School–University Partnerships

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.

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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. Please refer to the submission guidelines at the back of this issue for advice to aspiring authors.

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The Impact of Teacher Leadership on Student Learning in Professional Development Schools (PDS): Action Research is Important

Jana Hunzicker, Bradley University

Abstract: Action research improves teaching practice, builds teacher leadership skills, and supports student learning. Moreover, professional development schools (PDS) and other school-university collaborations are positioned to provide built-in guidance and support for P-12 teacher-researchers. This article provides an overview of 12 action research projects that comprise the special issue of *School-University Partnerships* themed "The Impact of Teacher Leadership on Student Learning in Professional Development Schools." The themed issue provides action research models and inspiration for teacher-researchers, a starting point for teacher leaders and college/university faculty, and impetus for writing up action research for scholarly presentation and publication.

KEYWORDS: *action research, teacher-researcher, teacher leadership, professional development schools (PDS), student learning*

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 reciprocal professional development for all participants guided by need
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For the past 40 years, teacher leadership has been conceptualized as teachers working together to positively influence teaching and learning for the benefit of students (Katzenmeyer & Moller, 2009; Lotter, Yow, Lee, Zeis, & Irvin, 2020; Nelson, 1980; Silva, Gimbert, & Nolan, 2000). Even so, in 2004 York-Barr and Duke reported that very few empirical studies of teacher leadership conducted between 1980 and 2004 robustly supported the positive effects of teacher leadership on student learning. Twelve years later, Wenner and Campbell (2016) reported that between 2004 and 2013 no research on teacher leadership examined the impact of teacher leaders on student learning. Much is known about the positive influence of teacher leadership on teachers, but research is desperately needed to document the impact of teacher leadership on students (Sugg, 2013; Wenner & Campbell, 2016). Professional development schools offer a great place to begin.

Teacher Leadership, Student Learning, and Professional Development Schools

By definition, professional development schools (PDS) are school-university partnerships that support four core practices: teacher preparation, professional development, inquiry and

research, and student learning (Holmes Group, 1986, 1990). Similar to the need for teacher leadership research, PDS advocates are calling for more outcomes-based research focused on the core practice of student learning (Ferrara, 2014; Field, 2014; Neapolitan & Levine, 2011). The ASCD Whole Child Initiative defines *student learning* as "achievement and accountability that promotes the development of children who are healthy, safe, engaged, supported, and challenged" (Varlas, 2008, Defining Full-Service Community Schools, para. 2). Because professional development schools "prioritize teacher learning and leadership, model innovation and best instructional practices, and support the pursuit and dissemination of educational research and other scholarly work" (Hunzicker, 2018, p. 33), they provide comprehensive research settings for both the study of teacher leadership and the study of student learning.

In professional development schools, *teacher leadership* is defined as "a strategic, process-oriented stance motivated by deep concern for students and activated through formal, informal, and hybrid leadership roles that span the boundaries of school, university, and community" (Hunzicker, 2018, p. 24). Because professional development schools encourage "dense and inclusive distributed-leadership practice," they are likely to house a higher percentage of teacher leaders, which in turn increases the likelihood of positive impact on student learning (Fulmer & Basile, 2006, p. 144). One way teachers in professional development schools exercise teacher leadership is through action research.

Action Research and Professional Development Schools

Action research "focuses on the concerns of teachers, rather than outside researchers, and provides a vehicle that teachers can use to untangle the complexities of their daily work" (Jacobs & Yendol-Hoppey, 2014, p. 304). The primary purpose of action research is for teachers themselves to gather meaningful data that they can use immediately to inform their teaching practice for the benefit of students. Developed for use in P-12 (pre-school through high school) classrooms, action research is based on three assumptions: (a) educators work best on problems they identify for themselves; (b) educators become more effective when they examine, assess, and modify their own teaching practice; and (c) educators help one another through collaboration and sharing (Borg, 1992; Watts, 1985).

Classroom teachers are well-positioned to conduct student-focused action research because they know their students well and care about their students' academic success and social-emotional well-being (Badiali, 2018; Garin, 2016). For example, one PDS teacher's classroom-level effort to de-track ninth grade algebra courses eventually resulted in school-wide and later district-wide implementation (Jeffries, 2018). Moreover, when classroom teachers engage in collaborative professional activities such as action research, they develop leadership skills and often emerge as leaders (Hunzicker, 2012: Lotter et al., 2020). Specifically, teacher engagement in research encourages teachers to lead with literature, from data, through sharing, and by example (Wolkenhauer, Hill, Dana, & Stukey, 2017).

Various action research models exist. The process typically involves six steps: 1) identifying the problem and articulating research questions; 2) gathering data; 3) interpreting the data; 4) acting on the evidence; 5) evaluating the outcome(s) of changes made; and 6) identifying new questions (Ferrance, 2000). In professional development schools, the core practices of teacher preparation, professional development, inquiry and research, and student learning can be realized

through action research projects. For example, in one professional development school, pre-service teachers conducted classroom-level action research projects to strengthen their teaching practice and increase student learning (Shanks, Miller, & Rosendale, 2012). The opportunity to integrate the four PDS core practices into the action research process further distinguishes professional development schools as ideal settings for studying the impact of teacher leadership on student learning.

Action Research, Teacher Leadership, and this Themed Issue

In addition to conducting action research to grow professionally and to improve or enhance student learning, teachers conduct action research to advance the teaching profession (Garin, 2016; Johnson, 1995). But for action research to have the greatest impact, it must be shared with others (Field, 2018). Indeed, action research becomes an act of teacher leadership when the research process is led by teachers and/or when the research findings are presented or published so that others may benefit (Smeets & Ponte, 2009; Wolkenhauer et al., 2017).

This themed issue of *School-University Partnerships* encourages teachers in professional development schools and other school-university partnerships to demonstrate teacher leadership by conducting action research projects designed to improve the quality of P-12 student learning experiences and/or increase P-12 student achievement and share the findings with others in the form of a scholarly article.

Overview of Action Research Projects

In keeping with the four core practices of PDS (Holmes Group, 1986, 1990), this themed issue is organized into four sections. Section I highlights teacher preparation. In the article "Converse, Diverse, Immerse: A Comparative Analysis of Teacher Candidates doing Action Research in Professional Development Schools (PDS)," Nettleton and colleagues compare the professional skill development of undergraduate teacher candidates who did and did not participate in action research as part of their PDS teacher preparation programs. In "STEM Teaching and Teacher Retention in High-Need School Districts," D'Amico and colleagues report on an action research case study that identifies components within a teacher preparation program that promote effective mathematics and science instruction in the initial years of teaching. And in "Examining Action Research and Teacher Inquiry Projects: How do they Help Future and Current Teachers?," Polly and colleagues describe the action research and teacher inquiry projects of five teacher candidates and two in-service teachers before discussing how the research process contributes to the development of both teachers and teacher leaders.

Section II focuses on professional improvement, with emphasis on using action research for professional self-study. In the article "Using Content Analysis, Critical Friends, and a Reflective Journal to Impact Districtwide Teacher Learning in Literacy Instruction: An Action Research Self-Study," Shivers and colleagues share an action research project undertaken to determine the coherency of one district leader's messaging during a series of keynote presentations focused on effective literacy instruction. In "Our Continuing Instructional Coaching Journey: An Action Research Project," Emery and colleagues recount how they collaborated on a survey-based self-study to examine their impact as first-year instructional coaches. And in "The Influence of

Teacher Leadership on Elementary Students in an Urban Professional Development School (PDS)," Burns and colleagues report