the question. The plan includes the collection of data to monitor the action's outcomes. The data are analyzed, the teacher reflects on the findings, and they determine the next steps or the next question that has now been raised (Dana & Yendol-Hoppey, 2014; Mills, 2013; National School Reform Faculty, n.d). The action research process is often depicted as a sequence, but in reality, this process mimics the life of a classroom. Teachers navigate through and between steps in a nonlinear fashion (Dodman et al., 2013). Action research assumes a sociocultural and situated view of learning whereby the researcher and their findings cannot be separated from their context.

Action research has a long history in education, stemming from Dewey's (1933) work in reflective practice. The actual term originated from Lewin (1946), as he studied increasing democratic participation for underrepresented groups. However, in 1954, Corey characterized action research in education as "no more than attempting to solve practical school problems by using research methods" (p. 379). Since that time, research on action research has found it to be a productive means of professional development that enhances reflective capacity (Zeichner & Noffke, 2001) and collective knowledge when conducted with a group of peers (Hagevik, Aydeniz, & Rowell, 2012). The process is also seen as one that can be liberating for teachers in the context of increased accountability demands and narrowed teaching (Hutchinson, 1996).

While action research has been promoted as a tool for reflection and professional development and is a common element in teacher preparation programs, its challenges and limitations in preservice programs have been documented. For example, the context of a preservice teacher is one of limited agency by default. Preservice teachers are not employed by the school in which they work and their classroom is not their own. While they must independently plan and teach for a required length of time during their placement, they are bound by layers of power that in many ways dictate what and how they will teach (Anderson & Stillman, 2013). In a traditional teacher preparation structure, where the school and university are often more acquaintances than partners in teacher preparation, these power dynamics can be magnified as candidates engage in a predictable routine of learning to teach—first they observe, then they teach discrete assignment-driven lessons in classrooms, and ultimately in a final semester of their program they perform instruction meant to mirror that which they have observed or learned about in university courses (Castle & Reilly, 2011; Montecinos et al., 2011).

Knowledge is considered to be held by mentor teachers and theory, not constructed by the candidates (Perry & Power, 2004). Although the professional development school structure is meant to flatten some of these hierarchical barriers to candidate learning (Castle, Fox, & O'Hanlan Souder, 2006), such obstacles still exist (Klieger & Wagner, 2014). Additionally, the foci of preservice teachers' action research endeavors tend to be technical in nature rather than critical (Clarke & Fournillier, 2012; Gore & Zeichner, 1991). This could be in large part due to the inexperience of candidates who are, in many ways, more focused on the context (e.g., behavior management) and discrete skills of their teaching than the content or process (Ridley, Hurwitz, Hackett, & Miller, 2005). Preservice programs that have recognized and addressed this tendency for reflection during action research have reported greater development of reflection in their candidates (Hagevik, Ayeniz, & Rowell, 2012). Additionally, there has also been a warning call by scholars to refrain from romanticizing the effects of action research on preservice teachers (Zeichner, 2009).

Surprisingly, a paucity of research exists concerning how candidates, who develop an inquiry stance and operationalize it through action research, maintain that stance after graduation. To address this gap, we studied our candidates at the conclusion of their action research and one year after completion. We asked the questions: How do candidates view the role of action research in their teaching during their internship and first year of teaching? To what extent do graduates maintain and express an inquiry stance during their first year of teaching?

Methods

Description of the PDS Program

The Elementary Education program is a thirty-nine credit hour licensure plus M.Ed. program that uses a Professional Development School (PDS) model. At the time of this study, there were three program tracks. Tracks 1 and 2 included two 8-week internship placements during one semester. Track 3 consisted of two 16-week internships that spanned two semesters. At the time of this study, each track culminated with a capstone action research course taken the summer following student teaching. Prior to the semester of this study, candidates in the program did not conduct any actual action research; they took the capstone course and developed a hypothetical study. Faculty realized that this was not the best way to prepare teachers for development and enactment of an inquiry stance.

To address this issue, candidates then began conducting action research during their full-time internship, but at this point, the capstone research course was unable to be moved. Throughout four weeks of independent teaching during their fulltime internship, candidates engaged in action research. Since the capstone research course occurred the semester after student teaching, other supports were provided to scaffold the candidates as they completed their research. Four workshops were held at the beginning of the term to provide an overview of action research. The focus of these workshops was understanding what action research is and how to choose an area of inquiry and design a study. An action research guidebook developed by program faculty was provided to each teacher candidate. Faculty who were familiar with action research held regular meetings with university supervisors to help them understand the process and its desired outcomes. University supervisors then held regular meetings throughout the internship with candidates where candidates shared their research processes and ongoing findings. At the conclusion of their internships, candidates shared their action research findings with their school sites. Further analysis of data and preparation of findings were addressed in the summer research course.

Candidates' action research spanned a variety of topics and complexities. Their studies included the investigation of behavioral techniques, instructional strategies, and inquiry regarding social-emotional outcomes. The foci of candidates' studies were developed from wonderings they discovered during their teacher preparation experiences. Faculty worked with candidates to uncover their inquiries and develop researchable questions. Candidates were directed to examine existing research on their topics to help them clarify and mold their questions. While faculty helped them in this process, this research process allowed the candidates the space to design their own inquiry. Candidates' studies were assessed during the research course when they submitted a full research report. The research report included a literature review and a detailed report on the research process, findings, and implications. It also included an opportunity for candidates to reflect on their research process and subsequent learning.

Participants

All participants were graduate students in the elementary education master's licensure program at a large mid-Atlantic public university. Twenty-six candidates completed an exit survey at the conclusion of their action research. One year later, ten of twenty-six candidates participated in follow-up interviews. These ten participants were graduates of the program who were all completing their first year of full-time teaching in local elementary schools. Nine were teaching in public schools, while one was employed in a private school.

Data Collection

Survey. A survey was administered using Survey Monkey following the completion of the capstone research class. The survey consisted of eleven questions, which included one demographic question, three open-ended response questions, five Likert-scale questions with optional open-ended responses, and one yes/no question with optional open-ended response. The final question asked if participants were willing to be interviewed at the conclusion of their first year. If they responded yes, they could enter their contact information into the survey or, if they wished to keep their responses

anonymous, email the lead researcher with their contact information. Twenty-six participants from across the three program tracks responded to the survey. Of the three program tracks, 38% of the respondents were in Track 1; 35% were in Track 3; and 27% were in Track 2. Responses were anonymous, unless participants indicated that they would be willing to participate in a follow-up interview at the end of their first year. Survey questions asked about such topics as helpful supports, readiness to make changes to instruction based on data, views of teaching, role as a teacher, and likelihood of engaging in action research as professional development in the future.

Interview. The final survey question included consent to be interviewed following their first year of teaching. Eleven survey respondents indicated they would be willing to participate in the follow-up interview. Ten of the eleven were able to be contacted for a follow-up interview at the end of their induction year of teaching. The semi-structured interview included eight questions and was completed in person or over the phone. The ten respondents represented the three program tracks: Track 1 (n=4), Track 2 (n=4), and Track 3 (n=2).

Data Analysis

Likert-scale survey responses were analyzed using descriptive statistics. The interviews and open-ended survey responses were analyzed inductively (Hatch, 2002). Interviews were audio-recorded and then transcribed. Three of the authors conducted open coding of the data and then met to develop shared codes. The transcripts were read repeatedly and salient domains were identified and coded. Data was reread and a record was kept of evident relationships within the data. Then, we looked within the domains for richer representations. Finally, we searched for connections, or themes, across domains. The themes are represented in our findings below. The other two authors, who were program graduates and study participants, member-checked the findings. They read all the findings, discussed them with the other authors, and confirmed that the findings represented their own experiences.

Findings

Survey

In order to determine how candidates maintained their potential inquiry stance after graduation, we first wanted to gain an understanding of how graduates viewed their action research experience and its influence on their learning and reflection. We administered a survey to candidates at the conclusion of their action research after they took the capstone research course.

Perceptions of action research experience. According to the survey responses, 73% of participants felt that action research affected how they viewed their teaching, 92% of participants felt ready to make changes to their instruction based on data, and 65% felt likely to very likely that they would participate in this type of professional development when they began teaching (see Table 1).

Concerning how action research affected their view of their teaching, candidates' short answers varied. There were expressions related to change in confidence, willingness to take risks, and enhancing their awareness of their actions (see Table 2).

Candidates also noted that action research contributed to the systemization of their practice. As one candidate stated, action research enabled her to operationalize what she 'knew' about being a good teacher:

> I know that good teachers make changes to their lessons and instruction methods based on feedback (both formal and informal) from their students. I hadn't thought about this being a formal process, but the action research process showed me the benefits of having a specific question or wondering in mind when analyzing one's teaching. This then allows the teacher to focus his or her attention on the question at hand.

Another participant, who actually conducted action research during her first year of teaching, passionately explained its influence on her teaching:

> Action research allows you to look at your classroom, see what works and what doesn't, and then attempt to change it in a systematic way that enables you to collect data, analyze it, and then either reformulate the question or strengthen its results. I think that it is truly the best way to not only assess your students but self-assess your own instruction. I don't really see myself teaching without it.

Table 1. Survey Results

	Very Likely	**Likely**	**Unlikely**	**Very Unlikely**	**Neutral**
How likely are you to engage in action research when you begin teaching?					
Track 1	3 (30%)	5 (50%)	0 (0%)	0 (0%)	2 (20%)
Track 2	1 (14%)	2 (29%)	0 (0%)	1 (14%)	3 (43%)
Track 3	2 (22%)	3 (33%)	2 (22%)	0 (0%)	2 (22%)
	Very Ready	**Ready**	**Unready**	**Very Unready**	**Neutral**
How ready do you feel to make changes to your instruction based on data?					
Track 1	2 (20%)	8 (80%)	0 (0%)	0 (0%)	0 (0%)
Track 2	1 (14%)	5 (71%)	0 (0%)	0 (0%)	1 (14%)
Track 3	2 (25%)	5 (63%)	0 (0%)	0 (0%)	1 (12%)
	Yes	**No**			
Did your action research affect how you view your teaching?					
Track 1	9 (90%)	1 (10%)			
Track 2	4 (57%)	3 (43%)			
Track 3	6 (67%)	3 (33%)			

Table 2. How Did Action Research Affect Your Teaching? Short Answer Response Summary

	Number of participants	Representative responses
Changes in confidence	3	I picked to do my action research in an area (math), I wasn't as comfortable in teaching. After conducting my search, I now have more confidence in teaching math using hands-on activities.
Willingness to take risks	2	It showed me that you have to be willing to try new things to make improvements in the classroom
Enhancing awareness of their actions	9	Action research allows you to look at your classroom, see what works and what doesn't, and then attempt to change it in a systematic way that enables you to collect data, analyze it, and then either reformulate the question or strengthen its results. I think that it is truly the best way to not only assess your students but self-assess your own instruction. I don't really see myself teaching without it.
Systemization of practice	3	I know that good teachers make changes to their lessons and instruction methods based on feedback (both formal and informal) from their students. I hadn't thought about this being a formal process, but the action research process showed me the benefits of having a specific question or wondering in mind when analyzing one's teaching. This then allows the teacher to focus his or her attention on the question at hand
No short answer response	2	

While the majority of participants viewed action research as influential to their teaching, seven participants felt that the process was redundant since they had already "entered teaching with a reflective attitude." One participant, in particular, viewed the formal action research process as a burden because she believed her teaching to be independently inquiry-oriented. She stated, "I found the entire process/ project/ paper to just be a formality for a process I already use. The AR assignment

just caused unnecessary stress and time during my student teaching." This participant also shared that her university supervisor found the action research process to be "unrealistic, given [her] time-constraints and the fact that [she] did not have enough time to get to know the students before implementing a change." This participant's program track consisted of two 8-week internships during one semester. Although this candidate was enrolled in a faster-paced track, she was the only survey participant in that track with such a perspective; all other survey respondents in her track found action research to be influential in how they perceived their teaching.

Supports. We also asked participants about supports that they felt were most helpful during their preservice action research. In their open-ended answers, respondents cited human resources at the school as being the most significant factor contributing to their perceived success with action research. Human resources included their mentor teacher, university supervisor, fellow interns, and/or content/pedagogical specialists at their school. Highlighting this, survey responses indicated that mentor teachers' involvement was positively related to participants feeling that action research affected their teaching. Survey responses also indicated that the there was a positive relationship between the perceived involvement of the university supervisor and the perceived involvement of the site facilitator. The site facilitator in our PDS model is a school-based instructional faculty member who serves as a liaison between the university and the school. We do not have further data about this relationship. However, we interpret this finding as promising for the influence of collaboration between university and school on candidate success. Only one participant noted that none of their PDS human resources (mentor teacher, site facilitator, university supervisor) were helpful regarding their action research. Upon beginning the integration of action research into the internship semester, the faculty deliberately sought to engage all PDS partners in facilitating action research with candidates. It seems from these findings that this joint facilitation was important to candidates' processes, but we still have work to do to ensure all interns are adequately supported and that all partners feel and communicate the value of action research to developing inquiring graduates.

The capstone research course was cited as the second most helpful element for candidates, although, perhaps unsurprisingly, most respondents shared that they would have found it even more helpful before or during their action research. This finding led program faculty to make the capstone course concurrent with the internship. Hopefully, this adjustment will produce greater consistency of information for candidates.

Interview

To answer our second research question, ten graduates participated in a follow-up interview one year after graduation. At this time, the participants were at the end of their first year of full-time teaching. These interviews questioned graduates' teaching contexts, potential influence of action research on their teaching to ascertain their enactment of an inquiry stance, readiness for data use, barriers to conducting action research during their first year of teaching, and their views of themselves as teachers. We begin our findings by reporting on the context of participants' first year. This initial report establishes the environment in which our participants did or did not enact an inquiry stance. Next, we present our findings according to themes related to the influence of action research on participants' teaching.

Teaching contexts. In their interviews, participants described their first year in nuanced ways. Primarily, they described it as challenging, but also explained that it was filled with learning. As one participant noted, "it was wonderful, awesome, amazing, horrible, stressful, worst, and best year." The schools in which participants worked were diverse in student demographics and school cultures, with school cultures being described as individualized, balkanized, or embodying characteristics of professional learning communities (Hargreaves & Fullan, 2012). Across school cultures, all ten participants described beliefs and actions that aligned with an inquiry stance. During their interviews, they consistently came back to a description of themselves as a teacher as a facilitator and coach, community builder, safe adult, and partner. Acting as a facilitator/coach/community builder requires a great deal of reflection and inquiry. They communicated that they were continuously asking questions and seeking answers to best address the needs of their students. In the development and enactment of their stances within these varying environments, participants noted action research as being influential in different ways. These ways are described below.

Influence of action research. As participants talked about their experiences with action research and its influence in their teaching, they revealed their stances toward inquiry in three main forms.

Action research topic. When asked if their teaching this first year had been influenced by action research in any way, three of the ten participants noted that the topic and findings of their preservice action research informed their teaching during their first year. For these two participants, they saw the influence of action research in a more application-oriented way. That is, they focused less on how the process impacted them, and more on how they were able to apply what they learned instructionally. One participant described action research in the following way:

> My action research [in the program] was very focused on ELLs and on students from more impoverished backgrounds and how to build their vocabulary. And, because I spent a lot of time reading and researching that [in the program], I already had that knowledge base when I came in to teach. So, it was more about finding the curriculum that worked best and figuring out how to implement that in the classroom. It wasn't having to learn a whole new system at once.

These participants described themselves in ways consistent with teachers as knowledge-generators (versus knowledge consumers). They generated new knowledge for themselves during their action research and that knowledge informed their practice. This view of themselves was empowering as they moved into their first years of teaching because they, now, had the skills to keep generating knowledge, instead of only passively consuming it.

Facility with data. All ten participants talked about being ready for data use in their first year, but six participants explicitly connected this understanding and skill to conducting their preservice action research. They described a greater facility with data that was advantageous in their data-driven school environments.

Participants often talked of collecting their own data and using testing data to analyze student progress and determine next steps. Data-driven decision making, the systematic collection and analysis of data to inform instructional decisions (Hamilton, Halverson, Jackson, Mandinach, Supovitz, & Wayman, 2009; Mandinach & Gummer, 2015), was overwhelmingly represented in participants' responses. They attributed their preparedness for data use to the program and, specifically, to action research. There was talk of how their confidence and skills with data enhanced

their willingness to take risks because they could monitor their outcomes. They also spoke of data as enhancing their responsiveness to student needs. As two participants stated:

> [Action research] definitely affected the way I look at data and- and just trying to find little ways and- I feel like I was more, more willing to change what I was doing in order to see if it caused any effects.
>
> [Action research] also helped me in understanding why you need data to show- It helped me to see okay, this is how you connect and identify needs beforehand and adjust your instruction to meet those needs.

Additionally, two participants likened the data collection of action research to the goals they had to create and track for their yearly evaluation.

> I feel like the task was a lot less overwhelming for me than other people...I feel like having done something very similar to SMARTR goals, last year, helped me understand the importance of giving a pre-assessment and giving a post-assessment and working in the middle and collecting that data.

All participants who talked about data did so in terms of data-driven decision making, which may or may not have been explicitly demonstrative of a reflective inquiry stance. However, data is essential to investigating those questions and wonderings that arise for reflective teachers. It seems that teachers were often pushed to follow their wonderings or be more responsive to students because they felt an increased confidence with monitoring impact.

Action research and micro-inquiries. Two participants noted that they conducted action research their first year and three participants named specific action research ideas for year two. However, all ten participants described actions that embodied what we termed 'micro-inquiries.' These micro-inquiries began for participants with a question about their practice, investigation into possible actions, acting based on what they learned, and then evaluating the outcomes. These were not formal action research endeavors, but without necessarily meaning to, the participants engaged in the action research cycle; they enacted an inquiry stance naturally in their practice:

> If I see a problem in the classroom I'll do the research what other people have done and then I'll, I might try it myself, and then you know... see whether, or not, it works. Which is, I mean, it is definitely action research, but it's not as formalized.
>
> I didn't write anything down. But, I was constantly reflecting and thinking of different ways to do things, and talking to different people, and researching kind of in our ways. But, never did I make it official or anything.

Participants cited several barriers to conducting a formal action research effort their first year. These barriers were both external and internal. External barriers included the workload of their first year and the volume of paperwork they were expected to complete. Although participants all engaged in a PDS internship where they worked closely with their mentor teachers and the school and felt very involved in the day to day life of teaching during their internships, they could not anticipate the added responsibilities of being the teacher of record. Their first year was spent trying to navigate the immense workload of teaching. This led into a second cited external barrier: time. Despite the program's attempt to demonstrate to candidates the potential integration of action research into what they already do, many participants still saw formal action research as an add-on to their responsibilities: "[I haven't done formal action research due to] the sheer volume of documents and paperwork that I'm currently doing... I feel like I never even have any time to get all this stuff done."

Finally, two participants noted that there was a lack of value placed on action research among their colleagues. Because colleagues did not see a place for it, as the first-year teacher, they did not feel it appropriate to move forward with the effort:

> When I mentioned action research, because I did it with one of my goals with math this year, there really is no interest. I don't know if that is like behind the times from the public school, or if it's that we have such an open environment, smaller, that you don't need a formal regimented [process] as action research. But, there really is no, "OH YEAH!" No fire, no passion, behind it.

The internal barriers cited by participants aligned with these external obstacles, particularly the feeling to just want to "get through the year." As a first-year teacher, participants felt that they were just trying to find their footing in the first year and develop strategies for organization and managing their workload. They often felt overwhelmed and, to them, action research was not something even on their radar. Interestingly, another barrier cited by participants involved perceptions of data. Even after conducting action research and taking a graduate research course in which they learned about multiple sources of both quantitative and qualitative data, almost all participants described their data use during their year as majorly quantitative. Two participants particularly shared views that connoted data as being *merely* quantitative. They shared a reluctance to engage in action research because, in their estimation, they had questions about their classrooms that were not quantifiable, and therefore not worthy of research. As one participant shared:

> "Reading groups are anecdotal...And, I dunno, I feel like for me it's more difficult to measure... like if I was doing action research, if it was working based on anecdotal then, when I am looking at math I am going okay they are getting 1 out of 2 and now they are getting 2 out of 2, you know. I dunno, for me that's more difficult. That probably has something to do with it. Because so much of it, I mean really, math is the only thing in k-1 that you have those number raw scores for. Everything else is more observation, and interaction with the kids, and anecdotal and things like that."

This raises the question of how to legitimize qualitative data when typical data-driven instruction, as realized in schools, emphasizes quantitative data over all else.

Discussion

In response to a dearth of literature regarding the development and maintenance of an inquiry stance for preservice teachers after graduation, we investigated the research questions: How do candidates view the role of action research in their teaching during their internship and first year of teaching? To what extent do graduates maintain and express an inquiry stance during their first year of teaching? From our post-action research survey, pre-service candidates were well on their way to developing an inquiry stance towards their teaching and felt positively about action research's potential as a professional development tool. One year later, we found that participants were clearly using data, asking questions about their practice, acting for their students, monitoring impact, and reflecting. According to Cochran-Smith and Lytle (1999) this questioning of one's own practice is at the heart of an inquiry stance. The findings in this study demonstrate that teachers who engage in a continuous cycle of asking questions and seeking answers hold an inquiry stance. Participants in this study met all three of Ravitch's (2014) requirements for an inquiry stance: they were metacognitive

about their self-reflection; they questioned their practice daily; and they focused on improving their professional practice. Only two participants engaged in formal action research, but all ten participants noted their engagement in micro-inquiries as part of a reflective teaching cycle. Their micro-inquiries resulted from the participants' questioning of their own practice through engagement in the action research cycle.

Based on our results, it seems that action research can be a way to empower novice teachers to act. Even if they were not conducting formal action research, they were consistently engaging in inquiry and action. Their responses indicated that action research had an impact on their ability to "notice" issues and recognize their questions about student learning. As one participant shared, "whether it be formal research, I think I'm always doing research in my class." From our study, we can, with confidence, conclude that action research is a strong vehicle for learning data-driven decision-making skills. Recommendations by Hamilton and associates (2009) include teachers making "data part of an ongoing cycle of instructional improvement." Participants' use of data to determine student strengths and needs and, then, drive instruction was clear.

What was less clear was how participants were enacting a stance that problematized larger classroom and or school arrangements or overtly questioned the power of their settings. As we analyzed our data, we were struck by how few participants noted structural or cultural wonderings. Participants described micro-inquiries that were soundly instructional, and while they seemed to consider their role in students' successes or failures, they did so in order to offer instructional fixes related to achievement measures. This caused us to wonder if we as a faculty *expected* to see evidence of this questioning the larger power structures of schools in graduates who engaged in action research during their program. For example, were we assuming that an inquiry stance would inherently foster enough agency to move program graduates to challenge issues of social justice? The results of this study provide evidence of a clear need for a broader conversation among the faculty as to what we want student teaching action research to accomplish and how we might develop structures and cultures to enable those goals.

These data also led us to realize that we need to be clear about differences in terms and concepts: critical reflection, data-driven decision making, and inquiry. While these concepts overlap in key ways, we had many conversations about whether participants were really expressing an inquiry or reflective stance. As a research team, we struggled with the implications of defining these terms, realizing the need for a faculty-wide conversation. How we conceptualize these terms and approach action research with our candidates might have profound impact on their development and maintenance of an inquiry stance.

Program Changes

Our findings affected our PDS program in very strong ways. Survey data revealed that the teacher candidates would have modified their action research in ways they felt would have strengthened it if they had taken the action research course prior to conducting their own action research. As a result of these data, the course sequence was modified and the capstone course is now taken concurrently with the final semester of internship, during which action research is conducted. This aligns the program with many other teacher preparation programs that include action research as a component of student teaching (Lattimer, 2012; Zambo & Zambo, 2007). The course is front

loaded so that it does not meet during the teacher candidates' four-week period of independent teaching. The movement of this course provides the teacher candidates with regular, systematic support from their course instructor while they engage in action research. Teacher candidates now have the ongoing support of their course instructor in addition to their university supervisor. The candidates are organized into course sections by school site, which provides additional systematic support during the action research process. They have peers in their course who understand their specific school settings, who can offer support and enable the creation of professional learning communities (Hord, 2009; Vescio, Ross, & Adams, 2008). On-site instruction in PDS schools allows the course to be open to practicing teachers, which could foster more collaborative research.

Future questions may include an examination of joint action research between a teacher candidate and their mentor teacher. Regular collaborative school-based meetings between university supervisors and candidates were encouraged during the time of this study, but were not necessarily conducted by all supervisors. Since the capstone course is taught by university faculty and is now concurrent with the internship, it is our hope that the unevenness of support from university supervisors will be mitigated by this relocation of the course in the sequence. Additional data need to be gathered to discern how the most recent change in the course sequence/structure affects graduates' inquiry stance during their first year. This study was an important first step in investigating the development and maintenance of candidates' inquiry stance. However, more research is needed to address some of the questions raised by this initial study.

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Collaborative Professional Development School (PDS) Action-Research Classroom Studies for Change and Improvement

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Abstract: In this article, the authors present their collaborative PDS action research aimed at changing and improving classroom teaching directed at pupil learning and achievement. The classroom action-oriented studies take place within a two-year New York State grant project funded with Race-to-the-Top monies for strengthening teacher and leader effectiveness. Two of the 29 classroom studies included in the project are featured in this article. One action study focuses on third-grade mathematics. The collaborators of the study aim to increase pupil engagement through differentiated instruction and then link it to pupil achievement in solving word problems in mathematics. In the second study, two fourth-grade teachers and a teacher candidate collaborate to improve the quality of their pupils' writing and identify the impacts of transferring the editing and assessment process from teachers to pupil(s). Sample data and findings from the two studies are presented.

KEYWORDS: clinical experiences, school-university partnerships, professional development schools, action study, field experiences, observational tools, frameworks, pupil engagement

NAPDS NINE ESSENTIALS ADDRESSED:

1. A comprehensive mission that is broader in its outreach and scope than the mission of any partner and that furthers the education profession and its responsibility to advance equity within schools and, by potential extension, the broader community;
2. A school–university culture committed to the preparation of future educators that embraces their active engagement in the school community;
3. Ongoing and professional development for all participants guided by need;
4. A shared commitment to innovative and reflective practice by all participants;
5. Engagement in and public sharing of the results of deliberate investigations of practice by respective participants
6. An articulation agreement developed by the respective participants delineating the roles and responsibilities of all involved; and
7. A structure that allows all participants a forum for ongoing governance, reflection, and collaboration;

8. Work by college/university faculty and P–12 faculty in formal roles across institutional settings; and
9. Dedicated and shared resources and formal rewards and recognition structure.

Introduction

In this article, teachers and researchers describe their collaborative Professional Development School (PDS) action research aimed at changing and improving classroom teaching directed at pupil learning and achievement. The classroom studies took place within a larger research study that was housed in a New York State (NYS) grant project funded with Race-to-the-Top (RttT) monies.[1] The project, entitled *CLIPS – Career Ladder Innovator Programs and System*, was based in a 14-year old, holistic PDS Partnership between Dowling College and the North Babylon School District (NBSD) in New York.[2] Throughout the years of the partnership, and specifically the partnership with the Belmont Elementary PDS, its members have used classroom inquiry tools and procedures developed by Catelli (2010b) for conducting a number of the partnership's PDS video-based action research studies.[3] The data and findings from the studies were used to initiate, monitor, and demonstrate change and improvement in (a) classroom teaching, (b) the teacher preparation program, (c) program accreditation, and (d) the organizational structure and operation of the PDS partnership between the college and school district. Over the years of the PDS partnership, its members have successfully accomplished:

- The initial preparation of over 200 teacher candidates using the holistic-partnership approach. [4] The clinical program was cited as exemplary in two reviews of the National Council for the Accreditation of Teacher Education (NCATE).
- Provision of services to over 3,000 youngsters including improvement in test scores.
- Over 55 action-research studies to initiate change and improvement.
- Numerous publications of books, chapters, and articles.
- Frequent speaking engagements and research presentations at national and international conferences.
- A digital library of over 100 video recordings of classroom teaching, and a data bank of action-research findings.

Largely because of the partnership's successful track record, the school district won over one half million dollars of RttT monies from NYS to fund the *CLIPS* grant project. Classroom action studies were an important part of the project. Two of the 29 classroom studies included in the *CLIPS* grant project are spotlighted in this article. The studies involved analyzing pupil data, assessing video-recorded lessons of classroom teaching, and then measuring the changes that took place over time.[5] The teachers who conducted the studies have been PDS teachers and action researchers for many years. They collaborated with their teacher candidates and the project's resident professor and PDS director-researcher to conduct the studies. Using a variety of observational tools, validated teaching rubrics, and pre-and-post exam scores, changes in classroom instruction and pupil performances were measured over a three-month period of time. Video-recordings of teaching performances, as well as pupil performance on exams, exit tickets, and worksheets were all used as primary sources of data to measure change and provide evidence

of improvement. Additional sources of data such as written lesson plans and pupil survey responses were also examined and used as evidence of positive instructional change and pupil achievement. All 29 teachers of the *CLIPS* project employed action research methodology and video-based classroom inquiry tools to conduct their studies.

The two *CLIPS* teachers whose studies are featured in this article are third, and fourth-grade teachers at the Belmont Elementary PDS. They are the second and third authors of this article. In the following sections, each teacher in her own voice will provide more information about her classroom action study. Sample data and findings will also be given. The two teachers have extensive experience in PDS work. They have served as PDS supervisors, course instructors, seminar leaders, action researchers, and conference speakers. Also, each has been a recipient of the *Claudia A. Balach Teacher Researcher Award* sponsored by the PDS Research Special Interest Group of the American Educational Research Association. I, the lead author of this article, have also received the award. I have written this introduction, and I should mention that I have served as the director of the holistic PDS partnership for over 16 years.

In performing the grant activities, and in conducting their studies, each of the two PDS teachers was assessed at a high level. Their performances were assessed at a high level in that they were able to make linkages between their instructional actions and pupil learning and achievement. They were able to do so more often than others in the project who were just beginning to prepare their classrooms as PDS classrooms. Also, they guided and counseled others during the *CLIPS* workshops and course-experiences, oftentimes drawing upon their own PDS experiences and leadership skills. It should be noted that all of the 29 teachers who volunteered for the grant project were required to participate in a series of *CLIPS* training workshops and a graduate course. The workshops and course were aimed at developing analytic data skills, leadership practices, and research competencies. The skills and competencies (e.g., observing and assessing classroom teaching) are related to the national *Teacher Leader Model Standards* (Teacher Leadership Exploratory Consortium, 2008), and a set of adapted Standards for PDS Teacher-Leader Innovators (see Catelli, Carlino, Petraglia, Calascibetta, Marino & Jackson, 2017 for the adapted Standards). Also, they are the skills and competencies that were embedded in the *CLIPS* professional positions identified on the new career ladder for teachers. All 29 teachers were in training for the new position of Teacher-Leader Innovator. Their classrooms ranged in grade levels from elementary to secondary, and were categorized as either emerging or established PDS classrooms.

One of the goals of the grant-funded project was to prepare teachers to collaborate with one another in Action Teams for conducting change and improvement at the classroom, school, and district levels. Teacher inquiry and collaborative action research were critical components of the project and important to actualizing that goal (Catelli, 1995). The challenge was to have teachers engage in classroom action studies and coach others to do so effectively, while concurrently having them design those same studies to contribute data to school and district improvement. In order to meet the challenge, the 29 teachers in training needed to first demonstrate during the *CLIPS* graduate course that they were able to collaborate with one another and make positive change occur in their classrooms. The two studies presented in this article are representative of that agenda. The studies, as well as the other 27 *CLIPS* classroom studies, were initiated by the following research-inquiry questions:

- What changes and/or improvements in instructional actions would you (the in-service teacher) want to make in your classroom that would favorably impact pupil learning and achievement, and strengthen or change your teacher candidate's teaching performance?
- Did change and/or improvement occur over the period of time (three months) allotted for the study? What evidence do you have to support that change did occur in the desired direction?
- How was time spent during a lesson, and how well did the teacher candidate (or the candidates as a group) perform the instructional actions (or rubrics) that were targeted for change and improvement?

The first study presented below focuses on third-grade mathematics. The PDS teacher and teacher candidate co-taught the lessons of a unit of instruction in mathematics with the teacher candidate oftentimes taking the lead role for teaching the lessons. This classroom study was aimed at increasing pupil engagement through differentiated instruction and linking classroom instructional actions to pupil achievement in solving word problems in third-grade mathematics.

The second study was conducted in two, fourth-grade classrooms. In this study, two fourth-grade teachers and a teacher candidate collaborated with one another to improve the quality of their pupils' writing, and to identify the impacts of transferring the editing process from teacher to pupil(s). One of the teachers is the third author of this article. Data were collected regarding (a) pupils' classroom performances, (b) performance scores obtained from writing an explanatory paragraph, (c) pupils' knowledge of simple machines, and (d) the two teachers' and teacher candidate's rubric ratings of their classroom teaching performances.

Classroom Action Study I

For the study, my teacher candidate and I decided to focus on multiplication word problems in third-grade mathematics. Based on our assessments, we both agreed that the unit in mathematics would be a good one to improve pupil performance and achievement. In the past, pupils have had difficulty in solving multi-step multiplication word problems. Lessons on the topic usually needed to be re-taught. Oftentimes, when pupils were given problems to solve, many of the youngsters had difficulty in knowing when to use the associative property of multiplication and when to use the distributed property. We thought that if we focused on implementing differentiated instruction, while emphasizing the different modes of learning (e.g., auditory, tactile, visual), then those teaching moves would increase pupil engagement and subsequently increase pupil performance scores and their abilities to solve multi-step multiplication word problems. We also used peer tutoring as an instructional tactic for having pupils become more involved and engaged during a lesson.

Our goal, as outlined in the three research-inquiry questions previously cited, was to change and improve classroom teaching directed at favorably impacting pupil learning and achievement. The principal investigator and professor of the course asked us to place the first research-inquiry question in the context of the Instructional Domains of two teaching frameworks and rubric systems approved by NYS. The first teaching framework was the Charlotte *Danielson's Framework for Teaching Evaluation Instrument* (Danielson, 2011), while the second was the *New York State United Teachers Revised Practice Rubrics* (NYSUT, 2012).

Based on the purpose of our study, and an examination of the teaching rubrics included in the systems, we targeted the following rubrics or instructional actions as areas to strengthen:

Danielson's Revised Teaching Framework (2011):

- Engaging Students in Learning (rubric 3c)
- Using Assessment in Instruction (3d)

NYSUT (2012):

- Engaging Students (1C)
- Questioning Technique (2B)
- Differentiating Instruction (4A)
- Using Formative Assessment (6A)
- Providing Feedback During and After Instruction (6B)

The Adapted Flanders Observational Category System of Interaction Analysis (Catelli, 2010b):

- Gives Corrective Feedback (category 2b)
- Accepts, Uses or Extends Ideas of Pupils (3)
- Pupil Talk-Response to Questions (8a)
- Pupil Engagement - Participating in a Task, Activity or a Discussion Group (8b)
- Observation – Teacher Observing Pupils (10b)
- Teacher Talks and Pupil Illustrates and/or Demonstrates (12)

An Action Plan for the Study

My teacher candidate and I designed and implemented a plan for conducting the study. First, we taught a lesson on word problems in mathematics using didactic teaching. After the lesson, we gave a pre-test and then examined the data and pupil grades to determine areas of weakness. We identified multi-step multiplication problem solving. Next, and based on our analysis of the more frequently occurring errors, we designed three lessons for a mini unit. The mini unit was designed to revisit the concepts and skill areas for solving two-to-four step multiplication word problems in elementary mathematics. Based on our analyses of all the data we had collected, we created performances objectives and progressive learning tasks for each of the three lessons. The performance objectives, tasks, and materials were tailored to meet the varying learning needs of the pupils. The ultimate objective was to have pupils solve multi-step word problems identifying when to use the associative property of multiplication and/or the distributed property of multiplication. We employed differentiated learning for our auditory, tactile, and visual learners. Pupils were arranged in one of three groupings: (1) remedial, (2) average, and (3) above average. We gave exit tickets for pupils to complete after each of the three, 45-minute lessons. Also, we video-recorded each of the three lessons.

Collection and Analysis of Classroom Data

We used *The Adapted Flanders Category System of Interaction Analysis* (Catelli, 2010b) to collect and analyze the video data on classroom teaching. That observational system captures both teacher and pupil behavioral actions and interactions. We coded the video recordings and then analyzed the data quantitatively. The resulting data provided us with the frequency of occurrence of an instructional action, and the percentage of time we devoted to an instructional act included in the system (e.g., asking questions; giving corrective feedback, etc.). That approach to analyzing classroom video data told us "how time was spent" during a lesson. In addition, we assessed the teaching performances of the lessons seen on the video-recordings using an adjusted rubric-rating scale for the two rubric systems. The ratings on the adjusted scale ranged from 1.0 and 1.5 (low) to 3.5 to 4.0 (high). We then computed mean performance scores or ratings. The resulting mean scores told us "how well" the teacher performed each instructional act (or teaching rubric) for each lesson. We call that our qualitative approach to analyzing data. Each lesson was analyzed quantitatively and qualitatively. The quantitative-qualitative approach to analyzing video-recorded classroom teaching of lessons was developed by Catelli (2010b). The approach was used in most of our PDS action research studies for over the 16 years of the partnership. In addition to examining the video data after each lesson, we also examined the results from the exit tickets, the worksheets the pupils had completed during the lesson, and the homework assignments they had handed in to us.

Sample Data and Findings of the Study

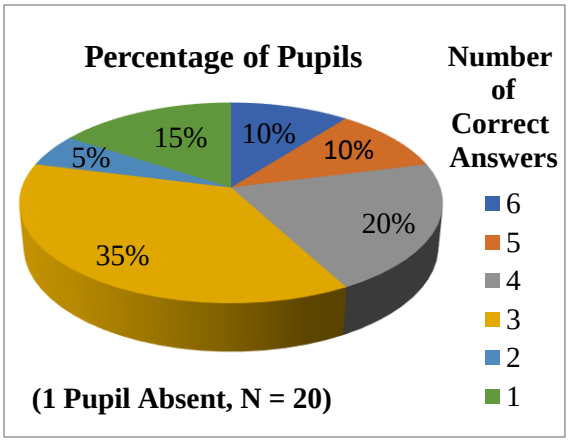

Figure 1. Percentage of pupils with correct answers to questions on the exit ticket after lesson 1.

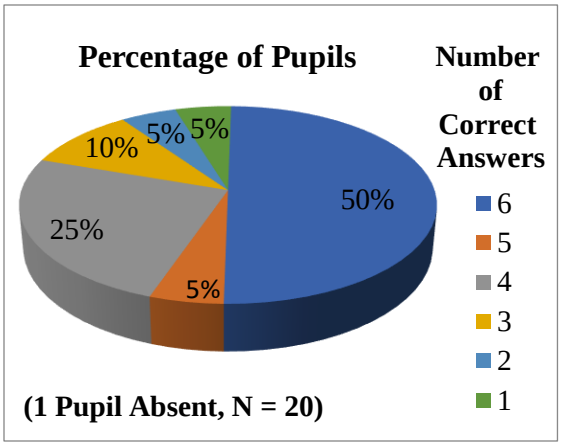

Figure 2. Percentage of pupils with correct answers to questions on the exit ticket after lesson 3.

Presented in Figures 1 and 2 are the percentages of pupils who answered the number of questions correctly on the exit tickets, for the initial lesson and for the third lesson. As you will note, the percentage of pupils answering all six questions correctly after the initial lesson was 10%, and after the third lesson 50%, an increase of 40%. That is, there were only two children who had

answered all of the questions correctly on the initial exit ticket, and 10 children who answered all of the questions correctly on the third exit ticket.

Seen in Table 1 is a comparison of the pre-and post-test numerical grades for each of the 21 pupils, along with the number of grade points that had increased for each pupil. Based on our examination of the pre-and post-test grades and other data, we found that:

- Each and all of the pupils (N = 21) increased their numerical grade and their ability to solve multi-step multiplication word problems.
- The increases in grade points ranged from five points (e.g., 85% to 90%) to 33 points (e.g., 46% to 79%).
- Six pupils had failing grades (below 65%) for the pre-test, while only two pupils received failing grades (55% and 60%) for the post-test.

Based on our comparisons and an analysis of all the pupil data, we concluded that all of the pupils (N = 21) increased their performance scores and their ability to solve multi-step multiplication word problems; and by the end of the mini unit, 19 of the 21 pupils met the minimum level of competency which was set at a grade of 65.

Table 1. Pre-and Post-Test Grade Results and Increases in Grade Points for Each Pupil

Pupil	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Pretest	80	88	89	61	25	46	45	67	56	81
Post-test	96	100	100	78	55	79	60	81	79	95
Points Increased	16	12	11	17	30	33	15	14	23	14

Table 1 Continued

Pupil	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**
Pre-test	77	78	68	55	69	72	45	91	85	78	91
Post-test	90	88	81	65	84	88	65	97	90	91	100
Points Increased	13	10	13	10	15	16	20	6	5	13	9

Regarding the classroom data that we collected from the video-recordings, shown in Table 2 is a comparison of the percentage of time that was devoted to each of the targeted instructional actions for the initial and final lessons:

Table 2. Percentage of Time Devoted to Targeted Instructional Actions

Instructional Actions	Initial Lesson	Final Lesson
Gives Corrective Feedback (category 2b)	10%	12%
Accepts, Uses, Extends Ideas of Pupils (3)	8%	10%
Pupil Talk-Response to Questions (8a)	11%	10%
Pupil Engagement -- Participating in a Task, Activity, or in a Discussion Group (8b)	7%	15%
Observes – Teacher Observing (10b)	15%	15%
Teacher Talks and Pupil Illustrates and/or Demonstrates (12)	9%	9%

Note. Percentage of time for the targeted instructional actions of *The Adapted Flanders Observational Category System of Interaction Analysis* (Catelli, 2010b).

By the third and final lesson you will note that "pupil engagement" increased substantially (7% to 15%). Were pupils more actively engaged by the third lesson? Based on the data and our observations, the answer is yes, absolutely! Do we think that an increase in "pupil engagement" was attributed to progressively implementing differentiated instruction and peer tutoring tactics? The answer again is yes. Do we think that the increase in pupil engagement favorably impacted pupil achievement of the objectives and their performance scores? Yes, we do believe that to be the case, especially so after we had analyzed all of the teacher and pupil data we had collected. Also, we should mention that there were other instructional actions that increased in terms of the percentage of time we devoted to them during a lesson. For example, the acts of "giving corrective feedback," and "accepts, uses or extends ideas of pupils" were both increased. Such instructional actions are particular to implementing differentiated instructions. We believe that these actions, as well as "teacher asking questions" and "pupils responding to questions" also contributed to pupil achievement.

At the end of the third lesson, we computed a mean performance score for each of the instructional actions that we had targeted from the *Danielson* (2011) and *NYSUT* (2012) rubric systems. The resulting mean performance scores or ratings, seen in Tables 3 and 4, provided us with information about "how well" the teacher candidate performed the targeted instructional actions (or rubrics) that are associated with differentiated instruction.

Table 3. Targeted Instructional Actions from Domain 3 of *Danielson's Teaching Evaluation Instrument and System* (2011)

Instructional Actions	Mean Scores
3b. Questioning/Discussion Techniques	2.5
3c. Engaging Students	3.0
3d. Using Assessment in Instruction	3.0
Overall Mean Performance Score	**2.8**

Note. Mean scores (or ratings) for the targeted instructional actions of the Danielson System (2011) performed by the teacher candidate for lessons using differentiated instruction. The adjusted rating scale ranged from 1.0 and 1.5 (low) to 3.5 to 4.0 (high).

Subsequently, we used the same procedure for the *NYSUT* System (2012), as seen in Table 4:

Table 4. Targeted Instructional Actions from the *NYSUT* System (2012)

Instructional Actions	Mean Scores
2B. Uses Questioning Techniques	3.0
1C. Engaging Students	3.0
4A. Differentiates Instruction	3.0
6A. Uses Formative Assessment	3.0
6B. Provided Feedback	3.0
Overall Mean Performance Score	**3.0**

Note. Mean scores (or ratings) for the targeted instructional actions of the NYSUT System (2012) performed by the teacher candidate for lessons using differentiated instruction. The adjusted rating scale ranged from 1.0 and 1.5 (low) to 3.5 to 4.0 (high).

In both systems, the mean scores obtained equate to "effective," and "proficient" performances. My teacher candidate did mention to me that studying the narratives for the rubrics, and incorporating them in her detailed lesson plans, were extremely helpful tactics for implementing the instructional actions during lessons.

Based on our final examination of all the teacher and pupil data, my teacher candidate and I believed that we did make "positive instructional change" happen in our classroom, and we did "favorably impact" pupil learning and achievement. And finally, we feel comfortable in saying that our classroom teaching, directed at pupil learning, was strengthened through this process. The classroom action research study helped us to solve an instructional problem and make change and improvement occur in our classroom in a more systematic way!

Classroom Action Study II

For this action study, I collaborated with a colleague, who teaches a fourth-grade class, and my teacher candidate. My teacher candidate was assigned to my classroom for one full semester prior to the study. All of us were members of Action Team 2 of the *CLIPS*, grant-funded project. My colleague and I are general education teachers at the Belmont Elementary PDS. Each of us has 25 pupils registered in our class. Within the context of the research-inquiry questions previously mentioned, the purpose of our study was to enhance the quality of our pupils' writing of an explanatory paragraph on simple machines by engaging them in the editing and assessment

process. In essence, we wanted to transfer the editing and assessment process to the pupils in our classrooms. Also, we wanted to identify the effects of that action.

Identification of the Problem

After having analyzed past writings of explanatory paragraphs on simple machines by our pupils, and after many discussions, we all agreed that the samples of writings we had reviewed were basic and lacked higher levels or ratings of quality. Also, we felt that our pupils were not taking responsibility for editing their own writing. We concluded that it would be important to improve pupil learning and achievement in this area by having them edit and assess their own work. We wanted our pupils to become more aware of the editing and assessment process and begin to monitor their own progress, as well as the progress and work of others.

Also, we wanted to see if they could independently, and with a partner, accurately score their explanatory paragraphs on simple machines. We were curious to know whether their new role in the process would in fact enhance the quality of their writing. Our goal was to have pupils achieve either a 3 or 4 rating using a writing rubric that they created as a fourth-grade group. In addition, we decided that our role in this unit would be that of a facilitator rather than a director of learning. We were partially influenced by the readings on effective teaching we had completed during the *CLIPS* models of teaching and learning class (see for examples Catelli, et al., 2009; Darling-Hammond, 2013; and Frey, 2010). Also, we knew that if we were to be successful we needed to plan and provide for more timely and specific feedback to pupils.

Area of Instructional Focus

Our area of focus was assessment and more specifically the *Danielson* (2011) rubric narratives for the instructional acts of "engaging students in learning" and "using assessment in instruction" (pp. 34-38). Both of these instructional actions coupled with the category of "engaging pupils" from *The Adapted Flanders Observational Category System of Interaction Analysis* (Catelli, 2010b) became the working framework for our observations and action study (pp. 109-111).

Action Plan

As a team of instructors for the unit, we first created a pre-and posttest on simple machines. Next, we designed performance objectives, lesson plans, and four power-point presentations for conveying information on each simple machine. Our intent was to have all of the fourth-grade pupils acquire the content and material in the same way. We also made sure to include exit tickets, and an adaptation of a pupil survey (see Rafal-Baer, Jablonski, & Vu, 2013 for the original pupil survey). We planned to give the survey after the fourth writing assignment. We further developed each lesson by including specific plans for progressively shifting the editing and assessment process to the pupils and emphasizing the teaching actions we had targeted. Also, we made plans to video-record the first and fourth lesson of the mini unit.

Implementation

By the second lesson of the unit, we had our pupils brainstorm and develop a writing rubric that they would then use to rate drafts of their explanatory paragraphs on simple machines. Pupils were arranged in groups of four. There were two pupils from class 4A and two pupils from my colleague's class, 4B. We wanted to ensure that everyone was working on the same page. Pupils worked together challenging one another to be creative and honest. We facilitated their discussions on the final wording of the "writing rubric." By the end of the group activity, all of the pupils were in agreement on the final rubric. They expressed that they now had a better understanding of the expectations for writing their simple-machine explanatory paragraphs. By the third and fourth lessons, pupils were using the rubric they had created. They used the rubric to edit and assess their own explanatory paragraphs and that of their partners.

Collection and Analysis of Classroom Data

For our action study, we collected data regarding (a) pupil classroom performances, and their rubric-writing ratings, (b) pre-and posttest knowledge of simple machines, (c) pupil feedback from exit tickets, (d) pupil perceptions from a final survey, and (e) teacher-rubric ratings, and the percentages of time we, as their teachers, devoted to the targeted instructional actions. We used the following observational tools to collect and analyze the video data:

- *Framework for Teaching Evaluation Instrument* (Danielson, 2011)
- *NYSUT's Teacher Revised Practice Rubric* (2012)
- *The Adapted Flanders Observational Category System of Interaction Analysis* (Catelli, 2010b)

We arranged for each of us to separately code and rate the video-recorded teaching performances of lessons so as to ensure reasonable reliability. For example, in using *The Adapted Flanders Observational Category System of Interactional Analysis* (Catelli, 2010b), my colleague and my teacher candidate each coded their own performance of lessons, and I coded each of their lessons. We aimed for at least 75% reliability -- matches of codes and ratings.

Sample Data and Summary of Findings

The data we obtained from using *The Adapted Flanders Observational Category System of Interactional Analysis* (Catelli, 2010b), in both classes, revealed that "pupil engagement" increased from the first lesson to the fourth lesson. My teacher candidate had a substantial increase in the time she devoted to that instructional action (49%). Table 5 lists the mean scores or rubric ratings for teacher performances of the targeted acts of "engaging pupils in learning," and "using assessment in instruction." Each increased from the first lesson to the fourth lesson.

Table 5. Teacher Performances of Targeted Acts

Teachers and Associated Acts	Lesson 1	Lesson 4
Engaging Pupils in Learning		
Teacher of Class 4A	3.5	4.0
Teacher of Class 4B	3.0	3.5
Teacher Candidate	2.5	3.0
Using Assessment in Instruction		
Teacher of class 4A	3.0	3.5
Teacher of class 4B	3.0	3.5
Teacher Candidate	2.0	3.0

Note. Targeted acts according to the *Framework for Teaching Evaluation Instrument* (Danielson, 2011). The rating scale ranged from 1.0 and 1.5 (low) to 3.5 to 4.0 (high):

In comparing the scores that the pupils received from the pre-and posttest on simple machines we found that:

- For Class 4A (n = 23), 18 pupils increased their numerical score, 2 pupils received the same score for the pre-and posttest, 2 pupils were absent for the posttest, and 1 pupil had no score recorded for either the pre- or posttest.
- For Class 4B (n = 21), 20 pupils increased their numerical score from the pre- to post-test, and 1 pupil had only a score from the posttest.
- Of the 43 pupils who took either one or both tests, 38 (or 88%) increased their knowledge of simple machines

The "writing rubric" that was created by the fourth-grade pupils, as a group, is seen in Table 6. The pupils used the rubric to edit and assess their writings of explanatory paragraphs, and that of their partners. In comparing the ratings for their initial piece of writing and their final writing of a paragraph on a simple machine, we found that:

- For Class 4A (n = 24), 2 pupils increased their rating, 17 pupils received the same rating, and 5 pupils were assessed at a lower rating.
- For Class 4B (n = 25), 11 pupils increased their rating, 9 received the same rating, 3 pupils were absent for completing the final piece of writing, and 2 pupils had no recorded data.

We decided to implement four additional lessons for Class 4A. My teacher candidate taught the four lessons. After the fourth additional lesson, we found that 9 pupils increased their rating from their last piece of writing, and 8 received the same rating. We were beginning to recognize how difficult it is to increase a rating or score in a short period of time. Also, we were somewhat surprised that pupils were close to or had matched perfectly with the ratings we had given them. For the most part, their ratings for their explanatory paragraphs, and that of others, were accurate.

Of the 43 pupils who took the ten-question perception survey, 18 pupils responded that they "felt comfortable self-editing their writing," 19 pupils "felt somewhat comfortable," and 6 "did not feel comfortable" at all. Thirty pupils said they "felt comfortable with partner editing," and 10 pupils "felt somewhat comfortable," and 3 "did not feel comfortable" at all. In response to the statement, "the rubric helps me make my writing stronger," 30 pupils agreed with the statement, 8 somewhat agreed, and 5 disagreed with the statement.

Table 6. Writing Rubric Created by Fourth-Grade Pupils

Criteria	4 Exceeds Expectations	3 Meets Expectations	2 Approaches Expectations	1 Not Yet
Structure of Paragraph (How it is set up and organized)	• Strong topic sentence • Lots of specific details • Strong closing sentence	• Good topic sentence • Three specific details • Good closing sentence	• Weak topic sentence • Few details • Weak closing sentence	• No topic sentence • No details/details are incorrect • Closing sentence doesn't restate the topic/no closing sentence
Content (Information)	• Specifically states the name of the simple machine and tells what it does, describes it, tells how it makes life easier, and gives examples	• States the name of the simple machine and tells: what it does, how to make life easier, and gives examples	• Missing 2-3 of the following details: • Name of the simple machine, what it does, describes it, tells how it makes life easier, and gives examples	• Missing 4 or more of the following details: the name of the simple machine, what it does, describes it, tells how it makes life easier, and gives examples
Grammar/ Mechanics	• Writes very neatly • Spells all words correctly • Has strong linking verbs, phrase, and vocabulary • Has correct punctuation and capitalization	• Writes neatly • Has some spelling errors • Has some linking verbs and phrase, and good vocabulary • Has some correct punctuation and capitalization	• Needs more research • Writes some complete sentences • Writes sloppy • Missing linking verbs, phrases, and vocabulary/weak vocabulary • Does not use correct punctuation and capitalization	• Doesn't stay on topic • Has inaccurate information • Writes very sloppy • Makes many spelling errors • Makes many punctuation and capitalization errors • Include many incomplete sentences

Information obtained from the exit tickets and feedback from pupils revealed that pupils liked having a rubric. They commented that with the rubric, and having created it, they knew exactly what was expected of them to get a rating of 4 on their written paragraphs. In my class, many pupils did not receive a rating of 4 on their final piece of writing on a simple machine. In fact, I saw little or no gains. My teacher candidate and I did notice, however, that pupils' confidence in their writing had changed for the better. We also noted stronger writing pieces that consisted of better sentence structure, punctuation, and an improved description of the topic. Pupils who had previously struggled with their writing were now engaged and wanting to write on a daily basis. That certainly signaled to us a significant change from previous attitudes. Through numerous private conversations with my pupils on their writing, many mentioned to me that when they wrote a paragraph they were striving to achieve a rating of 4. In my colleague's classroom, she noticed that a few of the pupils commented that the use of the rubric negatively affected their confidence in writing. She then went back and addressed the situation with those individual pupils to determine the reasons why they felt that way.

After examining all of the data, we concluded that we did see positive change occur in the instructional actions we had targeted, and we did impact learning favorably by shifting the editing and assessment process to pupils. Did pupils enhance the quality of their writing of explanatory paragraphs? We believe so. Now, pupils are taking more of an interest in their writing. Through this action study, we seemed to have established a better atmosphere and culture for learning. Pupils have more respect for one another; they are more willing to help their classmates with the writing and editing process, and that's a good thing.

Final Comment

Both of these classroom studies are excellent examples of collaborative, PDS action research for change and improvement. Each study demonstrates quite nicely the instructional and research linkages to improve pupil-and-teacher achievement. Also, each study promotes, rather successfully, the holistic integration of the four-pronged PDS model: preparation of pre-service teachers; professional development of in-service teachers; improved pupil learning and achievement; and the implementation of innovative inquiry and/or research designed to maximize learning and achievement at both the school and university levels.

Lastly, in this new chapter of the PDS movement, we as PDS leaders should be emphasizing PDS action research and classroom inquiry in our agendas for improving learning and educational practice. Also, we should be advancing PDS action research as a means for strengthening education and the American education workforce. The preparation and recognition of PDS teachers as teacher-leader innovators, researchers, and teacher educators is crucial to moving the PDS model forward. If we are to flourish during these years of federal and local change, we need to make sure that our research and classroom inquiry is precise, productive, and apparent in our partnerships, and in our networks for change, improvement and innovation.

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[2]An explanation of the *CLIPS* grant project and the new career ladder for teachers and one for principals may be found in an unpublished document by Marino, Catelli, Ristea, and Godek, produced in 2013.

[3]For an explanation and examples of PDS action research see Tunks, 2011; Catelli, 2011; Catelli, Carlino, and Petraglia, 2014; and Catelli, Carlino, Petraglia, Godek, and Jackson, 2016. For a description of action research and collaborative inquiry in partnership settings see Catelli, 1995; and Catelli, Padovano, and Costello, 2000.

[4] For a complete explanation of the approach, theory and practice of holistic partnerships see Catelli, 1992, 1997, 2002, 2010a, 2011, and Catelli, Jackson, Marino and Perry, 2014.

[5]See Catelli, Carlino, Petraglia, Calascibetta, Jackson, and Marino (2017) for data generated by the 29 *CLIPS* classroom studies; and see Van Cott (2015) and Catelli, Marino, and Eschbach (2017) for the impacts and findings of the *CLIPS* grant-funded project.

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Using Clinical Teaching to Increase Student Achievement in High-Needs, Urban, Partnership Schools

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Abstract: In this research, a clinical teaching approach in a Professional Development School (PDS) partnership was employed to prepare student teachers in urban high-needs partnership schools. Though there are many qualitative studies that indicate an increase in student achievement in PDSs, few quantitative studies have been published. The clinical teaching used Teacher-Intern-Professor (TIP) groups with an Anchor Action Research (AAR) model to help evaluate the PDS teacher intern preparation efforts by measuring student achievement on pre- and post-assessment scores. Within the PDS partnership, a meta-analysis using random effects pre-post-control (PPC) model was used to summarize achievement differences between the TIP and comparison classes. The results showed that Hedges' *g* effect size between the classes is .326 in favor of TIP classes, which is a typical effect size for educational interventions. Thus, this study provides quantitative research to support K-12 student academic achievement through a PDS model.

KEYWORDS: professional development schools, PDS, clinical teaching, student achievement

NAPDS NINE ESSENTIALS ADDRESSED:

1. A comprehensive mission that is broader in its outreach and scope than the mission of any partner and that furthers the education profession and its responsibility to advance equity within schools and, by potential extension, the broader community;
4. A shared commitment to innovative and reflective practice by all participants;
5. Engagement in and public sharing of the results of deliberate investigations of practice by respective participants
6. Work by college/university faculty and P–12 faculty in formal roles across institutional settings;

Introduction

PDS partnership in this research was administered through Georgia State University and our HEA partners (Albany State University, Columbus State University, and Georgia Southern University) and served both urban and rural LEAs. Another valuable partner was Learning Forward (formerly National Commission on Teaching and America's Future, NCTAF), which has

provided training and resources for the student teachers and as many as 10 partner urban and rural LEAs. Within the partnership LEAs, the PDS partnership employs an Anchor Action Research (AAR) project used within clinical teaching in Teacher-Intern-Professor (TIP) groups (Curlette & Ogletree, 2011). This PDS approach, TIP, involves a university professor, mentor teacher, and intern working together on a unit of instruction. Specific components of the TIP group include meetings of the TIP group twice per month, a monthly training session for mentor teachers, understanding and implementation of an action research project focused on student achievement, and submission of a detailed report outlining the decision-making process, action research process, and results. The mentor teacher, professor, and intern (or student teacher) have experienced an informal relationship for many years. This TIP group formalizes the relationships among the members, has an AAR project for instructional focus, and brings a greater emphasis to action research in the classroom. The TIP group unites the leadership, specialization, and instructional experience of the mentor teacher and professor with the abilities of the intern to help prepare instruction and facilitate student achievement. The TIP group also meets the five essential characteristics of a professional learning community as defined by Vescio, Ross, and Adams (2008). The five essentials include developing shared values regarding students' abilities to learn, a clear focus on student learning, focused constructive dialogue among teachers regarding student learning and instruction, making teaching public, and enhanced collaboration between and among teachers. TIP groups engage in all those essentials through the AAR project. AAR is a form of action research that is anchored in three aspects:

1. The project is assessed using a pre- and post-assessment design.
2. The project addresses the teaching and learning process in which the teaching of the intern facilitates student learning in the classroom.
3. The project has a comparison condition (Curlette & Ogletree, 2011).

As a part of the TIP group, the intern will participate in the planning and delivering of a unit of instruction that uses a pretest and posttest assessment. In addition, a class, of same subject matter within the same treatment school, will be selected as a comparison class. The comparison class will have the same pre- and post-assessments as the treatment class. However, the treatment class will receive specially designed instruction based upon the planning of the TIP group. The innovative approach to instruction within the PDS can take many forms and is dependent on the expert guidance of the mentor teacher and professor and delivered by the intern. Qualitative studies have indicated the positive effects of PDS on student achievement. However, limited evidence of positive effects using quantitative methods within PDS has been published (Vescio, Ross, & Adams, 2008).

Although some AAR studies have been presented and a summary of the initial 10 studies was published (Curlette, Hendrick, Ogletree, & Benson, 2014), no comprehensive summary, across 25 AARs, has been presented. This report is designed to summarize the overall effectiveness of TIP with AAR to address a gap in the literature related to the evaluation of this approach. Objectives of this article are as follows: (a) to present the summative mean difference effect size of the pre- to post-assessment scores between AAR treatment and comparison classrooms and (b) to provide a discussion which informs clinical teaching practices based on those findings.

Perspective

A discussion of the benefits of clinical teaching can be found in Bohan and Many's (2011) book, *Clinical Teacher Education: Reflections from an Urban Professional Development School Network.* Another perspective in TIP with AAR is support for the action research approach which values participants' conducting research to improve teaching practices (Hendricks, 2009). The TIP group approach is consistent with Darling-Hammond and Richardson's (2009) position that asserts the importance of professional development in communities of practice.

A brief review of relevant studies establishes the context in which to interpret student achievement effect sizes results. In 2009, The Council of Chief State School Officers (CCSO) released a study in which a number of meta-analysis projects "analyzed evidence on the effects of mathematics and science teacher preparation and development initiatives on student achievement" (p. 3). The CCSO found a mean effect size of .21 between mathematics classes using a pre-and post-assessment model and a mean effect size of .05 between science classes using a pre-and post-assessment model. Many of the studies in this meta-analysis used norm referenced or criterion referenced tests to evaluate student performance. Therefore, the professional development provided to teachers may or may not be cogent to the assessment. "Studies that utilized student measures that are closer to the heart of what the professional development is intended to impact, do report larger effect sizes" (CCSO, 2009, p. 17). This addresses the 2012 NCME paper by Popham and Ryan that examines the "instructional sensitivity" of high-stakes tests. Most high-stakes tests are not sensitive to the precise pedagogy employed in the classroom; however, in some instances, educational decision makers may use students' high stakes test scores to evaluate teaching quality. Both the CCSO report and Popham and Ryan's article caution that, for the purposes of teacher evaluation, instructionally sensitive tests yield more applicable data.

Another recent meta-analysis, conducted by Yoon, Duncan, Lee, Scarloss, and Shapley (2007) for the Southwest Regional Education Laboratory, indicated that PDSs in the elementary grades are more effective than control classes at increasing student achievement. The reported effect size was .54, which is typical of elementary educational intervention studies. For this meta-analysis over 1300 studies were prescreened and nine studies met the What Works Clearinghouse (WWC) evidence standards. In examining other evidence, Sipe and Curlette (1996) conducted a large meta-synthesis of 103 meta-analyses related to education and student achievement that was consistent with Hattie (1992). The findings of both studies indicated effect sizes of .375 for the Sipe and Curlette meta-synthesis and .40 for Hattie. Even though common meta-analyses accounted for only about 10% of overlap between these two large meta-syntheses, the findings of the meta-syntheses were similar.

Process

The clinical teaching experience for the student teachers is extended to include yearlong placements in urban partnership schools. The student teacher is paired with the mentor teacher during the school's preplanning period. The student teacher to mentor partnership continues through the school's post planning period. During the fall, the intern in conjunction with the other members of the TIP group will choose an AAR unit. The TIP group will discuss and plan the theoretical instructional approach, activities, goals, and duration of the unit. Typically, the unit is 2 to 3 weeks in duration and the intern delivers all instruction during the AAR unit. The mentor

teacher provides daily formative feedback while the professor provides pedagogical consultation. The pretest and posttest are typically equivalent or similar in content and scope. The tests reference subject area goals set forth by the state curriculum, and are consistent with learning assessments that are familiar to the students. A comparison condition is selected in the same subject area, grade, performance level, and student socioeconomic level to help control potential confounding variables. The teacher of the similar unit for the comparison class will not alter the instructional plan for the comparison group, but he or she will teach in a manner that is consistent with effective pedagogy and quality instructional practices. The goal of the TIP group in this AAR unit is to be as effective at influencing student performance as the quality instruction of a veteran teacher in the comparison group. Therefore, the mean gain effect size of student performance in the AAR class would be similar to the mean gain effect size of student performance observed in the comparison class.

Typically, high-stakes tests are designed to assess whether a student understands a defined set of related concepts, which are deemed by experts as appropriate to predict an understanding of the overall subject area at an appropriate level of precision. High-stakes tests generally assess concepts that are considered central to the reasoning, performance, and understanding of the defined subject area. As such, the presentation of test items is limited to those that collectively indicate an overall grasp of the subject matter to minimize testing time and maximize the predictive nature of the test. While this may be an effective manner to assess the performance of the student, it is not designed to assess the quality of the teacher's pedagogy. This is one reason that unit pre- and posttests are used in AAR.

Using this model, each AAR with comparison would typically measure the achievement of between 20 and 60 students depending upon class size, consent, and assent rates. The relatively small sample size of a single AAR limits the statistical power and generalizability of the AAR; however, when multiple AAR studies are analyzed using meta-analysis techniques, the samples from a number of AAR studies are aggregated, providing increased statistical power and greater generalizability.

Methods and Data Sources

The goal for each of the AAR projects was to implement a quasi-experimental design: a pre- and post-assessment involving a treatment group and a comparison group. Some of the interns taught in rural school districts. In these settings, comparison classes were an issue because the teacher was in many cases the only subject matter teacher for a specific grade in the district. Though comparison classes could be assigned, the matching criteria could not be adequately applied to meet the WWC evidence standards. Also, some of the remaining interns were in Special Education assignments, where locating a matching comparison class was problematic and WWC evidence standards were not met because of the lack of a matching control group. From the initial group of AAR studies, we eliminated several studies because the research design did not meet the WWC evidence standards with reservations.

The remaining 31 studies were coded according to the following criteria: (a) the AAR project had a comparison condition, (b) the pre- and post-assessment used the same instrument in both AAR and comparison classrooms, (c) the instruments comprised objective questions that pertained to the targeted AAR unit, and (d) the comparison classroom was similar on student achievement level, gender balance, ethnic composition, and student socio-economic level. A quantitative and qualitative approach accessing AAR reports and data from LiveText was

augmented by conducting student and teacher interviews (Silverman, 2010). Of the 31 studies, three were eliminated because the number of participating students with signed consent and assent documents was low. In two studies, the instrumentation for the pretest and posttest was not equivalent, and in one study the focus for the instructional unit was not reflective of the assessment, or there was a lack of instructional sensitivity (Popham & Ryan, 2012). Therefore, 25 AAR quasi-experimental studies met the WWC evidence standards with reservations and were included in the meta-analysis with each study having a different intern in each AAR.

The method used to analyze the data was a random effects meta-analysis (Cooper, Hedges, & Valentine, 2009; Morris, 2008). In total, 817 individual students' pre- and post- assessment scores were included within the 25 AAR studies. Throughout the considered treatment and comparison classrooms, the number of students ranged from 12 to 52. Studies selected for this report have met the aforementioned criteria confirmed by LiveText, records of interviews, and other documentation.

Qualitative interviews with interns and mentor teachers as well as a collection of artifacts indicated that interns were focused on student engagement, relationship building, relevance of the lesson, effectively scaffolding learning strategies, and how to use action research in the classroom to improve student academic achievement. Qualitative data sources included 45- minute telephone interviews conducted by trained staff members of the Center for Evaluation and Research Services with NET-Q and CREST-Ed Mentor Teachers and Interns, document analysis of Mentor Teacher Monthly Training Sessions, document analysis of bi-weekly Teacher Intern Cohort Meetings, and analyses of class reflection papers submitted through Live Text by the interns. Interviews were transcribed and coded allowing for categories and themes to emerge.

Results

A comparison of the teaching effectiveness, in terms of student achievement, was analyzed by comparing the relative gains on the pre-to post-assessment scores of the AAR treatment class with the similar gains in scores made by the comparison class. The overall mean difference effect size for the random effects meta-analysis is .326 with confidence interval (.073 to .578) as seen at the bottom of Table 1. The effect size, .326, is a substantial and a statistically significant effect size in favor of the AAR outcome. This finding supports the qualitative research that PDSs have a positive influence on student achievement and is consistent with previous meta-syntheses examining student achievement. Our goal was to show that the PDS teacher preparation using the TIP model and AAR will produce beginning teachers who are as effective as or slightly more effective in facilitating student achievement than teachers in comparison classrooms in a unit of instruction.

Table 1. Statistics for Each AAR Study

Study	Hedge's g	Standard error	Variance	Lower limit	Upper limit	Z-value	p-value
AAR1	0.183	0.29	0.083	-0.38	0.75	0.633	0.527
AAR2	-0.542	0.35	0.120	-1.22	0.14	-1.562	0.118
AAR3	0.456	0.39	0.154	-0.31	1.23	1.161	0.246
AAR4	0.449	0.27	0.073	-0.08	0.98	1.661	0.097
AAR5	0.700	0.30	0.088	0.12	1.28	2.355	0.019
AAR6	0.468	0.30	0.089	-0.12	1.05	1.569	0.117
AAR7	0.373	0.35	0.123	-0.31	1.06	1.066	0.286
AAR8	0.869	0.32	0.100	0.25	1.49	2.754	0.006
AAR9	0.457	0.32	0.104	-0.18	1.09	1.413	0.158
AAR10	0.248	0.28	0.076	-0.29	0.79	0.897	0.370
AAR11	0.502	0.47	0.225	-0.43	1.43	1.059	0.290
AAR12	1.108	0.39	0.150	0.35	1.87	2.862	0.004
AAR13	1.697	0.60	0.359	0.52	2.87	2.833	0.005
AAR14	0.211	0.39	0.149	-0.55	0.97	0.548	0.584
AAR15	-0.553	0.42	0.175	-1.37	0.27	-1.320	0.187
AAR16	0.913	0.36	0.131	0.20	1.62	2.523	0.012
AAR17	-0.582	0.55	0.306	-1.67	0.50	-1.051	0.293
AAR18	-0.538	0.39	0.156	-1.31	0.23	-1.364	0.172
AAR19	1.110	0.31	0.097	0.50	1.72	3.557	0.000
AAR20	-1.852	0.45	0.199	-2.73	-0.98	-4.155	0.000
AAR21	0.024	0.48	0.232	-0.92	0.97	0.050	0.960
AAR22	0.164	0.32	0.102	-0.46	0.79	0.514	0.607
AAR23	-0.001	0.25	0.062	-0.49	0.49	-0.003	0.998
AAR24	0.577	0.48	0.227	-0.36	1.51	1.211	0.226
AAR25	1.528	0.40	0.158	0.75	2.31	3.849	0.000
Random model	0.326	0.13	0.017	0.07	0.58	2.523	0.012

A forest plot (Figure 1) illustrates the weight and mean gain comparison of the 25 studies within the random effects meta-analysis. As shown within the forest plot, there was a statistically significant negative change in only one (AAR 20) of the 25 AAR treatment and comparison class studies and a statistically significant positive change in seven of the studies (AAR 5, 8, 12, 13, 16, 19, 25). Further examination of each of the 25 AAR studies show a majority indicating a positive main effect between pretest and posttest, averaging a gain of 31 percentage points for the treatment group and 26 percentage points for the comparison group. In most cases, the percentage gains from pretest mean to posttest mean were similar for both groups. In the studies with negative effect sizes, typically the pretest mean for the comparison group was more than 10 percentage points lower than the treatment pretest mean. Though, for those studies, the posttest means were about the same, greater growth was indicated by the comparison group leading to a negative effect size. The same is not the case when examining the studies with positive effect sizes. In those studies, the majority of the cases show that the treatment posttest mean is an average of 5 percentage points higher than the comparison posttest mean, which typically results in a positive effect size. The

majority of studies demonstrate a main effect increase in the treatment group. The comparison group main effect shows a matched counterfactual to reference the amount of increase in student performance.

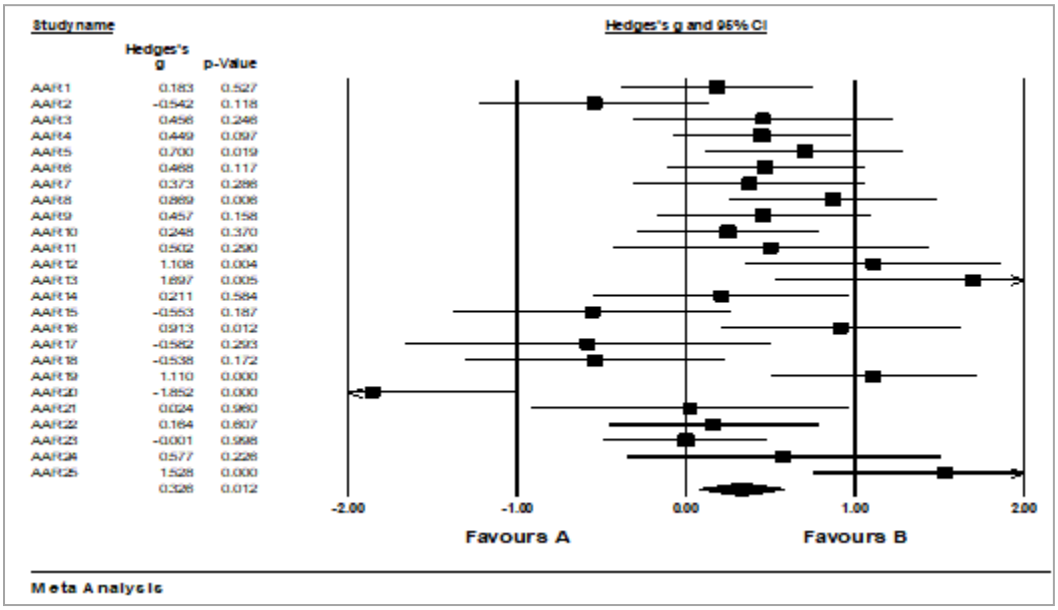

Figure 1. Forest plot showing weight and mean gain.

The importance of a matched counterfactual is noted in AAR 7, in which the overall change for the treatment, from pretest to posttest mean, was negative. This would seem to indicate that the intern had not influenced a gain in student performance. The counterfactual change in the comparison group was also negative, which may indicate an issue with the topic or group. A closer inspection of artifacts relating to AAR 7 shows the students in both the treatment and comparison classes were socially promoted during the previous two times they had attempted this specific course and were being given a remedial curriculum during the AAR 7 that assumed the students had foundational mathematics skills (e.g. multiplication, and division). Many of the students were not successful in the course, just as they had not been successful in that course for the previous two years. An analysis of the change in pretest and posttest scores between treatment and comparison groups resulted in a positive effect size (0.384) and a non-significant result in the individual study due to the low sample size. However, the importance of a matched comparison group is illustrated in this specific study. The random effects meta-analysis assumes the observed estimates of the AAR treatment effect can vary across studies because of different teaching strategies used within each AAR in each study as well as some variability within each class. Such heterogeneity in treatment effects is caused by uncontrolled differences in the target classes, interventions received (teaching strategy), length of the unit, and other factors (Riley, Higgins, & Deeks, 2011).

The establishment, training and maintenance of TIP groups with AAR was important to the success of the intern program. Initial training was provided through a summer research class dedicated to the intern cohort. In this class, the TIP model was presented and interwoven throughout the course classwork with the data collection. The unique research cohort was given an "in progress" using the fall semester to implement the AAR in their intern classrooms. Grades

were given to the interns upon the successful completion of the AAR project. While the interns were being trained through the research cohort class, mentor teachers were also provided with mentor training that included monthly meetings with the university mentor trainers. Mentors were provided with Mentor Modules produced to support mentors regardless of their use of AAR.

Each TIP group was given latitude in choosing their instructional area of focus, which depended largely on the unique needs of the area of study and placement of the intern. Once the instructional focus was determined, the TIP groups focused on understanding data and their varied uses such as for differentiation of instruction, measuring student engagement, and teacher professional identity. The TIP groups also included discussions around becoming better consumers of research and the use of technology for collecting, cleaning, analyzing, and reporting findings for dissemination purposes. One intern stated "The data I collected helped me to improve my lessons, understand how students learn and change delivery to respond adequately to the needs of my students. I have more insight into what I am doing [in the classroom] because of my AAR experience." A second intern saw the TIP/AAR experience as helping to establish her professional identity, "I grew enormously. I now view myself as a professional educator. I feel more confident in my ability to shift mid lesson if needed."

Mentor teachers cited several ways in which their participation in the mentor training and the TIP/AAR experience has positively impacted their self-efficacy when mentoring interns. Mentor teachers cited increased levels of confidence in their reflexive ability when working with interns from different backgrounds, openness to new ideas around models of management and instruction techniques, as well as being better able to give feedback in supportive ways. Using AAR provided a space for mentor teachers to practice these confidence-building techniques. One mentor teacher stated, "I feel that is it important for new teachers to see and use Action Research. New teachers need to be able to try new strategies and then take the data to see what did or did not work. Action Research is a practice." A second mentor teacher stated, "I see the difference being made in student achievement. It is beneficial to the intern in that it helps them to compare where students are and where they need to be…you can see the growth."

The formative evaluation feedback was valuable to a majority of the interns as the lesson plans were flexible and could be modified to promote student learning in several ways. One modification, duration of the lesson, was somewhat fixed by the class schedule and the curricular pacing. Approximately 60% of those interviewed commented that more time for the teaching process would help the interns by allowing for remediation of previously taught skills and concepts that were presented to students in previous years, but not mastered by many students. The majority of learning at the middle and high school levels is cumulative, that is simple concepts and skills are needed to solve more complex problems and those simpler concepts are combined and more complex algorithms are formed from these building blocks in learning. Students who are missing critical understanding may be missing a building block in the learning process that requires some effective remediation to reach a more complex understanding of the subject.

Another observation by some of the interns concerns the self-confidence of the learner. Some of the interns indicated an additional need to address the self-confidence of the learner. As described in the reflections and observations of the interns, the students would seem to grasp the concept and successfully apply the problem-solving steps during the lesson, only to fail to perform successfully on a formative assessment of the same concept. This phenomenon may be a reason that some untrained adults attribute this problem to the urban environment. However, to an intern trained in urban teaching at GSU, this was an issue that could be addressed. The interns who cited

low self-confidence chose pedagogical modifications to bolster confidence in the students. For one class, the intern used argumentation, in which the students had to defend their positions about solving problems. In other classes, the interns used graphic organizers to firmly describe the problem-solving steps or creating a project, which ensured the students internalize the concepts within the lesson. These interns demonstrated teaching strategies that showed that every student could learn because, in part, to the yearlong placement and the excellent guidance in the urban partnership districts.

Conclusions and Significance

The goal of the AAR program is to inform the PDS process of utilizing the TIP groups in preparing beginning teachers who are as effective as or more effective at facilitating student achievement as comparison teachers. The statistically significant .326 effect size produced by the random effects meta-analysis results of these 25 studies closely relates to the effect sizes (.375 and .40) referenced by large meta-syntheses conducted during the past two decades related to educational interventions and student achievement (Sipe & Curlette, 1996; Hattie, 1992). This is noteworthy because the typical intern in the TIP model does not just tie the comparison group teacher in student achievement but outperforms the comparison group teacher in the unit of instruction evaluated. The findings of the PDS partnership using clinical teaching through TIP with AAR compared to other overall effect sizes for educational interventions show an effect size (i.e., .326) which is typical in the published literature, thus, providing evidence for a PDS approach for improving student achievement.

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Simultaneous Inquiry:
Renewing Partnerships and People in Professional Development Schools

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Abstract: Simultaneous inquiry draws on the traditions of teacher inquiry and simultaneous renewal (Sirotnik & Goodlad, 1988) concepts at the heart of vibrant school-university partnerships. In this case in point, we identify the key components of our simultaneous inquiry model through the development of a Core Practice Study Group. We describe how simultaneously asking and answering shared questions has renewed and enriched our work with teacher candidates across both school and university classrooms. Simultaneous inquiry can help teacher candidates, participating K-12 teachers, and teacher educators develop new practices, commitments, methods of fostering each other's growth, and desire to engage in more simultaneous inquiry.

KEYWORDS: simultaneous inquiry, teacher education, teacher inquiry

NAPDS NINE 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;

5. Engagement in and public sharing of the results of deliberate investigations of practice by respective participants;
6. An articulation agreement developed by the respective participants delineating the roles and responsibilities of all involved;
7. A structure that allows all participants a forum for ongoing governance, reflection, and collaboration;

Introduction

"Participating in the Core Practice Study Group was a way for me to examine and renew my own teaching practices while simultaneously discussing and planning core practices with my teacher candidate. Having the chance to focus on my own use of the core practices and to grow along with my teacher candidate is so beneficial for my teaching, and especially for the students in my classroom. It also sets a good example for teacher candidates to see that teachers should be lifelong learners who need to continually refine their craft as well."

-Annie, 2nd grade teacher

"I'm a harried faculty member who doesn't seek out readings or experience that challenge my sense of good teaching practice. How awesome it was to have new input that broke through my taken-for-granted assumptions. I'm so sold on this work that my next sabbatical project will let me engage with more teachers, talk about practice, and try some of these practices myself. The language and insights we generated—and some reading—also show up as preservice teachers discuss, view, and try out discussion facilitation in my methods course."

-Tom, social studies methods professor

K-12 teachers and university-based teacher educators, alike, face increasing pressure to improve the quality of teaching in the nation's schools and raise student achievement. In this case in point, we describe how simultaneous inquiry can begin to address these pressures. Simultaneous inquiry involves university-based teacher educators working together with their K-12 teaching colleagues to critically investigate and enrich the learning-to-teach opportunities they provide teacher candidates. In doing so, they not only assist teacher candidates in building a robust teaching practice, but they also improve their own teaching. Simultaneous inquiry thus draws on the traditions of teacher inquiry and simultaneous renewal (Sirotnik & Goodlad, 1988) at the heart of vibrant school-university partnerships. In this case in point, we identify the key components of our simultaneous inquiry model and describe how engaging in this model has renewed and enriched our work with teacher candidates across our school and university classrooms.

Background

We developed our model of simultaneous inquiry through our efforts to redesign our program on a practice-based teacher education (PBTE) model. PBTE calls on teacher educators to refocus their programs onto high-leverage or core teaching practices that promote K-12 student learning (Ball & Forzani, 2009; Grossman, Hammerness & McDonald, 2009; Lampert, 2010). Following a PBTE model, we worked together to identify 19 core teaching practices, ranging from making content explicit, to establishing and reinforcing consistent routines and positively stated behavioral expectations. The core practices have guided our creation of new university courses

and our re-organization of clinical placements. Importantly, teachers and administrators in our K-12 partner schools worked together with our university-faculty throughout the redesign, reading the same research and coming together to share, critique and co-create new ways of working with teacher candidates and with each other. The Core Practice Study Group arose out of this work and became the site of our simultaneous inquiry.

Core Practice Study Group Model

We created the Core Practice Study Group in the second year of our program redesign. The Study Group brought together four university teacher educators, three of our partner K-12 teachers, and four teacher candidates to explore how we could develop new ways of preparing teacher candidates to facilitate whole class discussions, our core practice #14. The group met several times over four months and organized our work around three activities: shared readings, video analysis and group discussion (Figure 1). The meetings took place in the teachers' classrooms, taking turns in all three of the schools, representing both urban and suburban sites. The meetings occurred on Friday afternoons, and we also had dinner and dessert together.

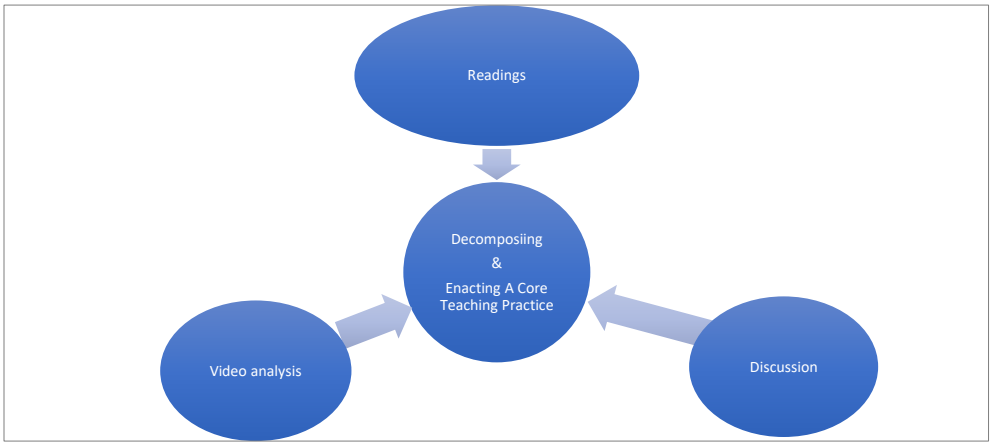

Figure 1. Elements of the Core Practice Study Group Model

We focused the first two meetings on reading literature and watching externally made videos to decompose the practice of discussion. Decomposition is the process of breaking down a complex teaching practice into its smaller, component parts (Grossman et al., 2009). Decomposition helps teacher educators better scaffold teacher candidates' learning as it allows both to focus their efforts on one component at a time. Through our joint reading, we determined that effective whole class discussions require teachers to: establish clear objectives; construct open-ended questions; take up student comments through re-voicing; and facilitate student-to-student talk. June, Annie and Colleen, the teachers, then worked with their teacher candidates to plan for and enact discussions in their elementary classrooms. All of us, the teachers and teacher candidates, both videotaped the discussions they facilitated. We then devoted our meetings to examining these videotapes, reviewing other discussion artifacts, and investigating ways in which the discussions did or did not support student engagement and learning.

At the same time that the teachers and teacher candidates were building their discussion practice in their elementary classes, the university-based teacher educators, René, Robin, Dorothea

and Tom, were revising discussion practices in their university classes. René and Robin attended closely to discussion in their university seminar classes. Dorothea was also working to embed a focus on facilitating whole class discussion in the creation of a new multicultural education course. In the sections below, we briefly describe this work to illustrate how simultaneous inquiry can support the renewal of teaching across school and university classrooms.

Simultaneous Inquiry Renewed Participating Teachers

> *"The Core Practice Study Group changed the way I conduct discussion with my students. The rich discussions of our group, in addition to the articles we read, allowed me to take a closer look at my own practice of discussion in my classroom. I realized that I was using less student talk than I thought I was, and I began to incorporate more authentic discussion opportunities throughout the day. The shift in my students and their active participation was so powerful. Many more students were engaged and the discussions were much more involved."*
>
> *– Annie*

Simultaneous inquiry spurred new practices, energy, and methods of supporting teacher candidates among participating K-12 teachers. The Core Practice Study Group enabled us to build tools, take on new roles, and try out pedagogies because we had new insights and commitments developed through the group.

Annie, a 2nd grade classroom teacher in a suburban PK-5th elementary school who worked with a teacher candidate, noted subtle, but powerful shifts in her lesson planning to allow for more student participation. For example, one lesson was initially designed for the teacher to ask the questions to the whole class about historical photographs, thus eliciting one response at a time from students. After the Core Practice Study Group, Annie and her student teacher decided to pose the open-ended questions for students to discuss in small groups. Many more students were able to participate since they did not have to wait to be called on to share their thoughts resulting in much more student talk and much less teacher talk. According to Fisher and Frey (2014), "It matters who's talking in class because the amount of talk that students do is correlated with their achievement" (p. 19). Almost all of the students were engaged in the discussion, which led to many more keen observations about the historical photographs.

> *"Collaborating with this cross-section of educators on the topic of facilitating discussions had a direct and immediate impact on the instructional practices of myself and my intern. We consciously planned to talk less and facilitate more. The incorporation of student- generated questions significantly raised the level of discussion and comprehension of the topic. All students experienced validation of their thoughts and ideas by reporting that they "had a voice" in classroom discussions."*
>
> *–June*

June, the Dean of Students of an elementary school, worked with a Master's level intern in an urban PK-8 neighborhood elementary/middle school. June and her intern applied the work of the Core Practice Study Group to how they approached teaching a group of middle school boys who were exhibiting low academic achievement and behavioral concerns. June and her intern

realized that lecturing or 'talking at' the students would be ineffective and allowing the boys to talk with one another had a much better chance at being an effective strategy. According to Wasserman (2010), when teachers talk too much or tell students what to think, they reduce the opportunities for students to exercise their own brainpower. June and her intern knew it was essential to avoid these pitfalls and focus on creating opportunities for deeper discussion.

By modeling active listening, responding to one another's statements, and utilizing several discussion protocols, the hope was to increase participation and active engagement. However, having studied and discussed ways to effectively facilitate discussion, June and her intern predicted that the highest level of discussion would be produced from self-generated questions. Therefore, they intentionally planned to provide students with brainstorming time to self-generate questions at the beginning of the session and discuss these topics with each other. This practice shifted the control of the classroom discussion from the teachers to the students, a risky endeavor grounded in the belief that the value of the end product outweighed the chance of off topic discussions and a lack of teacher control. Student exit tickets seemed to suggest that they had developed a deeper comprehension of the content through the discussion practices. All students reported that they "had a voice" in the classroom and believed that they had learned from each other's contributions.

> *"The Core Practice Study Group was an invaluable experience that completely changed my style as an educator. Through this study, I had a shift in mindset about the value of student discourse. I learned that student discussion is necessary to increase student learning and a valuable tool to help teachers to release more responsibility to their students and make their classrooms largely student-led."*
>
> *– Colleen*

Colleen, a 4th grade teacher in an urban PK-8 elementary school worked with one teacher candidate. The Core Practice Study Group led them to purposefully create opportunities for student discourse during math lessons, the subject in which students had the least confidence and were the least participatory. Colleen reports it was difficult, at first, to determine how to effectively increase student discussion during math. The Core Practice Study Group helped her feel more confident with experimenting because of the support and feedback she received in study meetings as well as the input of the teacher candidate, who helped her facilitate changes and shifts in practice from the beginning. As the year progressed, Colleen found incorporating student discussion into her lessons became easier, more natural and extended discussion strategies into all areas of her teaching.

Colleen cites some of the positive student outcomes resulting from her experience in the Core Practices Study Group and the shifts in her planning. Students appeared to become more confident and willing to share their ideas or collaborate with others. Through the development of discussion techniques, students responded more appropriately to peers and they began using more academic vocabulary in their daily language because they were using those words more frequently within lessons. In addition, students developed more independence with their learning and asked for support less frequently. Students were comfortable consulting with peers when they came across a problem, and had increased confidence in their classmates' abilities.

Jessica, who worked with Annie, considered a variety of topics through her participation in the group. She felt newer teachers may fear facilitating student led discussions as a result of not having well established classroom management, especially in areas like math where discussion is not always promoted. She noted "one of the articles discussed getting out of the students' way,

and really stepping back and allowing them to take it in the direction they want to go in. I think often times we want to control everything." Jessica concluded by saying she is hoping to work with other professionals who are equally interested in this type of inquiry. In fact, she was able to see how she might be the person who takes a lead role on this when she stated, "I'm hoping to be that person, in whatever school I end up in, that's willing to have these conversations and ask these types of questions of other professionals I'm working with."

The Impact of Simultaneous Inquiry on Role Changes for Participating Teacher Education Instructors

Those of us who are teacher educators have commitments to developing partnerships, doing research, and preparing future teachers that often preclude engaging in professional development about best practices for K-12 students. For us, however, the benefits of participating in this group went beyond making us better facilitators of discussion; we also acquired new language, insights, and experience that have improved how we prepare future teachers. We also realized that we would have to risk changing the roles we traditionally play in facilitating discussion among pre-service teachers. Generally, we initiate the discussion and then continue to participate by echoing student responses and making comments to shape the discussion. Our simultaneous inquiry participation caused us to rethink our roles and explore the possibility of stepping back to allow the pre-service teachers more space and opportunity to shape the discussion.

René, a university professor responsible for teaching the first seminar course to newly admitted juniors, changed several weeks of her course outline to reflect what she learned during the Core Practice Study Group. Participating in the group helped her realize some of the key issues seasoned teachers and teacher candidates struggle with when facilitating discussion, as indicated by the teachers above. It left her wondering how she could renew her course to allow teacher candidates more time to practice facilitating discussion *in* class with peers as well as in their clinic placements. Initially designed as an in-class activity, students would get examples of critical incidents in schools, work in small groups and report out possible solutions. When the assignment was modified, it required small groups of students to work together on a critical incident of their choice. The small groups were asked to construct an activity for their peers, in a mini-teach format. The one requirement of the activity they designed was that it had to include facilitating a discussion. This activity took two class periods instead of one, but the result was rich student-led discussions, creative pedagogical approaches, and collaboration among students. René deliberately reserved commentary for a feedback form she filled out while the students were facilitating the class. René describes the Core Practice Study Group as, "creating a space where everyone was curious and open to better understanding a complex core practice more deeply. Reading, watching and discussing real problems of practice with teachers, teacher candidates and university colleagues was not only enlightening, it was fun and inspired me to be a better teacher educator".

Robin is another university professor responsible for teaching the first seminar course to newly admitted juniors. Typically, the seminar leader provides structure, order, and consistency to the various classroom discussions and encourages students to probe the intricacies of professional issues together. The seminar is divided into topical sessions with a focus on the critical issues mentioned by Robin and other experiences teacher candidates face in their clinic placements. Additionally, this fall seminar focuses on the influence of democracy on schools and classrooms, both on a macro and micro level (policy and practices).

One of the lessons in which juniors participate includes viewing a variety of socially and politically charged visual images. As they view the images, students are given questions to consider and respond to in writing: What story does the image tell? What are other different/possible interpretations of the image? What does the image say or not say about collective or individual democratic conditions? Once students have had an opportunity to generate their responses to the questions, they are placed in small groups to begin a discussion. The goal of the discussion is for the group to come to some consensus on the meaning and/or impact of the viewed images.

In years past, Robin would ask each group to report out and she would make comments and then move to the next group. However, after participating in the shared inquiry group regarding the core practice of discussion, she decided that this year, she would give the students responsibility for running a whole-class discussion. Because the students were familiar with Soder's (2001) democratic conditions, they were able to agree that "respect for civil discourse" would be the only ground rule. As the discussion ensued, students had lively disagreements about the meaning of some of the images. Some students went online to establish a historical context for the images, while others referenced their own personal experiences with oppression.

Meanwhile, Robin found that her role was to actively listen and to suspend judgment and closure so that the discussion could be fully shaped by the students and not by her own agenda for what she thought was important for them to learn from this experience. In the end, the discussion was rich and life-giving, with students truly owning the meaning behind the visual images. It did not matter that some of their interpretations were not "accurate," what mattered more is that they engaged with each other regarding some very sensitive material and they were able to draw their own conclusions and, in some instances, agree to disagree. When evaluating the experience, the students felt proud of their ability to respectfully engage in civil discourse, which was a valuable outcome of the lesson – an outcome that would not have been promoted in the original "reporting out" model.

Simultaneous Inquiry and the Creation of New Teacher Education Tools

In addition to helping us take on new roles facilitating discussions in our university classrooms, participating in the Core Study Group helped us create new tools to support our teacher candidate learning. One goal of our program redesign was to provide our teacher candidates with more robust opportunities to build their knowledge, commitment and skill in working effectively with diverse learners. One way we have addressed this goal is through creating a new course at the beginning of our program, *EDCI3100: Multicultural Education, Equity and Social Justice*. Dorothea led the group of faculty and graduate students who designed the course. Her involvement in the Core Practice Study Group directly informed this work. She used the work that the Group had done decomposing discussion to create a major course assignment that required students to facilitate whole class discussions about key concepts and readings.

We launched the new course in fall semester 2016. Course instructors met regularly to share resources and reflect on our teaching and our students' learning. One of the resources instructors created was a discussion review sheet designed to help students analyze instructors' discussion facilitation, identify moves instructors made to spark and sustain discussion, and consider whether and why the moves were effective. Instructors also developed a set of prompts that students, working with course instructors, addressed to prepare for their own discussion facilitation. The prompts aligned with the components of discussions identified by the Core

Practice Study Group and asked students to identify objectives and plan for questions and moves they would use to promote student engagement and student-to-student responses. The discussion assignment provided teacher candidates with opportunities to develop an initial understanding of and emergent skill in facilitating discussions. It also prompted instructors to improve their own teaching. As Dorothea noted, "As we helped our students plan for their discussions, provided them feedback, and opened our own discussion practice to their critique, we planned more deliberately and reflected more deeply on our own discussion facilitation."

Future Inquiry

Our participation in the Study Group has not only helped us enrich our practices, it has also spurred us to engage in further simultaneous inquiry. We have restructured our partnership agreements to create a new group of partner schools that we now call Collaborative Inquiry Schools (Parker, Parsons, Groth, & Brown, 2016). These schools have agreed to work with a critical mass of teacher candidates at all stages of our program and to engage with them and with university faculty in inquiry projects aimed at exploring how we can best support teacher candidates building their knowledge and skill enacting our core teaching practices. The Collaborative Inquiry Schools will allow us to bring the work of the Core Practice Study Group to scale. They will be sites on which we will be able to generate new tools, pedagogical practices and new models of working together across our whole program. One of the three schools represented in our Simultaneous Inquiry Group has agreed to be a Collaborative Inquiry School for the next 2-3 years.

Conclusion

Our experience of renewing our commitment to improve our own and our teacher candidates' teaching practices convinces us that there is much more potential of simultaneous inquiry to support our learning about other core practices. Through creating genuine learning communities that unite teacher educators and teachers in partnering schools, simultaneous renewal can be fully realized.

Preparing effective and ethical teachers who can support all of their students' learning requires that teacher educators and K-12 teachers work in new ways not only with teacher candidates but also with each other. Simultaneous inquiry provides a model for doing this work in ways that raises the quality of teaching across our school and university classrooms and helps us build the partnerships necessary to sustain this work.

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Genius Hour as Teacher Inquiry: Professional Learning for Teacher Candidates and Teachers

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Abstract: Adapted from K-12 classrooms, Genius Hour serves as a framework for teacher inquiry in a professional development school. Through Genius Hour, teacher candidates and practicing teachers in a PDS identify questions grounded in their passions for teaching and learning, explore relevant resources, gather data, reflect on what they learn, offer recommendations, develop resources, and pose new questions. They share their learning with authentic audiences through blogs and a Genius Hour Fair on-site at the PDS. Our case in point highlights the emerging impact of Genius Hour as a framework for teacher inquiry and a form of effective and reciprocal professional learning in the PDS.

KEYWORDS: teacher inquiry, professional development school, teacher education, professional learning, professional development

NAPDS NINE ESSENTIALS ADDRESSED:
3. Ongoing and reciprocal professional development for all participants guided by need.
4. A shared commitment to innovative and reflective practice by all participants.

Introduction

Professional learning is a critical component of a teacher's professional life (National Commission on Teaching & America's Future, 2016). Opportunities to deepen content knowledge, learn about research-based instructional strategies, experiment with technology to enhance teaching and learning, and explore effective ways to engage families are examples of the types of professional learning that contribute to the development of teachers over the course of their careers. Traditionally, professional learning experiences have been provided through a one-time, one-directional method in which content is delivered to participants, with little to no follow-up with the practitioners who are expected to implement the newly acquired content, skill, or tool (Worsham, 2015). Additionally, professional learning opportunities are oftentimes determined by school, district, or state administrators, with little regard for what teachers say they need or want to learn (Calvert, 2016). To be effective, professional learning experiences should be "ongoing,

long-term," (Zepeda, 2012, p. 8), and embedded in the daily work of teachers (Fullan, 2007; Learning Forward, 2011; National Commission on Teaching & America's Future, 2016).

Cochran-Smith and Lytle (2009) define teacher inquiry as the systematic, intentional study by educators of their own practice. Teacher inquiry as a form of professional learning has the potential to meet the expectations for effective professional learning in that it provides for teacher ownership of learning, encourages teacher reflection, is rooted in the daily problems of teacher practice, and can lead to meaningful change in teaching and learning in the classroom (Dana & Yendol-Hoppey, 2014).

Research on teacher inquiry in the context of a professional development school (PDS) highlights benefits for teacher candidates and teachers (see Crocco, Faithfull, & Schwartz, 2003; Dana, Silva, & Snow-Gerono, 2002; Mule 2006). Teacher inquiry in the PDS positions educators as change agents (see Mule, 2006; Price & Valli, 2005) in keeping with "inquiry as stance" (Cochran-Smith, 2013; Cochran-Smith & Lytle, 1999, 2009). As described by Cochran-Smith, an inquiry stance "is a theory of action that positions the collective intellectual capacity of teachers and other practitioners at the center of the transformation of teaching and learning in schools" (2013, p. xii). In reporting on her study of teacher candidates engaged in inquiry in a professional development school, Mule (2006) notes, "The concept of preservice teachers as inquirers allows for the development of future teachers needed for the renewal of the cultures of teaching and education that is the central aim of PDSs" (p. 216). With its focus on professional learning and reflective practice, teacher inquiry relates to two of the National Association for Professional Development Schools (NAPDS) essentials for PDS work:

> 3. Ongoing and reciprocal professional development for all participants guided by need.
> 4. A shared commitment to innovative and reflective practice by all participants. (NAPDS, 2008, p. 5)

In this article, we describe how we adapted and used Genius Hour (see Juliani, 2015; Maiers, 2010; Pink, 2009) as a framework for teacher inquiry in a professional development school. Through Genius Hour, teacher candidates and practicing teachers in a PDS pursue passion projects related to middle grades education and engage in reciprocal and effective professional learning.

Genius Hour

Genius Hour is grounded in the 20%-time idea used at Google, 3M, and many other companies and organizations, including National Public Radio, Flickr, and the *Huffington Post* (Tate, 2012). Employees use 20% of their time each week to pursue their passions, providing dedicated time to explore, create, and incubate innovations. For example, at 3M, 20% time resulted in the creation of Post-It notes, and at Google, 20%-time yielded innovations like Gmail, Google Earth, and Google Sky (Juliani, 2015).

Daniel Pink, author of *Drive: The Surprising Truth About What Motivates Us* (2009), and Angela Maiers, an educator who focuses on student-centered learning and author of *The Passion-Driven Classroom: A Framework for Teaching and Learning* (2010), were among the first to talk about using the idea of 20% time in K-12 classrooms and calling it "Genius Hour." For Genius Hour in the K-12 classroom, students develop their own inquiry questions about whatever they want to explore and take time each week to work on new ideas or master new skills or both. In the process, students demonstrate their genius and share it with authentic audiences through blogs, videos, community events, etc.

Going beyond the connection to 20% time in the work place, Genius Hour also reflects the progressive education approaches of Maria Montessori and John Dewey (Juliani, 2015). *The Montessori Method* (1912), the definitive source for Montessori's ideas about children and learning, centers on tapping into children's natural curiosity as the engine to drive learning. In *Experience and Education* (1938; 1998), Dewey offers a concise treatise on his educational philosophy that emphasizes the freedom to explore purposeful learning sparked by desire.

A lively and far-flung community of K-12 educators use Genius Hour in their classrooms, sharing their experiences and ideas on web sites, blogs, and Twitter chats (Krebs & Zvi, 2016). Genius Hour in the classroom supports learning, creativity, and innovation in ways that both Montessori and Dewey likely would find heartening and familiar:

- Individualized learning based on interests;
- Hands-on learning opportunities;
- Freedom to explore;
- Don't interrupt a work cycle or "flow"; and
- Work at your own pace. (Juliani, 2015, p. 16)

In our work, we have adapted Genius Hour from the K-12 classroom, using it as a framework for teacher inquiry in the PDS. Teacher candidates and practicing teachers pursue passion projects related to young adolescents and middle grades education. They explore resources, gather evidence related to their questions, reflect on what they learn, offer recommendations for other educators, (in some cases) develop tools, and pose new questions. They share their learning from Genius Hour with authentic audiences through blogs, professional learning events on-site at the PDS, and presentations to other educators at local and national workshops and conferences.

Intrinsic motivation is integral to both teacher inquiry and Genius Hour. In describing the fundamentals of motivation, Pink notes:

> Type I [intrinsically motivated] behavior depends on three nutrients: autonomy, mastery, and purpose. Type I behavior is self-directed. It is devoted to becoming better and better at something that matters. And it connects that quest for excellence to a larger purpose. (2009, pp. 78-79)

Autonomy is central to teacher inquiry, a self-directed professional learning practice that emphasizes teacher "ownership of …classroom-based investigation" to "improve classroom practice" rather than advance a university researcher's field of study (Dana & Yendol-Hoppey, 2014, p. 9). Genius Hour as teacher inquiry embeds autonomy into professional learning. Because it starts with personal passions related to middle grades education, Genius Hour seems to make the entry into teacher inquiry non-threatening for teacher candidates and practicing teachers alike.

Through teacher inquiry, educators seek mastery through a cyclical process of thought and action, reflection and inquiry focused on what Cochran-Smith and Lytle call "knowledge *in* practice" (1999, p. 262). As Casciola explains, "Knowledge *in* practice is the knowledge developed as teachers learn how to respond to the everyday happenings in the classroom…. [Teachers] construct knowledge *in* practice when they try out an idea within their classrooms" (2016, p. 54). Genius Hour is not a term paper requiring grudging research into irrelevant topics or tedious data collection and reporting in response to a mandate. Instead, educators involved in Genius Hour as teacher inquiry appear motivated to read, listen, ask, observe, create, innovate, reflect, share, and ask new questions.

With ongoing, iterative cycles of inquiry motivated by the purposes and passions that brought them to the classroom, Genius Hour supports educators in the PDS to serve as leaders

and standard bearers for transforming schooling (Cochran-Smith & Lytle, 2009; Price & Valli, 2005). Inquiry focused on problems of practice has the potential to make a positive impact on the quality of school experiences for students and educators, as well as inform our understanding of the teaching and learning processes that are at the heart of all educational endeavors (Cochran-Smith, 2013).

With Genius Hour, we aim to support practitioners and teacher candidates in navigating inquiry processes and improving their classroom practices, while simultaneously strengthening our PDS partnership through reciprocal learning. We will feature three examples depicting how our PDS partnership used Genius Hour as a framework to encourage and support teacher inquiry.

Background: School/University Partnership

The Southern University (SU, pseudonym) has partnered with a nearby school district to form a Professional Development School District (PDSD) partnership that relies on "developing trusting relationships and considering complex contexts" (Andrews & Thompson, 2016, p. 5). Genius Hour builds on those trusting relationships and accounts for complex contexts by engaging middle grades education teacher candidates and practicing teachers in a local middle school in using their passions to drive inquiry that will enhance teaching and learning.

The PDSD partnership between SU and a school district officially launched in 2007 as the result of meaningful collaboration between the two institutions going back several decades. Every school in the district is involved in the PDSD at varying levels of intensity (Andrews & Thompson, 2016). Small City Middle School (SCMS, a pseudonym) is heavily involved in the partnership work with co-Professors-in-Residence (PIR) onsite, university teacher candidates placed in classrooms for field experiences, on-site university courses, and professional learning opportunities connected to the PDSD. Professors-in-residence, or PIRs, are university faculty who devote a percentage of their budgeted university contract time to working with and in a PDS for the academic year.

In 2011, Gayle Andrews and Kathy Thompson became the first Co-PIRs in the PDSD. As faculty members in the SU middle grades education program, they developed and taught undergraduate and graduate courses together. Because they valued their collaborative approach to teaching and learning and believed that it enhanced the educational experiences of their teacher candidates, they proposed a Co-PIR model that would allow them to share in the duties, responsibilities, and benefits of the PDS work at SCMS.

Southern University's middle grades education program prepares teachers for grades 4-8. Middle grades teacher candidates—both bachelor's (BSED) and masters of arts in teaching (MAT) students—enter this two-year program in cohorts. The teacher candidates choose any combination of two content areas from language arts, mathematics, science, and social studies. Every other cohort is based at Small City Middle School. Andrews and Thompson teach a series of middle grades courses on-site, looping with the teacher candidates in the PDS cohort for their entire two years in the teacher education program.

Genius Hour as Teacher Inquiry: The Teacher

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education (2016). He completed a year-long internship at SCMS his final year in the undergraduate teacher education program, 2013-2014. He attributes his unwavering dedication to finding a teaching position at SCMS to the exceptional experience he had while he was placed at the PDS as a teacher candidate. In fact, Naughton spent the 2014-2015 school year as a full-time graduate student and a part-time substitute teacher at SCMS, eager for any and every opportunity to maintain his connection to the school. He turned down at least two other job offers in spring 2015 while he hoped and waited for a position to become available at SCMS. He got hired at SCMS in June, so in the summer of 2015, Naughton was wrapping up his graduate coursework and preparing for his first year in the classroom.

Naughton took an online graduate class, *EDMS 7030e: The Middle Grades School*, with Gayle Andrews in summer 2015. The course enrolled both teachers and teacher candidates connected to SCMS. Graduate students in the course completed a service-learning project that benefited SCMS students and teachers, designing standards-based activities to engage children and youth during the August festival that serves as a non-traditional open house to launch the school year (Blankenship, Nix, Andrews, & Thompson, 2015).

Andrews used Genius Hour as a framework for teacher inquiry for the first time in that summer 2015 graduate course. Here's how Genius Hour was introduced to the class:

> Genius Hour gives you a chance to identify something you're passionate about within the world of schooling for young adolescents and then spend this semester delving into your passion, reading, researching, and creating tools/resources that you and others can use. Instead of a formal paper that only your instructor would read to report what you discover, you'll write blog posts, seek feedback from your Kid Consultants [young adolescents who worked with the graduate students throughout the course], and give feedback to one another on your projects. You'll come up with a strategy for sharing your work with your classmates, create a rubric to assess your work, and then share your Genius Hour Project with your classmates and submit to me your assessment of your work on the project using your rubric. (Andrews, 2015, p.38)

Naughton joined his SU graduate student colleagues in working on Genius Hour projects. They explored topics of personal interest to them that fit within the bounds of the graduate course, specifically by focusing on topics connected to middle grades education and the lives of young adolescents in their homes, schools, and communities. They investigated everything from how to use Genius Hour in a middle grades science or math classroom with young adolescents to strategies for increasing student voice and choice in the classroom and measures that middle grades teachers can take to combat the unrealistic ideals for young adolescents portrayed by appearance-focused media.

> Naughton describes his Genius Hour experience from that summer 2015 graduate course. *The question I chose to pursue for my Genius Hour project* – How can middle grades math educators teach for social justice? – *felt like a natural progression in my professional development, as the topics of social justice education and critical pedagogy have long been engaging and compelling to me. From there, the manner in which each student in the graduate class researched their Genius Hour question was very flexible and student-centered. I perused through various literature on topics related to mine, looked through online databases, and even participated in Twitter chats. We were also given the freedom to present our findings in whatever way we chose. Some students made posters while others*

> *wrote papers, but I chose to create a* Wordpress *blog separated into different sections in an attempt to coherently organize my findings.*
>
> *My biggest, overarching takeaway from doing my Genius Hour project was that the answer to my question wasn't necessarily about finding specific lesson plans or resources (although I did find those). Rather, teaching for social justice, regardless of content or grade level, is about adopting a particular mindset, and it is this mindset that I have tried to carry with me as I conclude my first year of teaching (2015-2016). My research also lives on in the qualitative [action] research that I am conducting in my final semester of graduate school, in which I am interviewing several middle grades teachers on the topic of teaching for social justice.*

Naughton offers a compelling answer to the reflection question we often ask our graduate students and teacher candidates as they complete a project: "So what?" For him, the takeaway from his Genius Hour project is a mindset, an approach to thinking about teaching for social justice that continues to guide his decisions as a beginning teacher and prompt new questions about his practice.

Based on Naughton's experience, as well as feedback and reflections from the other graduate students in the course, it seemed clear that Genius Hour could help teacher candidates and teachers establish the habit of inquiry to transform practice. When passion informs inquiry, that passion drives focused investigation, yields ideas and innovations, and generates energy and enthusiasm for more inquiry.

Genius Hour as Teacher Inquiry: The Teacher Candidate

In the Co-PIRs' fall 2015 on-site course at Small City Middle, Andrews and Thompson made the decision to use Genius Hour with the new cohort of middle grades education teacher candidates, giving them the opportunity to explore questions of personal interest to them that also connected to middle grades education and young adolescents.

The teacher candidates brainstormed ideas in class with some prompts to guide their thinking, and when they settled on their Genius Hour focus, they each recorded a brief video (no more than 90 seconds) using an application called *Flipgrid*. In the video, the teacher candidates described their own Genius Hour questions, explained why they were interested in that question, and how they planned to pursue the question. With 40 teacher candidates and videos lasting only 60-90 seconds, they could all watch everybody's videos in well under an hour and get a sense of the scope of the questions, find overlaps with their own questions, and see what their colleagues were excited about investigating.

The teacher candidates created *Wordpress* blogs to document what they were learning and share their emerging genius. They researched their Genius Hour questions using relevant literature and other resources, social media, surveys, interviews, observations, etc. They also followed each other's progress on the Wordpress blogs and in-class Genius Hour work sessions, sharing ideas and relying on each other for support and resources. Here are a few examples of the Genius Hour questions that the teacher candidates pursued:

- Why is talking about mental health important in the middle grades?
- How are extracurricular activities beneficial to students?

- How can we make a positive difference in addressing the racial achievement gap?
- How can we keep grammar relevant in the classroom? How can we do it without boring our students?
- How does a middle school student's insecurity hold them back from participating in the classroom, and how can I as an educator help them develop confidence in the classroom?
- How can we ditch the desks and get students more actively engaged in learning?
- How can I incorporate social-emotional learning in my English/language arts classroom?

One of the teacher candidates, Morgan Waters, actually has done two Genius Hour projects: one for the summer 2015 master's level course that Andrews taught and then another in the fall 2015 course taught on-site at Small City Middle. Waters chose two different Genius Hour questions, and she describes the one that she used for the fall 2015 on-site methods course below:

> *My Genius Hour took the theme of the widely recognized movie,* Mean Girls, *which incorporates many perspectives from adolescent girls and depicts their lifestyle and struggles. Through taking aspects of the movie—such as bullying, self-esteem, and belonging—I found that while the movie may be considered "fiction," these struggles are actually occurring among our adolescent girls every day, everywhere.*
>
> *I surveyed 67 young adolescent girls in grades 6-8 to investigate their perceptions related to bullying and peer pressure. The girls described from what sources they feel the most pressure:*
>
> - *28.4%: Parents*
> - *23.9%: School/Teachers*
> - *22.4%: Friends*
> - *22.4%: Government officials/police*
> - *2.9%: Internet*
>
> *In response to more open-ended questions, the girls depicted tensions they experience.*
>
> - *More freedom, but more pressure from adults*
> - *New peers in the middle grades, but also a struggle to fit in ever-evolving cliques*
> - *Puberty with hormonal and physical changes that could be positive, negative, or just confusing*
>
> *They also highlighted the impact of various forces that they described in negative terms, including comparisons to their peers often resulting in negative body/low self-image issues and the internet with the constant comparisons to the media's depictions of females and the potential for social media as a source of cyber-bullying.*
>
> *I asked these young adolescents what we as adults can do, and their responses focus on proactive instead of reactive possibilities. I also did research to identify options that would address concerns the girls raised. Here are some things we as adults can do to make the existence of "mean girls" less likely:*
>
> - *Educate kids about the media and its perceptions and effects on women.*
> - *Engage with students in settings outside the classroom.*
> - *Create and support Girls' Clubs.*
> - *Exercise patience. What is a big deal to girls might not seem like a big deal to us, but remember you were once there, too.*
> - *Get to know students; don't pass judgment.*

When Waters completed her Genius Hour project on "mean girls" in fall 2015, she was in her first full semester as a teacher candidate. As her Genius Hour investigation and targeted recommendations make apparent, her experience with Genius Hour helped propel her both into professional learning and into seeing herself as a change agent in her classroom and community. Waters completed a year-long internship at SCMS in 2016-2017. She took the lead in organizing the annual fall festival at SCMS in fall 2016, just one example of how she has taken up one of her own recommendations—engage with kids outside of school. She organized a fund-raising and gift collection campaign for a SCMS family who lost their home and all their possessions in a fire just before the winter holiday break. In the process, she helped others in the school and in the community "see" that family as their neighbors and friends. Communities are built on trusting relationships. Waters seems to have used her Genius Hour work on mean girls as a launching pad for a broader effort to build relationships and communities.

Genius Hour as Teacher Inquiry: The Genius Hour Fair

At the end of fall semester 2015, Andrews and Thompson organized a Genius Hour Fair in the SCMS media center during teachers' planning periods. Teacher candidates shared their Genius Hour projects and engaged in conversations with practicing teachers, and they also had opportunities to learn from one another. The Genius Hour Fair served as reciprocal professional learning for all involved, generating ideas and excitement about pursuing passion projects related to middle grades education and young adolescents.

The teacher candidates reflected on their learning and experiences related to Genius Hour, including in connection to the Genius Hour Fair. Some of their comments are excerpted below:

Teacher Candidate 1—Genius Hour Project: Pushing Through Insecurity
One thing I realized as I was presenting was that I care more about my topic than I realized. I found myself going off on tangents about how to make students feel loved and valued because I discovered that the root of my original interest in my topic was a deep desire to let each student know that they are loved and special, regardless of what they think about themselves. The methods I found to encourage students' confidence in the classroom are methods that I am so excited to use in my own classroom one day. In my opinion, each student should be able to walk into a classroom and feel safe, comfortable, important, and confident in their ability to learn and achieve.

Teacher Candidate 2—Genius Hour Project: Math Technology in the K12 Classroom
[Genius Hour Fair] was such a fun day, and I learned a lot from other math teachers who provided me with more apps they enjoyed, teaching strategies, and tips for my own classroom! I am so grateful to have had this time with them today in the library!

Teacher Candidate 3—Genius Hour Project: Educating the Black Child: Exploring the Achievement Gap & Making A Change
My sharing hour went very well. I had amazing conversations about racial issues in education and the real world. I learned so much today, and I am inspired to do even more research on this question!

Teacher Candidate 4—Genius Hour Project: Getting Grammar: Refocusing on the Beauty and Complexities of the English Language

The biggest thing I learned is that, as educators, we must accept that grammar is fluid. Language is fluid, and organic, and ever-changing…therefore, we must treat it as such in our classrooms. I talked about changing the stigma of the standards, which ask our students to "command" (read: be commanded by) grammar practices. I find this term troubling and would prefer the term to be "explore" or "question." We need to create a generation of students who are comfortable talking about language and discussing different dialects. Standard English will always be important, but so many other types of language are important as well. Let's keep the conversation going–don't forget grammar!

One teacher candidate's comment seems to capture the sense of the cohort regarding their Genius Hour experience: "I found that *passion drives teaching*!"

During the Genius Hour Fair, SCMS faculty and staff had an opportunity to comment on their thoughts related to Genius Hour using an online virtual wall called *Padlet* for conversation, brainstorming, and feedback. A sampling of their comments reflects the inspiration they found and how impressed they were with the teacher candidates' Genius Hour work, with the first example listed showing an undeniable parallel to a teacher candidate's reflection:

- "*Passion drives teaching*, and if the passion I saw here this afternoon is any indication of our future, I think we have reason to be hopeful."
- "Love that these future teachers are already thinking about the realities that they will see within their own classrooms…. Good luck incorporating all of this into your own classrooms (because you should)!"
- "Thank you for some excellent strategies and ideas I will use in my classroom TODAY! Everyone I talked to was knowledgeable and passionate!"
- "It is good to see how thoughtful these upcoming teachers are. Every one of these presenters knew how they were going to apply their work in their future classrooms."
- "The questions presented showed a keen insight into the issues we face every day in a middle school. The very timely topic of Graphic Novels was astutely expressed, as I have been one of those who hasn't used them, but one who really wants to."

Naughton summarizes the reactions of his SCMS colleagues to the Genius Hour Fair:

> *Feedback from Small City teachers was overwhelmingly positive. Some said that they left the fair with ideas that they felt they could use in their own classrooms that very day. Many were blown away at the breadth of knowledge that these preservice teachers now possessed, while others simply took inspiration from how these students' passions were driving their future teaching.*

The idea that passion drives teaching is perhaps the most striking takeaway from the Genius Hour Fair for novices and veterans alike. Genius Hour offers an open approach to inquiry that supports any question, so long as it can somehow be connected to middle grades education. The key elements of intrinsic motivation—autonomy, mastery, and purpose—were evident as the teacher candidates had the freedom to follow their hearts. The teacher candidates and the SCMS teachers seemed to revel in the opportunity to share their passions and learn from one another.

Genius Hour as Teacher Inquiry: To Be Continued

We used Genius Hour as a framework for teacher inquiry in the hope that it would provide a non-threatening, even energizing, approach to delving into problems of practice. If passion drives teaching, then we hoped that passion would also drive inquiry. Data from teacher candidates', graduate students', and SCMS teachers' reflections appear to support the value of Genius Hour as an initial framework for teacher inquiry. The reciprocal professional learning, especially in the context of the Genius Hour Fair, seemed to generate ideas and excitement around passion projects related to middle grades education and young adolescents.

Nancy Dana's extensive work on teacher inquiry (see Dana, 2013, 2016) provides rich and comprehensive guidance for our next steps. We are trying to build a bridge from a Genius Hour framework for inquiry in the PDS to a more formal and structured approach based on Dana's articulation of an inquiry cycle. During the 2016-2017 school year, the teacher candidates who did Genius Hour projects in the PDS are conducting teacher inquiry throughout their year-long internships. At the end of spring semester 2017, the teacher candidates will share their teacher inquiries with the faculty of SCMS in a Teacher Inquiry conference. The TI conference will feature individual breakout sessions for each teacher candidate's inquiry with time for in-depth conversations between and among SCMS teachers and teacher candidates. Hopefully, the TI conference will yield reciprocal professional learning akin to the Genius Hour Fair. In their examination of teacher inquiry in a PDS, Dana, Silva, and Snow-Gerono (2002) commented, "Mentor teachers gained space to understand inquiry through inquiry projects conducted by preservice teachers" (p. 71). Like the Genius Hour Fair, the TI conference is intended to support teacher candidates and SCMS teachers in considering how their passions can fuel their professional learning, enhancing their genius with autonomy, mastery, and purpose.

In a final post to his original Genius Hour blog, SCMS teacher Naughton captures essential elements of an approach to professional learning grounded in inquiry:

> *"The only true wisdom is in knowing you know nothing." –Socrates*
> *This is where I find myself as I conclude this project. In reflecting upon what I have learned, I am left with the realization that I still have so much left to learn. This is a daunting thought to wrap my head around, one so overwhelming that at times it may feel a bit discouraging. However, I think there is comfort to be found in the idea that I will never be perfect and that there is always room to grow, especially if we embrace the belief that educators are lifelong learners. Hopefully, this new understanding is the first step in my development as an effective teacher of social justice, particularly within the realm of middle grades mathematics.*

Our goal is to support teacher candidates and practicing teachers in taking "inquiry as stance" in the PDS (Cochran-Smith & Lytle, 1999, 2009). An inquiry stance is a theory of action for school improvement that positions teachers and other practitioners as change agents whose "collective intellectual capacity" (Cochran-Smith, 2013, p. xii) drives transformation. Educators who take an inquiry stance toward their practice lead improvements in teaching and learning as a natural outgrowth of their ongoing engagement in the cycle of inquiry related to their professional passions: identifying problems of practice and related questions centered on student learning;

investigating those questions; trying out interventions, actions, and strategies; and discovering new questions to investigate (Hine & Lavery, 2014; Johnson, 2012).

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Deliberate Investigations of a Flipped Class

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Abstract: This article summarizes two action research projects completed under the direction of an eighth-grade mathematics teacher, who served as the mentor teacher for two teacher candidates from the University's School of Education. This new professional development school was in its first two years of a one-to-one initiative. In AY15, the mentor teacher, intern, and university faculty collaborated on a study of their adoption of a flipped classroom approach to instruction. Two focus questions were examined: 1) What are eighth grade mathematics students' perceptions of a flipped classroom instructional approach? and 2) What impact does a flipped mathematics classroom have on eighth grade mathematics student homework submission? In AY16, the mentor teacher, a new intern, and the university faculty continued the examination of the flipped approach and added a third question; 3) What impact does a flipped mathematics classroom have on eighth grade mathematics student engagement during class? Results from both years indicate a majority of student participants reported favorable responses to the flipped classroom approach. Homework submissions throughout the flipped segment of both studies remained high and student engagement in the flipped setting was higher than in the traditional setting. In the flipped setting sampled students spent more time working on mathematics topics and collaborating with peers than in the traditional setting; while sampled students in the traditional setting spent more time taking notes.

KEYWORDS: inquiry, technology, flipped classroom, mathematics, teacher preparation

NAPDS NINE ESSENTIALS ADDRESSED:

2. A school–university culture committed to the preparation of future educators that embraces their active engagement in the school community;
3. Ongoing and professional development for all participants guided by need;
4. A shared commitment to innovative and reflective practice by all participants;
5. Engagement in and public sharing of the results of deliberate investigations of practice by respective participants

Introduction

The National Association for Professional Development Schools' Nine Essentials define what it means to be a professional development school (PDS). Essential five calls for participants to engage in and routinely reflect upon best practice (Brindley, Field, & Lessen, 2008). In 2009-2010 the University's School of Education and their PDS partnership decided that all interns (senior-level teacher candidates) would engage in action research projects to investigate classroom practices as a capstone experience. While action research has many definitions and can fall under a variety of paradigms, Yendol-Hoppey and Franco (2014) summarized the concept as a form of practitioner research where individuals systematically study their own practices and identified it is a signature pedagogy of professional development schools. Dana and Yendol-Hoppey (2008) also stressed the value of action research to the education process, "Rather than sweeping the problems under the carpet and pretending they don't exist, teachers who conduct action research…welcome problems by deliberately naming them, making them public, examining them, and making a commitment to do something about them" (p. 11).

In spring 2014, the School of Education established a new PDS partnership with a local middle school. This new partnership committed itself to research and to examine best practice as collaborative partners. This article highlights a pair of collaborative action research projects that examined a flipped classroom instructional approach over the period of two academic years. The case serves as an exemplar of action research conducted on the newly established PDS campus.

Rationale for the Study

The current studies rest upon converging concepts: a) that teacher effectiveness is critical to student success (Schacter & Thum, 2005); b) that action research as a form of teacher-directed professional development encourages instructional experimentation (Jones, Lubinski, Swafford, & Thornton (1994); c) that engaging in deliberate investigations of practice is critical for all PDS participants (Brindley et al., 2008); and d) while one-to-one initiatives are gaining popularity, more teachers are experimenting with a flipped classroom instructional approach (Project Tomorrow, 2015).

Related Literature

Schacter and Thum (2005) state that teacher effectiveness is "the single most important school-related factor responsible for increasing student achievement" (p. 328). Additional factors, such as lesson design and classroom activities, contribute significantly to teacher effectiveness (Henson, 2002). Teacher effectiveness may be improved through professional development by encouraging teachers to study their own practices and influence the profession from the inside out (Moran, 2007). Guskey (2000) suggested that professional development was not an event that was separate from one's day-to-day professional routine. Successful professional development is on-going and embedded in the process of developing lessons, instructional activities, and student assessments. Since teachers are in the trenches of the classroom, decisions about instructional changes should come from teacher-directed professional development.

Action research is one form of teacher-directed professional development. As a model of teacher-directed professional development, action research provides a structure for teachers to

systematically investigate their instructional practices in order to improve effectiveness (Dana & Yendol-Hoppey, 2009). According to Jones et al. (1994), educational challenges are best identified and investigated at the classroom and school levels. Local investigation is an essential role of being a professional development school (Brindley et al., 2008).

Researchers have considered the value of professional development that is driven and conducted by teachers rather than by people outside the school community. The theory behind this approach is that the teachers in a school or district are truly the experts when it comes to what the other teachers and students in that district need to increase success. Castle and Aichele (1994) emphasize the need for autonomy and personal decision-making for the classroom teacher. Like students, Castle and Aichele (1994) note that, "when teachers are told what to do, they do not think: they just respond. Since the activity was not of their choice, they do not find it personally meaningful" (p. 5). Models that are much more collaborative in nature are classified as inquiry models of professional development (Loucks-Horsley et al., 2003). Action research is a model that falls into this category.

Action research is a teacher-driven form of research wherein teachers decide what will be studied. There is no formalized research design specific to action research. Teachers work in collaborative teams to answer a question that is of concern to all of them or work individually on a question that is only a concern to a single practitioner. The research question can be driven by concerns about curriculum, student behavior, parent participation, classroom management, or test results. The literature agrees, however, that action research has certain characteristics (Hendricks, 2006; Merther, 2006; McNiff & Whitehead, 2006; Holly, Arhar, & Kasten, 2005; Thomas, 2005; Dana & Yendol-Silva, 2003; Tomal, 2003). Action research is meant to be carried out by educators, ideally in cooperation with at least one other educator. Action research is a reflective process that is meant to provide a framework for educators to analyze what goes on in schools with students. Finally, action research is a way for teachers to feel empowered to find solutions to their own problems.

A growing body of scholarship indicates action research is an important component to developing teachers as researchers (Auger & Wideman, 2000; Capobianco & Ríordáin, 2015; Moran, 2007; Chant, Heafner, & Bennett, 2004;); however, uncertainty plays a significant role when *preservice* teachers conduct action research. Preservice teachers question the effectiveness of their instructional strategies and their students' understanding. Compounded with the task of studying their own practice through action research, teacher candidates face a myriad of concerns. Capobianco and Ríordáin (2015) report four uncertainties identified by preservice teachers engaged in action research: 1) the validity of action research data; 2) the time demands of action research in addition to their course requirements; 3) the perceived value of action research by self and others; and 4) the complexity of the action research process. Capobianco and Ríordáin concluded that school context and support provided to preservice teachers is critical for teacher candidates to embrace and become teacher researchers.

Subramaniam (2010) sought to determine the images that preservice teachers used to frame themselves as teacher researchers. Findings revealed two distinct images; the first image connected to self-fulfillment--preservice teachers viewed the action research experience as either an assignment to be completed or as an opportunity for professional growth. The second image addressed action research space, which had two attributes--a "friendly" action research space or an "unfriendly" action research space. Preservice teachers who experienced a friendly space felt their cooperating teachers supported the action research process; preservice teachers in an

unfriendly space received limited or no support from the cooperating teachers for the action research process. Support from all constituents must be present; hence, the collaborative nature of a professional development school, with support from administration, university faculty, and mentor teachers, would be an ideal environment for investigations of practice (action research).

The new middle school PDS is one of many schools that have adopted one-to-one computing initiatives that seek to provide personal devices and Internet access to students for use at home and school. One published meta-analysis and one currently under review provide a comprehensive overview of the one-to-one initiative. Recently published in the *Review of Educational Research*, Zheng, Warschauer, Lin, and Chang (2016) identified 96 studies to include in their literature review; 10 of which were included in their meta-analysis as a result of meeting more rigorous criteria. All of the studies in the meta-analysis included middle school students (grades 6-8). The, as yet unpublished, review completed by Bethel and Bernard (2016), identified more than 1,300 K-12 one-to-one laptop studies; 88 of which met the more rigorous criteria for inclusion in the meta-analysis. Both of these meta-analyses conclude that such initiatives have a positive impact on student learning. Likewise, one-to-one initiatives and other intensive technology integration strategies, as reported in a recent Johns Hopkins review (Morrison, Morrison, & Ross, 2016), "increased student-centered instruction. Teachers had additional tools and time they could devote to individualized instruction to meet the needs of specific learners." A flipped classroom instructional approach is one such student-centered strategy.

As more school districts adopt one-to-one initiatives, more teachers are experimenting with flipped classrooms. As reported at the American Association of School Administrators' national conference, "for the third consecutive year, 4,326 building and district administrators from 2,600 school districts are seeing a significant increase in teachers flipping their classrooms" (Project Tomorrow, 2015). The Speakup 2014 National Research Project Findings indicate that the number of administrators and teachers who had never heard of the concept of flipped classrooms has dropped to 12% and 7% respectively (Project Tomorrow, 2015).

Flipped classrooms reverse traditional learning environments by delivering content outside the classroom. A flipped classroom requires students to watch recorded video presentations using Internet media services prior to class. During class, students complete activities designed to support or assess their understandings of the concept previously presented. When using a flipped classroom approach, rather than presenting the concept in class, teachers allow students to investigate the concept that was introduced during the video presentation outside of class (Lage, Platt, & Treglia, 2000).

These areas: teacher effectiveness, action research, PDS work, and flipped learning inspired the collaborative investigations, which were two of many such investigations on the PDS campus. These studies illustrate the nature of PDS work and action research. Working together, the various members of the PDS community shared a commitment to collaborative teacher-led investigations, in a supportive environment, where questions about classroom practice could be raised, data collected, results analyzed and practice adjusted accordingly.

Context of the Study

To avoid the negative perceptions identified by Subramaniam (2010), where preservice teachers might perceive action research as just another assignment to complete, the School of Education and its PDS partner campuses encouraged all teacher mentors to engage in deliberate

investigations with their interns. As a means of supporting mentor teachers in this initiative, the partnership conducted a day-long professional development session focused on action research, essentially following the model articulated by Dana and Yendol-Hoppey (2009). The first phase created an understanding of action research and why it is critical for teachers to engage in the process and examine classroom practice. The second phase helped mentor teachers form researchable questions (wonderings). During the third phase, participants brainstormed what data was needed to answer their questions, how that data might be collected, and how the collected data would be analyzed. The day ended with a discussion of ways the partners could share research findings both within and outside of the PDS campuses.

Many of the mentor teachers and the campus principal from the newly identified middle school PDS participated in the one-day action research professional development. Teachers who attended the professional development did not yet know if they would mentor a preservice teacher during the upcoming year; therefore, their level of commitment to a collaborative action research project could not be determined at that time. That same summer, the middle school PDS was to embark upon its first academic year as a one-to-one campus, where every middle school student would be issued an iPad. All middle school teachers received iPads the semester before in order to prepare for the student distribution.

In August 2014, mentor teachers at the middle school PDS were introduced to their preservice teachers (interns). One mentor, an eighth -grade mathematics teacher who had attended the summer professional development on action research, quickly shared his wondering with his intern to determine if they might collaborate on an inquiry. The mentor teacher had heard about and read extensively about flipped classrooms. With the distribution of an iPad to every student, he wanted to implement a flipped classroom and investigate how students responded to this instructional approach. The intern excitedly agreed to collaborate on the inquiry.

Prior to beginning the investigation, the mentor teacher and intern had to establish the flipped classroom approach. During the implementation, the flipped classroom consisted of the following:

- determine the content and practice problems;
- record the video in several short segments using iMovie on the iPad;
- transfer the video to the computer;
- upload the video to YouTube; and
- log student homework submitted electronically.

Each video lesson usually included direct teaching of the identified content, from which students were to take notes; several examples of the problems being taught (worked out in detail); and 2-4 practice problems students completed without assistance and submitted electronically to the teacher before the next class meeting. Class time the following day consisted of five minutes checking the practice problems, five minutes answering questions from the video, and the remaining class time extended the mathematics experience through activities, games, projects, and applications. After establishing the flipped classroom approach, the mentor and intern began their investigation. During academic year 2014-2015 (AY15), the following questions guided the initial inquiry:

1. What are eighth grade mathematics students' perceptions of a flipped classroom instructional approach?
2. What impact does a flipped mathematics classroom have on eighth grade mathematics student homework submission?

These guiding questions were collaboratively established based on the wonderings of the mentor teacher and the intern, demonstrating the PDS commitment to shared inquiry at the local level. In academic year 2015-2016 (AY16), the second year of the one-to-one initiative at the middle school PDS, the same eighth grade mathematics teacher again served as a mentor and shared with his newly assigned intern the action research from the previous year and his desire to continue researching student perceptions of the flipped classroom approach. The second intern agreed to collaborate on the action research, yet also moved in a more independent direction (consistent with the principle that action research is led by the individual teacher). The second intern wanted to examine student engagement during class time at school. As a result, the second year (AY16) of this inquiry added a third guiding question:

3. What impact does a flipped mathematics classroom have on eighth grade mathematics student engagement during class?

Methodology

Participants

The study was conducted in a large suburban middle school with a typical annual enrollment of approximately 1,200 students; the ethnic breakdown of the school is generally 56% Caucasian, 23% Hispanic, 14% African American, 5% Asian, and 2% Other. Low socioeconomic status applies to approximately 33% of the population.

Participants in the first year of the study (AY15) consisted of 151 eighth graders enrolled in algebra or eighth grade pre-AP mathematics. Participants for the second year (AY16) consisted of 148 eighth graders enrolled in algebra, eighth grade pre-AP mathematics, or regular eighth grade mathematics. In total, 299 eighth grade students participated in the study.

Participants in this study experienced two different instructional approaches in their daily 45-minute mathematics class. During the first month of the study, the mentor teacher and interns used a traditional approach to teaching mathematics--students were introduced to concepts, engaged in activities, and applied their understandings while in their assigned class periods. After the first month of the study, the teacher and interns "flipped" the classroom--students were introduced to concepts by watching a teacher-created video lesson at home on their school district-provided iPads. After watching the lesson at home, students engaged in activities and applied their understandings of the topics while in their assigned class periods. Prior to initiating data gathering for each year of the study, the instructor and interns conducted several lessons using the flipped classroom approach to introduce the eighth-grade mathematics students to the concept. The teacher candidates participated fully in the alternating instructional processes. Candidates created instructional videos and planned classroom experiences following the model established by the mentor teacher. Candidates were also encouraged to try their unique approaches to the process, consistent with a PDS environment seeking to maximize impact on student learning.

Data Sources

Over the course of the two years, a number of methods were used to gather data to address the guiding questions. Within the PDS environment, these methods were brainstormed, discussed, and selected collaboratively by those members of the PDS community that would be implementing

the study: teacher candidates, mentor teacher, university liaison, and campus administrators. Participants in AY15 completed an electronic survey at three points during the process (after initiating the flipped classroom approach; at the midpoint point of the flipped classroom approach; and at the conclusion of the study). All data reported in this study was gathered on the final survey.

The electronic survey consisted of three questions. The first question focused on students' overall perceptions of the flipped classroom approach. Answer choices included "really like," "like," "don't have an opinion," "don't like," and "really don't like." The second question focused on the specific component of watching the video lesson at home and students' perceived impact on homework. Answer choices were framed for particular circumstances: "I love watching the videos and taking notes at home. It helps me get my work done in class and I have less math homework than I did last year;" "I love watching the videos and taking notes at home, but I still have about the same amount of homework as I did last year;" "Watching the videos and taking notes at home is OK. I don't love it, but I don't hate it either;" and "I'm not a big fan of watching the videos and taking notes at home. I'd rather take notes in class and do the work at home." The third question allowed students to select from among ten statements that described various aspects of the flipped classroom approach. Multiple statements could be selected by an individual student. The statements addressed such aspects as classroom arrangement, personal responsibility, and interaction with the instructor. These data were used to ascertain student perceptions of the flipped classroom approach.

During both years, a record of completed homework submitted on time provided data for the second guiding question. Homework during the flipped classroom approach was not the typical paper-and-pencil assignment. Homework in the flipped setting was limited to making sure the students watched the video, took notes, and completed the assigned practice problems. At the conclusion of the first year's study, the mentor teacher conducted class-wide interviews with the student participants and recorded anecdotal data that would serve as the basis for a new data gathering strategy in the second year of the study. This would serve as a reflective piece for the inquiry practices of the mentor teacher.

During the second year of the study (AY16), instead of completing the three electronic surveys, students completed open-ended questionnaires (modified by the input of the new intern and based on the mentor teacher's anecdotal data from the previous year's class-wide interviews) at the conclusion of the study. The prompts on the questionnaire asked students to identify: their preferences (with rationale) for either the traditional or flipped classroom; differences in their participation levels between settings; benefits from watching the video lessons prior to class; and the characteristics of both approaches that they liked and disliked. These data provided greater detail and insight regarding the students' perceptions of the flipped classroom approach.

To address the added guiding question related to student engagement during class time, the specific wondering of the second teacher candidate, the researchers trained five observers (members of the PDS campus community) to complete 10-minute samples throughout the course of the study. The training included all levels of the PDS structure (candidates, mentor, campus administrators, site coordinator, and university faculty). This shared training helped establish consistent rater interpretation (inter-rater reliability) of observed behaviors. Likewise, the discussion surrounding the selection, modification, and adoption of the recording instrument increased the potential that observers would collect similar data—increasing the validity of the data.

Each sample required the observer to randomly select six students to observe during a 10-minute timeframe. At 30 second intervals, observers recorded whether each of the six students was on-task (appropriately attending to the current activity) or off-task (not attending to the current activity). On-task behavior was subdivided into five categories to enable the researchers to differentiate the types of student engagement that might potentially appear in the different settings. Off-task behavior had only two subdivisions—general off-task behavior and talking about anything other than content (identified by the mentor as a potential problem with the flipped classroom approach).

Observers completed 31 samples in the traditional setting (310 minutes; 186 randomly selected students observed), and 36 samples in the flipped classroom setting (360 minutes; 216 randomly selected students observed). The form used to record these samples appears as Appendix A the end of the article. These data were used to extrapolate student engagement over the course of the study.

The electronic survey (AY15 only) provided data for the study's questions related to student perceptions of the flipped classroom approach and the impact on homework submissions. The homework tallies (AY15 and AY16) provided data on the homework submissions question. The 10-minute engagement samples (AY16 only) were the data source for the student engagement question; and the open-ended questionnaire (AY16 only) gathered qualitative data related to all of the study questions.

Data Analysis

All student responses from the electronic surveys (AY15 only), the homework submission tallies (AY15 and AY16), and the 10-minute engagement samples (AY16 only) were analyzed using descriptive statistics. Quantitative data from the 10-minute engagement instrument was analyzed for the percent of time on-task and the percent of time off-task. Percentages were also calculated for each subdivision of on-task and off-task behavior.

All responses to the open-ended questionnaire (AY16 only) were independently read and verified by two members of the PDS community that coded data based on an inductive analysis--where themes, categories, and patterns emerged ''out of the data, through the analyst's interactions with the data'' (Patton, 2002). Researchers independently coded the data sources, then compared, discussed, and verified their coding to assure validity and accuracy of the findings. Had a discrepancy occurred, a third researcher would have been consulted; however, no third person review was necessary.

Results

Data were analyzed to answer the three guiding questions:

1. What are eighth grade mathematics students' perceptions of a flipped classroom instructional approach?
2. What impact does a flipped mathematics classroom have on eighth grade mathematics student homework submission?
3. What impact does a flipped mathematics classroom have on eighth grade mathematics student engagement during class?

Student Perceptions

Analyses of responses to the post-study electronic survey in AY15 reveal that 60% of eighth grade mathematics students participating in the study had a positive reaction to the flipped classroom instructional approach; these students responded, "really like" or "like" to the first survey prompt. While a different strategy was used to gather data in AY16, 95% of eighth grade mathematics students participating in the study indicated that they "preferred" the flipped classroom approach over the traditional approach on the open-ended questionnaire. A qualitative analysis of the written rationales included by participants (on the AY 16 open-ended questionnaire) arrived at three primary reasons for preferring a flipped classroom approach:

a) students enjoyed going at one's own pace; not waiting on classmates;
b) students perceived having more class time to address concepts being taught; and
c) students perceived content was easier to grasp because they could watch the video lesson as many times as needed to understand the concept.

These statements, derived from the qualitative data in AY16, are consistent with quantitative data gathered through the electronic survey in AY15. When asked to select all statements that described how they felt from a list of statements about the flipped classroom approach, more than 70% of the students selected the same three statements and all three of the statements were in the top four most popular responses:

a) "I like the opportunity to review the lesson as many times as I need to" (70%).
b) "I have more time in class to finish my work" (73%).
c) "I have more time in class to ask the teachers a question if I don't understand something" (74%).

Homework Submissions

The structure of the flipped classroom approach, where the initial exposure to content is presented outside of class time, creates an extensive demand on work completed at home. In the present studies, students were required to watch a video lesson and complete practice problems at home. The results were to be emailed to the teacher prior to the next class meeting. Tracking the number of times students submitted the required assignments on time was intended to gauge the impact the flipped classroom had on homework submissions. The graph in *Figure 1* shows the percentage of homework submission completed on time by academic year and class. The homework tally is the only data that was consistently gathered across both AY15 and AY16.

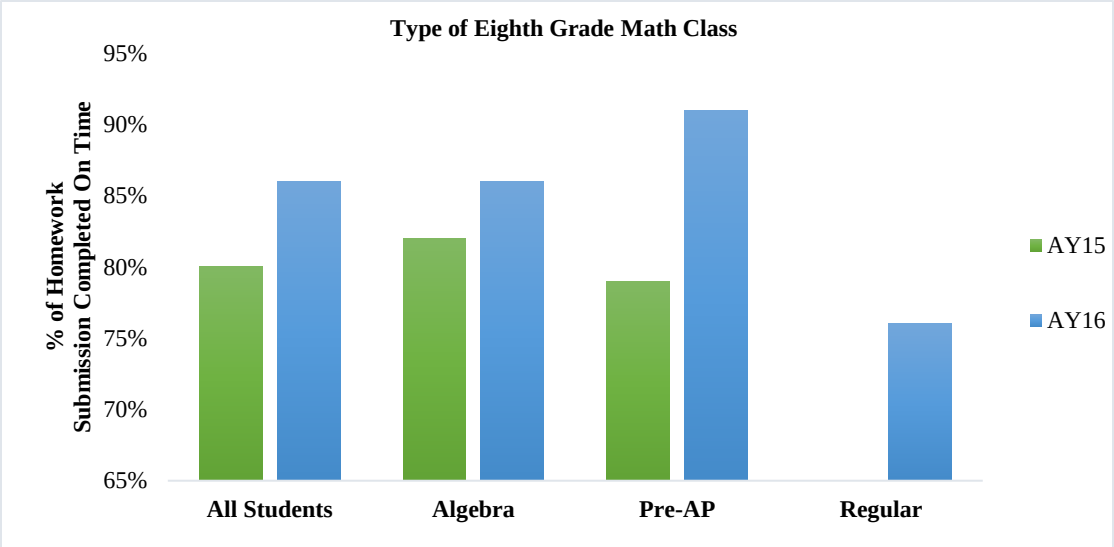

Figure 1. Percent of homework submissions completed on time by year and class. *Note.* Calculated as the number of homework assignments submitted on time divided by the total number of homework assignments. Data were disaggregated by type of eighth grade math class.

As illustrated in *Figure 1*, homework submissions were approximately 80% for all eighth-grade mathematics students participating in the study in AY15. Homework submissions were at 86% in AY16. Eighth grade students in the pre-AP class in AY16 reported the highest percentage of completed on time homework assignments (91%). The lowest percentage of on time completed homework assignments were completed by students in regular eighth grade mathematics classes in AY16. The study did not include regular math classes in AY15; therefore, no data appears in the graph. Homework submissions were not tracked during the traditional classroom segments of the studies.

Student Engagement

Student engagement became the focus of the second study in AY16. A grand total of 670 minutes of class time were sampled to provide data about student engagement (310 minutes in the traditional setting and 360 minutes in the flipped classroom setting). These time samples represent about 12% of the total time eighth grade students spent in the three classes (algebra, eighth grade pre-AP, and eighth grade math) included in the study (670 minutes/5400 minutes—approximated at 45 minutes per class period for five days for eight weeks for three classes). Table 1 summarizes the percent of time sampled students were on- and off-task in each of the class settings.

Table 1. Percent of Time Sampled Students Were On-Task or Off-Task by Setting

Status	Traditional Setting	Flipped Classroom Setting
On-Task	84.1%	92.4%
Off-Task	15.9%	7.6%

Data indicate that sampled students were off-task 15.9% of the time; extrapolated to an entire 45-minute class period, that represents 6 minutes and 45 seconds. Over the course of a week,

that might represent a loss of more than 32 minutes (almost an entire class period) of instructional time. The flipped classroom setting reduces that amount by almost half. Sampled students in the flipped classroom were off task only 7.6% of the time; extrapolated to an entire 45-minute class period, that represents 3 minutes and 42 seconds. Over the course of a week, that might represent a loss of only 17 minutes of instructional time.

On-task behavior in both settings was examined more closely. Five subdivisions were established for on-task behavior: taking notes, working, listening, collaborating, and asking questions. When the 10-minute samples were analyzed for specific tasks, major differences appeared and are documented in Table 2. Three subdivisions showed dramatic differences between the settings. Note taking, peer to peer collaboration, and working showed differences of more than fourteen percentage points each. In the traditional setting, sampled students were taking notes 42.6% of the time, while sampled students in the flipped classroom setting were taking notes only 3.3% of the time; a difference of 39.3 percentage points. This difference represents a savings of more than seventeen minutes of class time. The second most significant difference between the settings, 29.6 percentage points, appeared in the subtask of working on mathematical concepts. Sampled students were working on mathematical tasks 1.3% of the time (equivalent to just over five minutes) in the traditional setting. Sampled students in the flipped environment worked on mathematical tasks 35.1% of the time (equivalent to more than fifteen minutes or three times more than in the traditional setting). The third subtask that showed a noteworthy difference was collaborating with peers. Sampled students in the flipped classroom setting collaborated with peers almost seven minutes of the period (15.5% of the time). This was 14.2 percentage points higher than sampled students in the traditional setting who collaborated with peers only 1.3% of the time (less than a minute).

Table 2. Percent of Time On-Task by Subtasks

Status	Subtasks	% of Time Traditional Setting	% of Time Flipped Setting
On-Task	Taking Notes	42.6%	3.3%
	Working	5.5%	35.1%
	Listening	32%	36.3%
	Collaborating	1.3%	15.5%
	Asking Questions	2.6%	2.2%

The quantitative data from the 10-minute engagement samples indicate that sampled students spent more time on mathematical tasks in the flipped classroom setting when compared to the traditional classroom setting. Significant differences were identified in how sampled students spent their on-task time in the two settings. Sampled students in the flipped classroom spent more time working on mathematical tasks and collaborating with peers; they also spent less time taking notes than sampled students in the traditional setting. Overall, the data reflects more and different types of engagement in the flipped classroom setting.

Qualitative excerpts from student comments completed on the open-ended survey (AY16 only) provide insight about student engagement. According to one student, “I participate more in the flipped classroom because I already understand the topic and can be more engaged in the discussions.” Another student explained, “I feel more intrigued by the lesson because I’ve had a chance the night before to get used to the concept.” Overall, engagement during class time moved

from students taking notes most of the period to applying and discussing the mathematics they learned. One student summarized this impact by stating, "I can go into class and know what people are talking about. Then I can expand on the topic."

Discussion

While these paired studies provide an interesting view into the perceptions, homework practices and classroom engagement of eighth grade students in mathematics, the studies are also limited by a number of factors. Action research is an acceptable form of teacher inquiry; however, the scope of its focus (a single classroom, a single teacher, a single approach) all serve to minimize the generalizability of the studies' conclusions. The present studies are further limited by confounding data collection schemes that changed from year-to-year. The teacher-constructed instruments (survey questions, open-ended questions, and observation form) were constructed in a collaborative manner in an attempt to increase reliability and decrease bias, but have not been subjected to intense validation protocols. The limitations of self-report data are well documented and the self-reports of eighth grade students engaged in an alternative instructional format should serve to moderate the studies' implications. Finally, using only descriptive statistics, rather than more elaborate statistical analysis, may serve to mask more accurate interpretations of the data.

At the most basic level, this mentor teacher/teacher candidates shared action research serves as an exemplary case of PDS work. The University's teacher preparation program's desire for all senior-level teacher candidates to conduct action research in their own classrooms was embraced by the PDS campus. Shared professional development established a common foundation and common language for all participants. University and campus support created a fertile environment for the examination of classroom practice. While this article reports on this singular case, similar experiences were and continue to occur in multiple classrooms on the PDS campus.

At the heart of practitioner inquiry is the impact on learners (Dana & Yendol-Hoppey, 2009). The present studies documented positive student impact in multiple areas identified by the guiding questions: students preferred the flipped classroom over the traditional classroom and identified specific positive characteristics of the flipped environment; average on-time homework submissions were high in the flipped environment; and student engagement was higher and distinctive in the flipped environment. These results are consistent with the Johns Hopkins' Center for Research and Reform in Education (CREE) report, which concluded that "higher engagement" and "increased interactions with peers" were two of six benefits of technology in the classroom (Morrison, Morrison, & Ross, 2016).

Anecdotally, these studies have been linked to gains on state administered tests. The mentor teacher and others believe the flipped classroom approach helped 12 of 14 participants, who had failed the state mathematics assessment in spring 2015 (as seventh graders), pass the state mathematics assessment as eighth graders in spring 2016. Five of those students had failed the state mathematics assessment in multiple prior years. The belief is that completing homework in a timely manner, participating in class discussions that expanded on their knowledge, and engaging in activities to apply their conceptual understandings, helped students perform better on the exam. These positive results have generated a great deal of enthusiasm for continued action research on the PDS campus.

The data have also revealed an area of concern for the campus. The on-time homework submissions for eighth grade students in regular mathematics class was substantially lower (76%)

than the on-time homework submissions for eighth grade students in pre-AP and algebra (91% and 86% respectively). This one discrepancy, essentially hidden by the descriptive statistic (average on-time submissions for all students = 86%), has generated intense questioning on the campus. What should be done when roughly one-quarter of a class arrives unprepared for the day's instruction (students who have not completed the flipped assignment at home)? Unfortunately, there is little data to support any conclusions. Eighth grade regular mathematics students were not included in the first year of the study (AY15), so there is no comparative data to identify increases or decreases. Likewise, homework submission data was not collected during the traditional classroom experience, which prevents comparison to prior behaviors.

Possible interpretations for this difference in homework submissions range widely. Some attribute the difference to intrinsic motivational differences between students who are enrolled in pre-AP and algebra classes and those enrolled in regular eighth grade mathematics. Others perceive the difference as a flaw in the flipped classroom methodology, which would require modification by the instructor. Still others perceive it as students not meeting homework expectations, which would require action from the campus administration. The lingering questions provide a catalyst for on-going inquiry.

This shared action research project also had an impact on the individuals that participated in the studies. The mentor teacher concluded, "This was definitely an experiment I'm glad I tried. I am now a firm believer in flipped learning, and will never go back to a traditional way of teaching again." The intern who participated in the AY15 study indicated he would not continue with the flipped classroom methodology. His primary concern was that it did not appear to be effective for all students. The AY16 intern who expanded the investigation to include student engagement data had a very positive reaction to the process and continues to use the flipped approach in his own classroom as a first-year teacher. The university faculty member serving as University Liaison to the PDS campus is in the midst of the discussions related to the outcomes of the studies. She is enthusiastic about the dialogue occurring around classroom practice and teacher-led investigations. The principal of the middle school made the following observation about these consecutive studies, which has "led to the 'flipping' of all four of our eighth grade math classes for this current 2016-2017 school year…action research has impacted the entire eighth grade, or approximately half of all of the students who attend our school. It can be said that the results of these action research studies have directly impacted the type of instruction delivered by our teachers, and practiced on a daily basis by our students." As a result of the growing interest in action research, a spring faculty meeting is dedicated to sharing all of the action research projects being conducted by teachers and interns on the PDS campus. These projects are also shared with a community-wide action research symposium including all of the teacher preparation program's senior-level candidates hosted by the University.

The impact of these studies is not limited to the local students, local campus, or even the local university. These studies are consistent with national research related to flipped classrooms. The Flipped Learning Network (2014) identifies four pillars of flipped learning: "flexible environment," "learning culture," "intentional content," and "professional educator." These paired studies maintain a high degree of fidelity to indicators provided by the Network. The experiment met at least one indicator in each of the four pillars. To accommodate the increased class time activity, the teacher had requested that the traditional desks be replaced by tables and chairs. This change is evidence of the flexible environment pillar and was well received; more than 70% of the students in AY15 indicated that they "like the way the classroom is set up (with tables and chairs

instead of desks)." Likewise, one of the indicators of learning culture is "in-class time is dedicated to exploring topics in greater depth and creating rich learning opportunities…students are actively involved." These studies indicated that more students were involved and that more time was spent working on and talking about mathematics during class time in the flipped setting. The third pillar, intentional content—educators "determine what they need to teach and what materials students should explore on their own," was clearly evident in the design of the flipped learning portions of the two studies. Finally, the fourth pillar—professional educator, calls for the professional to be "reflective in their practice" and to "connect with each other to improve their instruction." Both studies were conducted by a mentor teacher collaborating with teacher candidates (supported by campus administration and university faculty) to study and improve their classroom practice.

Conclusion

The twin initiatives of PDS work and action research drove this deliberate investigation of a flipped classroom approach. These collaborative studies, conducted by a mentor teacher and successive teacher candidates exemplify the work that pervaded the PDS campus. The mentor teacher embraced the teacher preparation program's challenge to model studying one's own practice. The preparation program provided requisite professional development and on-going support as both candidates and mentors embarked on self-identified investigations of their local classroom practices. The university faculty member who served as the liaison to the PDS campus also served as a key presenter in the action research training, which provided an extraordinarily supportive environment for the PDS campus.

Within this PDS structure, the mentor teacher and candidates were empowered by adoption of an action research agenda to examine the implementation of a flipped classroom environment as the campus implemented a district-wide one-to-one iPad initiative. The study examined the perceptions of eighth grade mathematics students and the on-time homework submissions as the teachers implemented a flipped classroom environment. In the second year of the study, an examination of student engagement during class time was added. Overall the results were positive, though expanding the flipped environment to a larger population of students in the second year has revealed that all students do not respond equally well to the approach. The PDS community now must address differing interpretations of and the limited amounts of data collected as it also addresses how it will respond to the questions raised by the data and its interpretations. However, this is as it should be in a professional development school—intense discussions about data, practice, and student impact.

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Appendix

Student Engagement Observation Form
(adapted from a form used in the School of Education)

Observer _____ Date _____
Campus _____ Time _____

	Setting S, G, I	Student 1	Student 2	Student 3	Student 4	Student 5	Student 6
:30							
1:00							
1:30							
2:00							
2:30							
3:00							
3:30							
4:00							
4:30							
5:00							
5:30							
6:00							
6:30							
7:00							
7:30							
8:00							
8:30							
9:00							
9:30							
10:00							

Every 30 seconds, observe each of six randomly selected students.
Observe each student for 5seconds during the minute.

Codes:

%_____+ =	On Task--following directions, looking at teacher
%_____– =	Off Task--not engaged
%_____N =	Taking notes
%_____W =	Working on assignment
%_____L =	Listening
%_____C =	Collaborating
%_____Q =	Asking questions
%_____O =	Off-task
%_____T =	Talking (not about lesson)

Student # 1: _____% on task _____% off task
Student # 2: _____% on task _____% off task
Student # 3: _____% on task _____% off task
Student # 4: _____% on task _____% off task
Student # 5: _____% on task _____% off task
Student # 6: _____% on task _____% off task
Total #1-#6: _____% on task _____%off task

Code Blue: A Lesson in Teacher Inquiry In a Professional Development School

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With

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Abstract: This article describes how a high school classroom became a true learning laboratory for participants within a Professional Development School. Specifically, the classroom served as a "hospital round," in which teacher candidates, mentor teacher, and university professor "diagnosed" a student learning issue, "prescribed" a teaching strategy, and made careful observations of the "patient" to see if the prescribed strategy was effective. This "Code Blue" lesson enabled the teacher candidates, mentor teacher, and university professor to engage collaboratively in teacher inquiry, resulting in positive professional development for all participants.

KEYWORDS: professional development school, PDS, teacher inquiry, teaching strategy, innovative practice, reflective practice

NAPDS NINE ESSENTIALS ADDRESSED:

2. A school–university culture committed to the preparation of future educators that embraces their active engagement in the school community;
3. Ongoing and professional development for all participants guided by need;
4. A shared commitment to innovative and reflective practice by all participants;
5. Engagement in and public sharing of the results of deliberate investigations of practice by respective participants
7. A structure that allows all participants a forum for ongoing governance, reflection, and collaboration;
8. Work by college/university faculty and P–12 faculty in formal roles across institutional settings;

Introduction

Imagine this scenario: It is a Tuesday afternoon in a local high school. Twenty-five 10th grade students file into a classroom and their teacher organizes the students into small groups. Just after the bell rings, the co-teacher announces, "Good afternoon! As you can see, we're going to do something a little bit different today. We're going to try discussing *Lord of the Flies* in a different way – using Literature Circles. I'm going to get you all started; then you'll get to try it out in your groups." After the co-teacher provides instructions on how Literature Circles work, the students discuss the novel in their groups with both teachers assisting, as needed. Perhaps this sounds like

a fairly typical high school English class. Except – the "co-teacher" in this scenario was a teacher education professor from the local university. Additionally, six teacher candidates were in the room, observing and taking notes on this class session. After the class ended, the teacher candidates, classroom teacher, and university professor met for an hour to discuss this teaching observation session.

This scenario describes one afternoon within a Professional Development School (PDS). The goal of this afternoon's lesson was to invite teacher candidates to help solve a real-world teaching problem through inquiry. That is, the classroom served as a "hospital round," in which teacher candidates, mentor teacher, and university professor "diagnosed" a student learning issue, "prescribed" a teaching strategy, and made careful observations of the "patient" to see if the prescribed strategy was effective. This "Code Blue" lesson mirrors the recommendation put forth by the National Association of Professional Development Schools (NAPDS, 2008), which describes the PDS as a "learning laboratory for the development of teacher candidates" (p. 5). One way to create such a laboratory experience is through teacher inquiry, in which individuals study specific instructional practices. In fact, such inquiry is considered a "signature pedagogy" of PDS partnerships (Yendol-Hoppey & Franco, 2014). In this article, we - both the mentor teacher (Jennifer) and university professor (Erinn) - will describe how our classroom became a learning laboratory. We will explain how the Code Blue lesson idea emerged, our goals for this inquiry experience, and how the experience impacted participants.

Code Blue Lesson Context

Our Code Blue inquiry lesson took place in a 10th grade English classroom within an urban high school in the southeastern United States that serves a population of approximately 1400 students annually. The school's English department is comprised of nine full-time teachers, six of whom were selected to serve as mentors to teacher candidates during the 2015-2016 academic year. At this time, the school became the pilot site for a new PDS with a local university's teacher education department. Specifically, the university's secondary English education program partnered with the high school. During this academic year, six English teacher candidates were enrolled in the program. The candidates completed yearlong field placements within the high school English classrooms and completed two methods courses on-site at the school. Their university faculty member (Erinn) was on-site at the school teaching these courses and supervising the teacher candidates' placements.

Jennifer served as one of the mentor teachers during this academic year. In spring semester, she became interested in studying her 10th grade students' engagement during close readings of rigorous texts. She invited Erinn and the six teacher candidates to engage in inquiry focused on the question, "How can we design lessons to engage students in actively analyzing and discussing a text?" To answer this question, a teaching strategy was selected, and Erinn tested out this strategy in Jennifer's classroom while the teacher candidates observed. Student artifacts (e.g., discussion handouts and text annotations) and observational data on the focus lesson were collected. These data were analyzed for emerging themes. Results from these analyses revealed that the teaching strategy did not effectively engage the 10th grade student readers; however, the inquiry experience did positively impact the pedagogical beliefs of the mentor teacher, university professor, and teacher candidates.

Code Blue in My Classroom: A Mentor Teacher's Perspective

Our Code Blue lesson experience begins with Jennifer's descriptions of her classroom situation – the factors and questions that led her to seek new methods and strategies for reaching her 10th grade students.

Students' Symptoms: Acute or Chronic Aversion to Learning?

There I was…a veteran English teacher in a new high school trying my old lessons and my worn-out ideas while the pre-service teacher I was assigned to mentor looked on (and in my eyes, I was convinced, in judgment.) The students from the high school where I worked previously were below grade level and struggling, yet I could get them to perform. But this new group was an enigma. Most students performed at grade level on standardized tests, yet I could not get anything out of them in class.

It was an outlier class—I had several other preps and only one tenth grade class. I was spending too much time prepping for the other classes and always seemed to fall short for this particular class. I was struggling to develop and define a purpose for the class. This was supposed to be a school with high standards, so should I teach more novels, or should I teach shorter texts? Should I push or coddle? I had no clue and am embarrassed to admit that my years of experience went out the window once fifth period began every day. To be clear, I take some of the blame, but not all of it. Many of the students came to me expecting to make good grades without putting forth much effort. Why weren't they performing? Admittedly something was wrong and it was time for an intervention.

Time to Call the Doctor

I'm fortunate to be in a school that partners with our local university for educational training. The university has an on-site faculty member who supervises secondary English teacher candidates and teaches methods courses on our campus. During the 2015-2016 academic year, six teacher candidates were paired with mentor teachers for a yearlong field placement. Though the candidates spent most of their placement hours within their assigned classrooms, they also observed in other classrooms. I often felt guilty when my teacher candidate came to watch in fifth period. Surely, she was not gaining anything from me. I was embarrassed at what I imagined she must have been thinking about both my class and me. That's when the idea of an intervention came to me. I needed Erinn and her teacher candidates to save me. I started to envision a true laboratory of learning.

Although my husband works in the medical field, I gleaned most of my ideas from old episodes of *Grey's Anatomy* and *ER*. I was seeking a cure for the class and dreamed of finding a miracle doctor to save it—and me. I needed an outsider to examine what was going on, to look for any and all problems that had gone unnoticed. I wanted someone to dissect my classroom management. Slice and dice my lessons. Examine the causes for their apathy. Look for symptoms. Diagnose the problem. I approached Erinn about conducting a true lab. I wanted to teach behind see-through glass while the teacher candidates observed in their lab coats, carrying clipboards and jotting down their observations. Erinn would ask them for their opinions and would guide them to the right answer. They would walk in and out, talk with the patients, and present a prognosis.

While we couldn't arrange for see-through glass or lab coats, we developed a Code Blue lesson based on a strategy the teacher candidates had learned in their methods course: tried and true Literature Circles (Daniels, 2002). In this strategy, students are assigned specific "roles" to play as they read, annotate, and discuss a text. For instance, they might play the role of "illustrator" by drawing pictures of significant images or concepts within the text. Or, they might serve as a "discussion director" by creating thought-provoking questions and guiding their peers in talking about these questions. The goal of this strategy is for students to approach reading the text from various perspectives and collaboratively analyze that task in a small-group discussion. The teacher candidates had participated in a novel study using Literature Circles in their methods class and they wanted to see the strategy used with "real" students. Erinn had observed my class several times and she agreed to lead the lesson while I assisted and her teacher candidates observed. They would sit with the students, observing how the students engaged in the Literature Circle activity, and look for symptoms and causes of the underperforming class.

Observations during Labs

Erinn began with a hook. She followed with standards. She differentiated. She did everything the way the books said to do and the way she and her teacher candidates discussed. She couldn't go wrong using Literature Circles to teach a chapter from *Lord of the Flies*! But here's what astonished me: Erinn and her teacher candidates had designed a great lesson and it wasn't working. I felt vindicated! See, it wasn't me! It's them, I could tell myself. The artsy artist drew his picture: *A pig*. The connector wrote a connection: *Boys fight today*. The quotable quoter found her favorite quote: *Sucks to your ass-mar*. The discussion director led a discussion: *Y'all, can you hurry up and finish?* One student didn't listen because he thought Erinn sounded "like a Yankee." Two students were playing footsy with each other while a teacher candidate sat at their table group! Bottom line: The lesson did not work. Erinn and I had put ourselves on display—true vulnerability—and were asking for feedback from the teacher candidates we mentored. We could no longer be seen as infallible. The lesson was a failure. And that failure is what led to the discoveries – for us and for the teacher candidates.

Code Blue: Diagnoses from Different Perspectives

Our Code Blue lesson narrative continues with each of us sharing our individual diagnoses of the inquiry experience. First, Jennifer (the mentor teacher) will share her perspective, and then Erinn (the university professor) will share her perspective.

Mentor Teacher's Diagnosis

While the Code Blue lesson was taking place, I was able to observe my classroom from a different vantage point. It certainly looks different standing in the back of the room instead of the front. I could tell Erinn was having difficulties engaging the students based on their minimal effort. I had originally surmised that I was not teaching interesting lessons, but that did not seem to be the case this time. After all, Erinn was using tried and true strategies, and the students still seemed disengaged, clearly evident from their somewhat vacant stares or off-topic chatter. I theorized what was going wrong: Erinn was attempting to teach a lesson using Literature Circles, but it had

no meaning for the students. Put simply, all of this - the Literature Circles, the past lessons, the attempts at trying to entice them with games or bonus points—all of it was, in the students' eyes, a waste of time. I put myself in their shoes and imagined what they must be thinking: Why were they drawing a picture? What were they supposed to discuss? Why were they discussing anything? In our attempt to try to draw in this apathetic group, we had tried to provide creativity and a fresh approach; however, we had failed to get them to understand the purpose, the *why*, of what they were learning, thus making *what* they did or *how* they did it rather pointless.

That's not Erinn's fault. That was my fault. I was forced to reexamine what I was teaching and what my purpose was. Why was I even teaching *Lord of the Flies t*o begin with? Don't get me wrong, I love teaching that novel, but I had not taken the time to establish the purpose of it when we began. Oh, I had thrown in the standards and I thought I had a purpose, but if I'm honest with myself, my purpose was on paper only. I had tried to tie the novel into their lives and I originally thought it carried meaning for them, so why couldn't they handle the Literature Circles? Maybe I didn't fail in making the novel relevant; maybe I failed in making those skills relevant. The students saw no purpose in leading a discussion because I had not taught them how to have a discussion or why discussions are so crucial in everyday life. I had not taught them how to be creative because I didn't think that was on my list of standards to be covered. I had taught them how to answer the questions, but I hadn't taught them how to ask questions. I was so eager to teach symbolism that I forgot to make them see why learning itself is so important. Even the best lessons are not engaging if they carry no meaning. While diagnosing the students, I was forced to diagnose myself. I had not created any meaning at all in what I was doing. And if the teacher does not understand the purpose, the students certainly don't.

After the lesson, I was eager to talk to the teacher candidates to confirm my findings. I was curious as to whether or not the teacher candidates would blame the Literature Circles strategy, the instructor, or the students' personalities for the lesson's failure? Erinn and I met with the teacher candidates for an hour to de-brief the experience and we collected their observation notes. These notes and our conversations revealed interesting insights. All of the candidates agreed that this type of observation gave them a new perspective on their students. For example, one said that she enjoyed "sitting with the students, not standing up there in the classroom and looking down on them." She explained, "It gave me a new perspective. I haven't sat with high school students since I was in high school." Sitting next to the students and seeing how they reacted to the lesson, this teacher candidate had an "aha" moment about her own role as a teacher. She noted, "When I plan lessons, I think, 'what will students think?' But, sitting there, I realized that's NOT what they think." The teacher candidates realized that when they are teaching a lesson or are assisting their mentor teachers, they easily get caught up in the "big picture" of learning. That is, they focus on the whole class and may not notice how individual students are behaving or whether individual students comprehend the content being taught. By sitting next to the students, the teacher candidates were able to hone in on individual student's questions, behaviors, attitudes, and learning – a microcosm of the classroom environment. The teacher candidates noticed that the students were writing answers on their handouts and completing the work out of compliance only – no meaningful discussion was taking place.

During our de-brief discussion, the teacher candidates next tried to determine why the Code Blue lesson was unsuccessful. Initially, they questioned the pedagogical strategy itself. The teacher candidates had enjoyed using Literature Circles in their methods course, but this strategy did not seem to work with the students. One candidate wondered if the strategy worked in methods class

because, as English majors, they just naturally connected with texts. The 10th grade students, however, may not have the same feeling. She said, "Students connect totally differently. We don't have the same life experiences as our students." She further noted, "They're searching for that mystical right answer" rather than discussing a variety of responses. The other teacher candidates agreed that the students just didn't seem to "get" this strategy.

Similar to my own diagnosis for the Code Blue lesson, the teacher candidates believed that the students needed to better understand the purpose behind using Literature Circles. The problem was not necessarily the strategy itself. As one candidate noted, "Not everyone read…not everyone wanted to talk or participate." Her peer sighed, "Yeah, and that's the core issue. What do you do? If students don't read, don't do the work? Do you let them fail? I feel like that's the essential question of teaching - how much do you hold their hands?" By observing the Code Blue lesson and sharing their observations with each other, their mentor teacher, and their professor, the teacher candidates discovered that engaging in inquiry and reflective practice moves beyond simply testing out a pedagogical strategy. It entails carefully analyzing students' "symptoms" to determine the root cause of an issue. In this case, the candidates moved beyond dissecting the instructional strategy or the lesson plan design. Instead, they critically reflected on the factors causing students' lack of engagement – the "essential questions" of teaching. They related this lesson experience to their own pedagogical beliefs, to their own roles as teachers, to their own questions about how students learn and grow. And I hope that they saw me, a veteran teacher, willing to put myself and my classroom under a microscope so that I can continue to learn and grow. Sometimes even accomplished teachers need to ask themselves questions, though we are often scared of what the answers may be. This Code Blue lesson emphasized exactly how important it is for all teachers to be fully transparent and vulnerable; for it is only through honest reflection that true development can occur.

University Professor's Diagnosis

Similar to Jennifer and the teacher candidates, I did not feel as if the teaching strategy used in the Code Blue lesson effectively engaged the 10th grade students. I also wondered if part of the lesson's outcome resulted from my role as the "guest teacher." As a university professor, I do not often have opportunities to teach in K-12 classrooms. Though I had spent weeks observing in Jennifer's classroom, I discovered that teaching the students was a different experience from simply observing them. As a result, I now better understand how my teacher candidates might feel when they are "guest teachers" in someone else's classroom. When students were off-task during my instruction, I was unsure if I should redirect them. *Was that my job? Would I be overstepping my boundaries? Should I rely on the mentor teacher to intervene?* Navigating how to manage students' behavior when you are not the "real" teacher is tricky. Jennifer and I had not discussed how we might handle behavioral issues in advance. Perhaps I assumed that the students would be attentive and participatory simply because the "professor" was teaching and they were being observed by several teacher candidates. The students were not unruly; these students were simply disengaged. And I was not sure how to handle the situation.

Next, I now better understand how my teacher candidates might feel when their "perfectly planned" lesson flat-lines. On paper and in theory, my lesson plan was solid. In reality, it did not resonate with the students. It was disheartening and frustrating. It was also good for me. This was my first year working on-site as a professor in a high school. As a former secondary English

teacher, I had spent the past eight years teaching methods courses on a university campus. I traveled out to the K-12 classrooms periodically to observe my pre-service teachers. I may have been knowledgeable in educational theories and practices, but how quickly I had forgotten what it was like to keep 25 restless students engaged and on-task. I needed a refresher.

Teaching the Code Blue lesson was a true learning experience for me—a learning experience in vulnerability. In the Code Blue lesson, I planned what I thought would be a great activity, my teacher candidates observed me, and the lesson flat-lined. I was determined to not give up. I wanted to learn from my failures. So, I agreed to be the "guest teacher" in three different classrooms later that semester. Each time, my lesson did not go exactly as planned. High school students are honest. They tell me when they don't understand my instructions or when the activity I planned is boring. They also tell me when I get it right. I worried about how the teacher candidates and the mentor teacher would perceive me as a result of the Code Blue lesson. I was supposed to be the expert, and I felt like I failed them. That failure helped me see, though, that textbook strategies need to be tested with real students. My diagnosis for the Code Blue lesson (and those subsequent lessons) is that my methods course must be rooted in ongoing inquiry. I must be willing to try, to fail, and to reflect on how to teach it better next time – those same practices I require my teacher candidates to do in my course.

Concluding Thoughts: Is There a Cure?

Finally, we conclude our narrative by sharing our collective thoughts on engaging in the inquiry process within a PDS. As a mentor teacher and a university professor, we first developed the idea for the Code Blue lesson hoping to find a "cure" for this group of tenth grade students. They were disengaged with instruction; they were off-task. There had to be a cure. We tested out a pedagogical strategy - a best practice – and it did not achieve the desired outcome from these students. While the lesson itself failed, the Code Blue session did not. By inviting the teacher candidates to participate in this experience, we modeled the process of teacher inquiry. That is, we posed the question, "How can we design lessons to engage students in actively analyzing and discussing a text?" To answer this question, we engaged in the following inquiry steps: We chose and then tested out a teaching strategy, collected student data and observational data on the focus lesson, analyzed the data, and reflected on the lesson's efficacy. Throughout our process, we worked as a team to analyze teaching effectiveness and reflected on how to improve instruction in the future. Our process mirrored the following description of teaching inquiry put forth by Yendol-Hoppey and Franco (2014), "[I]nquiry requires complete engagement as [teacher candidates] dialogue with peers, practicing teachers, and university faculty throughout the cycle" (p. 24).

In theory, engaging in teacher inquiry sounded easy. In reality—and in our "hospital round" environment—engaging in inquiry resulted in moments of uncertainty and vulnerability. In our Code Blue lesson, the teacher candidates helped plan a lesson, watched us teach the lesson, and saw that the lesson did not work. The teacher candidates also saw that we had the confidence and willingness to reflect—to figure out what went wrong and how to learn from it as opposed to taking all of the blame. As we mentor teacher candidates, we often notice that if their lessons do not go as smoothly as planned, they tend to think, *I'm a bad teacher* or *I did something wrong*. In this case, the teacher candidates saw their mentor teacher say, *I'm an experienced and confident teacher, but I need some help figuring out how to better reach this group of students*. The teacher candidates then saw their professor teach an imperfect lesson and say, *Hmmm…I'm still a good*

teacher, but something went wrong. I wonder what happened, and how can we make it work better next time?

From this experience, we realized the importance of being vulnerable, of showing our teacher candidates that we sometimes face uncertainty when making instructional decisions. As Yendol-Hoppey and Franco (2014) affirmed, "…participation in inquiry necessitates navigating in an uncertain context, unique student needs, [and] shifting questions…" (p. 24). In our case, we did not know whether our new strategy would be effective and truly meet our students' needs, but we were willing to try. Next, we realized the importance of being resilient, of showing our teacher candidates that we become better teachers by admitting our failures and learning from them. Finally, we realized the importance of being transparent and honest, of showing our teacher candidates that professional development and growth come from analyzing one's students (e.g., their learning needs, personalities, behaviors, skills, attitudes, and backgrounds), from analyzing one's resources (e.g., curricula, materials, standards, assessment data, and strategies), and from using data to make informed decisions (e.g., student responses, assessment data, and observation notes). Most importantly, we realized that the ultimate goal was not to find a cure. A "cure" implies a finite result. A perfect solution. We teach students and mentor teacher candidates. There is no perfect way for doing either task. Thus, we have learned to be vulnerable and embrace the process of asking questions together, seeking solutions together, testing those solutions together, and reflecting and learning together.

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Maryland's Journey in Creating a Culture of Teacher Inquiry Statewide

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Abstract: This article describes the way in which Maryland developed an infrastructure across the state, local school systems and higher education institution levels to create a culture of teacher inquiry in professional development schools (PDS) statewide. With a combination of reform efforts in clinical preparation and teacher inquiry, Maryland established standards and developmental guidelines for PDSs that included a cross-cutting theme of research and inquiry across all standards. Supports were developed and implemented across all stakeholder groups. The Maryland PDS Network played a key role in expanding the reach of teacher inquiry through professional development, conferences and a state requirement that all teacher candidates engage in action research or inquiry. Teacher candidates are well-prepared for recent reform efforts related to teacher evaluation including Student Learning Objectives (SLOs). Maryland representatives have shared actively in conference presentations and writing journal articles and books. This has resulted in a culture of teacher inquiry statewide that is truly a PreK-20 effort.

KEYWORDS: teacher inquiry, professional development schools, PDS Infrastructure, PDS Standards

NAPDS ESSENTIALS ADDRESSED:

1. A comprehensive mission that is broader in its outreach and scope than the mission of any partner and that furthers the education profession and its responsibility to advance equity within schools and, by potential extension, the broader community;
4. A shared commitment to innovative and reflective practice by all participants;
5. Engagement in and public sharing of the result of deliberative investigations of practice by respective participants;

Introduction

For change to occur and be implemented successfully, all partners in the process must be involved actively. Ideas for change and innovation may be identified by pioneers in the field but, without the full support of stakeholders and their involvement in implementation, true change does not become institutionalized. The successful embedding of teacher inquiry in educator preparation programs in Maryland relied on support from the Maryland State Department of Education (MSDE). The following is the story of how Maryland PreK-20 stakeholders worked together to develop, implement, support, and sustain teacher inquiry for preservice and in-service teachers statewide.

In the 1990s, pioneers in the field of action research (Cochran-Smith & Lytle, 1993; MacLean & Mohr, 1999; Miller, 2001) brought the concept and practice of teacher research to the attention of the PreK-20 educational community as a way for preservice and in-service teachers to improve their instruction to increase student achievement. Other early pioneers included the National Writing Project, which provided funding to the Maryland Writing Project for Research Institutes, where PreK-20 faculty came together across local school systems and higher education

institutions to learn about and implement action research projects. The teacher research process is embedded in the work of the classroom teacher in examining practice, collecting data, reflecting, and making changes for continuous improvement. Reflection has been a key component of educator preparation. Such reflection provides candidates with a greater understanding of how their teaching actions can be improved daily to meet the needs of their students (Hendricks, 2016; Mills, 2014: Sullivan, Glenn, Roche, & McDonagh, 2016). As terminology for this process has changed across time, the teacher inquiry process provides a structure within which reflection, focused on the needs of students and increased student achievement, can occur. (Razfar, 2011). Concurrent with the increasing use of teacher research, Maryland was in the process of closely examining clinical experiences for teacher candidates, particularly in Professional Development Schools (PDSs). This emphasis on action research and inquiry along with PDS created a perfect storm for Maryland to link the two reform efforts and institutionalize them statewide.

The teacher inquiry and PDS movements began on separate paths. In 1995, Maryland embarked on a major reform effort for teacher preparation programs that resulted in massive changes for state-approved initial preparation programs (Maryland State Department of Education and Maryland Higher Education Commission, 1995). Again, pioneers in the field of clinical practice (Holmes Group, 1986; Darling-Hammond, 1994) brought forward the importance of meaningful experiences for teacher candidates in PreK-12 schools. Maryland's reform initiative included the requirement that all initial preparation candidates be prepared in a specially designed PDS. As with all new initiatives, funding is essential for establishing an infrastructure and requirements. In the case of PDS, small state grants and a significant federal grant provided needed funds to develop standards and indicators for PDS. Based on the work of the National Council for Accreditation of Teacher Education (NCATE) standards (NCATE, 2001b), and with the assistance of Dr. Lee Teitel who worked with PDS at University of Massachusetts and NCATE (Teitel, 2003), Maryland took the NCATE PDS standards and specified them to reflect state reform initiatives.

Combining representatives from the PreK-20 community in workshops, summer institutes and final pilot testing and revision, Maryland identified five standards for PDS: Learning Community, Collaboration, Accountability, Organization, Roles and Resources, and Diversity and Equity. In addition, the PDS community identified four cross-cutting themes: Teacher Preparation, Continuing Professional Development, Research and Inquiry, and Student Achievement. Thus, teacher inquiry was required to be embedded across all standards and indicators. These standards and indicators serve as a guide for the implementation of teacher inquiry in PDS and as a measure used in state program approval to determine the developmental level of a PDS. By including Research and Inquiry as a critical component for each of the standards, Maryland showed its commitment to the concept and implementation of teacher inquiry.

Establishing the Culture

To produce systematic statewide change, Maryland engaged in the development of a manual to guide the implementation of PDS (Maryland Partnership for Teaching and Learning K-16, 2003), as well as a framework for assessment to be used in state program approval (Maryland State Department of Education, 2007). These documents provided an infrastructure that allowed for development of common understandings about teacher inquiry across local school systems and higher education institutions. Since Research and Inquiry became a requirement for all candidates in Maryland teacher preparation programs, it was essential to develop and implement supports to

guide the process. To ensure the successful infusion of teacher research and inquiry into preparation programs, supports were provided at various levels: state, local school systems, and higher education institutions. Implementation of these initiatives occurred concurrently and representatives from each stakeholder group participated. Since Maryland has a tradition of collaborating across higher education, local school systems and schools, leaders in action research and teacher inquiry willingly shared their expertise with others. Necessary inquiry training for interns, school faculty, and higher education faculty fostered this collaboration. All initial preparation programs in Maryland were involved in this work.

At the state level, state representatives worked closely with both local school systems and higher education institutions to encourage and support their work. Regional meetings sponsored by MSDE provided an opportunity for PreK-20 practitioners to share best practices related to specific topics such as action research and inquiry. One mechanism for bringing the community together around teacher inquiry is an annual state conference supported by the Maryland PDS Network, which has had a focus on teacher inquiry since its inception. The conference is hosted at various institutions, and planned and implemented by representatives of local school systems and higher education. Keynote speakers have included nationally recognized experts in action research, whose work was shared with conference attendees (Sagor, 2005). These collaboratively planned and attended conferences have become a venue for sharing teacher inquiry, particularly by interns.

The annual PDS Network Conference promotes the culture of teacher inquiry because it serves as a vehicle for sharing the research and inquiry projects that occur in classrooms and schools. The conference demonstrates that Maryland provides a venue for sharing research and inquiry projects because such efforts produce valuable insights into interns' classroom practices. This annual conference attracts over 200 attendees each year. Beginning with a focus on sharing findings of research and inquiry from PreK-20 faculty and administrators, the conference has grown to include an opportunity for interns from preparation programs across the Maryland area to present their action research, inquiry or student impact studies in an Intern Gallery Walk, a highlight of the conference. Some higher education institutions require their candidates to advance their individual inquiry activities toward a process of sharing knowledge and insights with other stakeholders. Some interns also present their work at national conferences (e.g. National Association for Professional Development Schools (NAPDS) conference).

Maryland has cultivated a community of learners and leaders in teacher inquiry. With the growth of teacher inquiry in Maryland, expertise has been demonstrated in local and national conference presentations and written journal articles and books (Garin, 2014; Garin, Taylor, Madden, Beiter, Davis, Farmer, & Nowling, 2015; Jack & Rorke, 2014; Levy & Siers, 2014; Pelton, 2010; Pelton, 2010) focused on the action research process. PreK-20 representatives from Maryland have provided significant support and leadership for NAPDS leadership and publications. Many Maryland faculty and administrators were significantly involved in the development of NAPDS as founding members and contributed to the development of the Nine Essentials (NAPDS, 2008). Three Maryland representatives, of both local school systems and higher education institutions, have served as President of NAPDS, with others serving in other leadership and board positions. Maryland representatives are major supporters and implementers of the NAPDS publications, taking what they have accomplished and sharing that expertise with others.

In addition to involvement with NAPDS, Maryland representatives have served in leadership capacities provided by the American Educational Research Association (AERA)

including special interest groups related to both PDS and teacher inquiry. This national and international involvement has provided multiple opportunities to learn from the work of others, thus enriching an understanding of both PDS and the importance of teacher inquiry in PDS implementation.

At the higher education level, with all teacher candidates required to engage in action research or inquiry, institutions needed to examine their curriculum to determine where action research or inquiry would be placed in a candidate's experience. This involved training for both faculty and candidates in the action research process. What began as a major effort to familiarize participants is now a commonplace expectation. In addition to requiring candidates to complete action research or inquiry projects, higher education institutions provide opportunities for candidates to share their results at the department, school, and local school system level. Higher education institutions are able to foster collaboration with their PreK-12 partners by involving them as assessors of the action research or inquiry projects.

At the local school system level, school faculty and administrators realized the importance of action research for their in-service teachers. Local school systems recognized the importance of action research in its early stages, some hiring full-time specialists who provided professional development and support for faculty. When action research became a requirement for interns, this required training in the action research process for mentors. At times, interns were more aware of action research than their mentor teachers. Some mentors required persuading before allowing interns to conduct action research in their classrooms. Significant issues surrounding the concept of "research" needed to be clarified to orient in-service teachers to the idea of implementation. Upon clarification, mentors understood that the steps in action research were the steps they used, each day, to identify a question about their practice, make modifications, examine results, and determine ways to move forward. In these efforts, Maryland PreK-20 practitioners provided the training within and among their own institutions and local school systems.

Some local school systems have Intern Gallery Walks that include representatives from a number of higher education institutions. Gallery Walks include action research, teacher inquiring, and student impact studies. Recent events have included the participation of hiring representatives who could offer contracts during the Gallery Walk.

Evolving Implementation

With increasing emphasis on the evaluation of teachers using performance-based measures, Maryland adopted the use of Student Learning Objectives (SLOs) as a significant piece of the statewide teacher evaluation system. Using the action research process as a guide, the employment of SLOs provides validation for early implementers of an inquiry stance, underscoring the importance of data collected by teachers in their own classrooms. (Cochran-Smith & Lytle, 2009). While this change was disconcerting for many teachers, teacher candidates and interns were well prepared to engage in the SLO process, as it mirrors the action research process. Local school systems and higher education institutions are working together to ensure their interns are prepared for the teacher evaluation process they will encounter once employed. Teacher Inquiry continues to evolve in professional development and the increasing importance of reflection based on data.

Conclusion

Why is the PDS model so appropriate for teacher inquiry? PDS, at its core, is about the community of learners, increasing competency and sharing across traditional boundaries of higher education institutions and PreK-12 schools. In PDS, this distinction is one that values the work of both entities, learning with and from each other. Teacher inquiry spans all of the Maryland PDS standards.

Teacher inquiry is a thread that runs through all Maryland PDS Standards. Teacher inquiry is both an individual and community endeavor, represented within a *Learning Community*. Preservice and inservice teachers engage in teacher inquiry in their classrooms in order to examine and improve their practice. While this is helpful to them, teacher inquiry should also be a community activity where groups of interns, faculty, and administrators share the results of their individual work. This *Collaboration* enriches the inquiry process. Maryland's infrastructure provides guidelines for *Accountability* for interns and PreK-20 practitioners by requiring all interns to complete inquiry projects. Maryland has created guidelines for *Organization, Roles and Resources* to ensure that all who are involved recognize their part in the teacher inquiry process, including sharing results with other practitioners. At the center of teacher inquiry are the students who represent a diverse population whose needs can be identified and addressed in relation to the *Diversity and Equity* standard.

The most significant result of this purposeful focus on teacher inquiry has been the development of a culture of inquiry across Maryland, where stakeholders are speaking the same language and are deeply involved in the reflective process. The development of this culture of inquiry was made possible not only by the collaborative work of the PreK-20 stakeholders, including interns, but also by putting in place an infrastructure that supported this cross-boundary culture of inquiry.

This process can be replicated within and among the school, school system, and higher education levels. Essential to creating this inquiry stance is advanced planning about what infrastructure is required to foster a culture of inquiry. Making teacher inquiry a requirement for interns expands to mentors and higher education faculty who become part of the process. School and higher education faculty leaders in teacher inquiry should be identified and trained to begin the process. If teacher inquiry is a new concept, there should be enthusiasm about how engaging in this process is personally and professionally beneficial. Providing clear expectations for interns, mentors, and university supervisors eliminates frustration that can occur. Building in time for reflection and sharing is essential to make engaging in teacher inquiry a meaningful experience that will continue past the requirement stage.

The teacher inquiry process is a process through which interns, mentors, and higher education supervisors collaborate in making connections to everyday practice in schools in a meaningful way. As always, celebrating accomplishments and establishing ways in which the conversation can continue so an inquiry project is not just a one-time experience, but the beginning of the development of a culture of practice.

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Teacher Inquiry and Clinical Partnerships Help Transform Teacher Preparation

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Abstract: This article focuses on the benefits of teacher inquiry and strong clinical partnerships at the core of clinically rich educator preparation. The work of the AACTE Clinical Practice Commission provides a foundation for the fusion of theory and practice to enhance teacher candidate professional growth while bridging university and school based contexts to establish a model of deeply embedded clinical practice. Implications for teacher education programs, partnership development, and P-12 student learning are provided.

KEYWORDS: teacher inquiry, reflection, clinical practice, partnerships, PDS, professional development schools

NAPDS NINE ESSENTIALS ADDRESSED:

1. A comprehensive mission that is broader in its outreach and scope than the mission of any partner and that furthers the education profession and its responsibility to advance equity within schools and, by potential extension, the broader community;
2. A school–university culture committed to the preparation of future educators that embraces their active engagement in the school community;
3. Ongoing and reciprocal professional development for all participants guided by need;
4. A shared commitment to innovative and reflective practice by all participants; and
5. Work by college/university faculty and P–12 faculty in formal roles across institutional setting.

Introduction

The purpose of this article is to share the efforts set forth by the American Association for Colleges of Teacher Education's Clinical Practice Commission (CPC) to provide a strong voice for clinically rich educator preparation. The work of the CPC represents a wide spectrum of educators, including but not limited to: PK-12 teachers and administrators; university deans, faculty, and staff involved in teacher preparation with clinical field components; and representatives from several national associations for education. With a broad representation, the CPC aims to take a professional position to establish a vision for unifying the profession by identifying a set of core tenets required for educator preparation programs engaged in clinically rich practices. The authors, members of the CPC themselves, provide a brief historic

overview of the development and work of the CPC. Next, we offer an analysis of the importance of embedded clinical practice that bridges the dichotomy of university and P-12 school based contexts as well as the fusion of theory and practice to enhance teacher candidate professional growth. We focus on the importance of identifying a set of core practices that teacher education programs should embrace while focusing specifically on teacher inquiry as a critical component at the core of teacher education. We conclude with implications for the field for teacher education, the impact on developing partnerships to embrace clinically rich practice, and the importance of this model for P-12 student learning.

AACTE's Clinical Practice Commission

In 2015, the American Association of Colleges of Teacher Education (AACTE) created the CPC in an effort to define clinically rich practice for all parties involved in the preparation of new teachers. Strong leadership from both PK-12 school and university partners was critical to this dialogue and the development of a common understanding of clinically rich educator preparation as a unified PK-20 voice. Representation from various professional education associations across the country, including the National Network for Educational Renewal, National Association for Professional Development Schools, National Board for Professional Teaching Standards, Association for Teacher Education, and the Council of the Accreditation of Educator Preparation (CAEP) State Alliance teams, were essential to establishing a shared vision for the profession, for unifying the field, and ultimately for elevating the professional status of the teacher workforce.

In 2010, the National Council for Accreditation of Teacher Education (NCATE) commissioned the *Report of the Blue Ribbon Panel on Clinical Preparation and Partnerships for Improved Student Learning*. This report called for teacher education to be "turned upside down" moving away from a central emphasis on college coursework and moving towards programs more aligned with clinical practice as the focus:

> "...prospective teachers must be prepared to become expert practitioners who know how to use the knowledge of their profession to advance student learning and how to build their professional knowledge through practice. In order to achieve this we must place practice at the center of teaching preparation" (NCATE, p. 2).

The CPC was charged with revisiting this report and providing an action-oriented blueprint for implementing the recommendations. Thus, the CPC set out to first define "clinically rich practice" as a common denominator for educator preparation programs. Subsequently, the CPC would identify and highlight exemplary programs around the country and develop a set of indicators for high quality, clinically rich educator preparation programs as a way to upraise the profession. Thorpe (2014) asserts:

> Teachers, administrators, and others whose work is designed to support best practice in our schools must seize this moment to rethink every aspect of the trajectory people follow to become accomplished teachers. Getting that path right and making sure all teachers follow it asserts the body of knowledge and skills teachers need and leads to a level of consistent quality that is the hallmark of all true professions. (p. 1)

The CPC's collective voice asserted the need for action, not another document that would sit on a shelf awaiting a future educational reform effort for educator preparation. Our "call to action" began with a focus on consistency for the field in the form of a common lexicon (or vocabulary)

that would eliminate the fragmentation of the field through improved articulation of the roles of individuals engaged in clinically based teacher education.

A Common Lexicon for Clinical Practice

Along with identifying and recommending a blueprint for clinical practice, the CPC recognized the need for a common lexicon for the field along with pathways to operationalize their recommended blueprint. Upon further investigation, members of the CPC discovered much confusion within the field regarding the terminology used (Zenkov & Parker, 2017). This was especially true for the roles of individuals engaged in clinical practice, including teacher educators and the status of teacher candidates at different stages of development. For example, a university student in a teacher preparation program might be referred to as a student, practicum student, student teacher, teacher candidate, clinical intern, etc. depending on the status in their program or the institution in which they are enrolled. Below, we share five of the core terms as identified and defined by members of the CPC that we feel are central to the role of teacher inquiry in PDS partnership models (Zenkov & Parker, 2017):

School-Based Teacher Educator- Individuals involved in teacher preparation whose primary institutional home is a school. *School Based Teacher Educators* are a specific type of *Boundary Spanning Teacher Educators* who assume mentoring and partnership responsibilities that are in addition to their school responsibilities. This subsumes the terms university liaison, site facilitator, cooperating teacher, mentor teacher, collaborating teacher, and school liaison.

University-Based Teacher Educator- Individuals involved in *Teacher Preparation* whose primary institutional home is a college or university. *University Based Teacher Educators* are a specific type of *Boundary Spanning Teacher Educator* who engage in evaluation, coaching, instruction, and partnership and assume expanded and multiple responsibilities within, and often across, each of these four domains. This subsumes previously used terms such as university supervisor, university liaison, clinical supervisors, and clinical faculty.

Mentor Teacher- A teacher, identified as an exemplar and formally prepared as a clinical practitioner, who serves as the primary *School Based Teacher Educator* for teacher candidates completing clinical practices or an internship.

Teacher Candidate- An individual formally admitted to an accredited teacher preparation program that leads to teacher licensure.

Clinical Coaching- Clinical Coaching represents the bridge between the work of *University Based* and *School Based Teacher Educators* engaged in teacher preparation and the practices in which these individuals engage. This term subsumes supervision and mentoring.

Members of the CPC feel strongly that a common lexicon would be the first step toward uniting the profession and helping to define clinically rich educator preparation for the future of the field.

Clinically Rich Educator Preparation

The final charge of the CPC was to identify pathways to clinically rich educator preparation. Although the CPC does not endorse a single avenue to clinically rich practice, the

Professional Development School (PDS) model as defined by the National Association for Professional Development Schools (NAPDS) is one avenue of programming that encourages school based teacher educators and university based teacher educators to develop structures that not only work to create a "comprehensive mission broader in its outreach and scope than the mission of any partners" (NAPDS, Essential 1) but also works to create "a school-university culture committed to the preparation of future educators that embrace their active engagement in the school community" (NAPDS, Essential 2). The NAPDS Nine Essentials provides a list of indicators that are used to help guide PDS work (NAPDS, 2008). Other important indicators related to our work include "ongoing professional development for all participants" (NAPDS, Essential 3), "shared commitment to innovative and reflective practice" (NAPDS, Essential 4), and "work by college/university faculty and P-12 faculty in formal roles across institutional settings" (NAPDS, Essential 5). PDS Partnerships encourage the types of reciprocal relationships that must exist in order to create clinically rich educator preparation that connects content, pedagogy, and clinical practice as well as supporting the development of teacher inquiry and reflection.

Bridging Theory to Practice and School/University Dichotomies

Teacher preparation programs that embed clinically rich practice, like those found in PDSs, naturally bridge the university and P-12 contexts. Clinical coaches and mentor teachers alongside university based and school based teacher educators work together to guide and support teacher candidates as they develop professional and pedagogical knowledge and shape their professional dispositions (Shulman, 2005). As a profession, it is imperative that an agreed upon set of core practices be identified and triumphed by the field that are central to all teacher education programs in order to help diminish some of the challenges that many teacher candidates face as they straddle the theory to practice dichotomy. This dichotomy is described by Lampert (2010) with a mind/body analogy in which *theory* is relative to *thinking* and *practice* is relative to *action*. On the contrary, deeply embedded clinical experiences focused on core practices that include high leverage habits leading to engaged learning alleviate this dichotomy. The creation of boundary spanning, nurturing environments that incorporate core practices helps deepen teacher candidate professional knowledge (i.e. the act of thinking) while developing pedagogical knowledge (i.e. the act of doing) resulting in a seamless transition between university and school based contexts.

Through clinical practice, teacher candidates can discover more about student learning and the science of teaching by utilizing three key concepts related to pedagogical practice as identified by Grossman and colleagues (2009):

1. *Representations of practice* comprise the different ways that practice is represented in professional education and what these representations make visible to novices;
2. *Decomposition of practice* involves breaking down practice into its constituent parts for the purposes of teaching and learning; and
3. *Approximations of practice* refer to opportunities to engage in practices that are more or less proximal to the practices of a profession. (pp. 2055-2056)

This approach to clinical practice guides teacher candidates as they bridge the theory to practice dichotomy supervised by their university and school based teacher educators as they directly apply pedagogical methods within the context of a clinical experience. Teaching and learning as well as

explicit and implicit impact on P-12 students is at the forefront of their practice under the guidance of the mentor teacher. As a result, teacher candidates become more knowledgeable, decisive, and reflective in the process (Cochran-Smith & Villegas, 2015).

Finally, the CPC identifies a set of core practices that align with the Professional Development School (PDS) model and combines Hollins (2011) epistemic practices of focused inquiry, directed observation, and guided practice. These core practices include: 1) focused observation, 2) coaching, 3) co-teaching, 4) direct dialogue, 5) inquiry, and 6) reflection on teaching (Yendol-Hoppey & Franco, 2014). Not only do these pedagogical practices support teacher candidate learning, but they also embrace a cyclical process of research, implementation, and reflection, referred to as teacher inquiry (Dana & Yendol-Hoppey, 2009). For the purpose of this article, we focus specifically on the interplay between teacher inquiry and reflection on teaching at the core of teacher candidate learning within clinical practice.

Teacher Inquiry and Reflection in Clinical Practice

The CPC's work involves a particular research paradigm, *teacher inquiry*. Teacher inquiry can be viewed as "how teachers make explicit and prove further their wonderings, reframe and modify their questions and enlighten their perceptions and sense-making of their classroom practice" (Dana, Gimbert, & Silva, 2001, p. 51). Although this may sound similar to teacher reflection, they are not synonymous. Rather, reflection is an intricate part of the teacher inquiry cycle and not the whole process in and of itself. Some distinctions exist between inquiry and reflection. First, reflection is something teachers do without planning. It becomes second nature to teachers to consider how well a lesson was delivered, how the students responded, and what could be improved. Sometimes, reflection may not occur unless a problem exists during the learning process. This may all happen without scheduling time in their day to do so; it is more whimsical in nature. In contrast, inquiry is much more intentional (Dana & Yendol-Hoppey, 2009). Teacher inquiry is a deliberate process that involves homing in on an identified focus question or challenge within the context of one's classroom. The act of identifying a question or challenge provides a pre-existing condition to probe. It allows the teacher as researcher to consider aspects of the teaching and learning process prior to teaching. Because the teacher acts as researcher, inquiry is quite "intentional, critical, and systematic" (Dana & Yendol-Hoppey, 2009, p. 4).

Second, teacher inquiry is more transparent and accessible than reflection. Reflection is an internal cognitive process that cannot be measured by the naked eye. Teacher inquiry is made available for in-depth pondering and engaged conversations among educators as a mechanism for shared "diagnoses" through collective experiences. Also referred to as focused inquiry (Hollins, 2011), the process begins with the teacher identifying a specific classroom dilemma. The problem is investigated through direct observation of students actively involved in the learning process. The teacher then analyzes the learning process of the students, including student reactions, questions, and sample work. Not only do teachers seek to find root causes of the identified challenge, they use it to cultivate a deeper understanding of its impact to the teaching and learning process (Hollins, 2011). The critical analyses are then used to inform the next action step or a change in the pedagogical approach.

Teacher reflection, on the other hand, is viewed as a practice embedded in a larger process (Hoffman-Kipp, Artiles, & López-Torres, 2010). In this case, reflection occurs throughout the cyclical inquiry process described above. While teacher inquiry is the process of analyzing a

situation, setting goals, planning and monitoring actions, and evaluating results, teacher reflection focuses on one's own professional thinking in which an individual "considers the immediate and long-term social and ethical implications of their decisions" (Colton & Sparks-Langer, 1993, p. 45). It is reflective practice that engenders personal and social values, critical stance, and draws on life experiences aligned to one's own consciousness and social responsibility that impact teaching decisions. Working in concert, teacher inquiry and reflection help teacher candidates systematically and intentionally study their own practice while considering how their pedagogical actions align with their own values and awareness of social responsibility as a teaching professional.

Embedding teacher inquiry throughout teacher preparation programming requires clinically based programs to re-examine their curriculum. Helping teacher candidates and teacher educators develop an "inquiry stance" requires inquiry practice to be woven throughout clinical experiences. For example, Pennsylvania State University and their PDS collaboration with the State College Area School District requires teacher candidates to engage in a formal inquiry project during a year-long clinical placement in a partnership school. Mentor teachers participate in the inquiry project as they support the work of their teacher candidate (Burns, Yendol-Hoppey, & Jacobs, 2015). Programs such as this one can serve as exemplar models to programs looking to infuse inquiry into their own curriculum and further emphasize "a shared commitment to innovative and reflective practice by all participants" (NAPDS, Essential 4) associated with a PDS partnership model for clinical practice.

Value of Inquiry for Clinically Rich Teacher Education

The value of teacher inquiry as a core practice for clinically rich educator preparation is that the teacher is respected as an expert in his or her profession. "Outsiders" have been the engineers of the curriculum train where teachers are told not only what to teach but *how* to teach, via compliments of politicians, publishers, external researchers, and others who may not have a background in education. Teachers are the best informants of classroom pedagogy because they are in the trenches of the 21st Century classroom. Through teacher inquiry, their voices are no longer muted as they are given a vocal platform to inquire, analyze, and discuss their findings with others in the education profession. To separate inquiry from teaching implies that the old adage by George Bernard Shaw (1903) is correct: *"He who can, does; he who can't, teaches*" (n.p.). Inquiry combats this motto that criticizes the teaching profession and protects the integrity of the science of teaching (i.e. pedagogy) as well as the complex nature of learning contexts. Thus, teacher inquiry allows for professional growth for both the teacher candidate and mentor teacher.

Teacher educators working alongside mentor teachers and clinical coaches engage in professional development related to teacher inquiry to ensure proper implementation and understanding of the inquiry process. Thus, the collaboration between university and school based teacher educators is essential to the inquiry process as "practitioners clarify the goals and actions of inquiry and validate their activities in the eyes of others" (Díaz-Maggioli, 2004, p. 72). This strategy provides opportunities for professional growth that is embedded in clinical practice as a model for teacher candidates who will benefit from various viewpoints as well as providing "ongoing and reciprocal professional development for all participants guided by need" (NAPDS, Essential 3). If true professional growth is to take place, teachers must inquire about their own practices, pushing the limits of improving their craft, and taking a professional stance. Viewing

the process of teacher inquiry as professional development in and of itself is a modernized way to give teachers opportunities to learn and grow within the context of their own classroom. This can be achieved through clinical practice in which a climate of support is developed for both the teacher candidate and mentor teacher (Danielson, 2011). A PDS model offers that climate of support.

When an educator preparation program provides clinically rich experiences that involve teacher inquiry, it is an opportunity for simultaneous renewal for the mentor teacher and teacher candidate. It becomes a collective endeavor to pursue questions about effective pedagogical practices within the classroom. Together, the teachers problematize their questions through collaborative instructional planning to ensure the desired outcome: reaching each and every student in the classroom. The process of teacher inquiry helps to inform the teaching and learning community, how one's own practice impacts the P-12 learner, and as a result, provides Educator Preparation Programs the opportunity to make necessary changes to strengthen their clinical programs. In this scenario, the teachers (both mentor and candidate) benefit by being able to apply the in-depth knowledge gained from inquiry to their future practice to continue their own professional growth and more effectively address the needs of all students through increased levels of differentiated instruction.

Benefits of Clinically Rich Teacher Education

We conclude with implications for teacher education programs, PDS partnerships, and the importance of this model for impacting P-12 student learning. Regarding teacher education programs, teacher inquiry provides opportunities for university-based teacher educators to work closely with school-based teacher educators to identify problems of practice and provide increased support for teacher candidates. Teacher candidates further develop pedagogical and professional knowledge as they engage in active teacher inquiry guided by school-based teacher educators, an important skill to develop before moving into their own classrooms. Teacher candidates also benefit from deeply embedded clinical practices that lend themselves to the acquisition of authentic inquiry experiences alongside experienced mentor teachers and university-based teacher educators to bridge the theory to practice dichotomy where practitioner and academic knowledge intersects (Gutiérrez, 2008; Zeichner, 2010). Opportunities for teacher candidates to explore the contextual factors of a school community through in-depth analysis and discovery also supports active engagement in and commitment to the school community (NAPDS, 2008).

The role of teacher inquiry in PDS partnerships focuses specifically on clinically rich practice and provides articulated benefits for all participants. Russell (2006), a staunch advocate of reflective practice, asserts that "reflective practice can and should be taught" through explicit strategy instruction during teacher preparation (p. 199). Professional partnerships provide the avenue in which reflective practice and teacher inquiry can best support deeper learning of pedagogy and the impact of contextual factors within instructional settings as "college/university faculty and P-12 faculty work together across institutional settings" (NAPDS Essential 5). Teacher candidates who engage with inquiry and professional discourse indicate they "no longer expected easy answers to their questions but expected questions to generate deeper understanding and lead to more inquiry" (Rath, 2002, p. 159).

Integrating teacher inquiry into a teacher education program provides opportunities to further develop and strengthen partnerships while operationalizing the concept John Goodlad

describes as simultaneous renewal (1999) in which partnerships should be deliberate, co-constructed, and mutually beneficial (CAEP, 2013). Thus, a conceptual framework with clinical practice at the core is imperative for teacher candidates to engage in authentic clinical experiences that are reliant on deeply established P-20 partnerships. Through simultaneous renewal, clinical settings benefit from a collective body of knowledge focused on problems of practice from multiple perspectives and a shared responsibility for the inquiry process while teacher education programs gain insights for program improvement directly from experiences within clinical environments.

Finally, the integration of teacher inquiry into the teacher preparation curriculum can have a positive impact on PK-12 student learning in several ways. As previously discussed, a system of shared responsibility is present to identify and solve instructional challenges or problems of practice from multiple perspectives within the context of the instructional environment. Opportunities for increased levels of differentiated instruction as one outcome of teacher inquiry helps meet the needs of all students. Finally, as teachers are inducted into the profession, they have attained increased levels of pedagogical and professional knowledge as well as experiences with teacher inquiry through clinical practice to better meet the needs of their future student

Author's Note: The content of this article is reflective of the collective body of knowledge of the members of the AACTE Clinical Practice Commission (est. 2015).

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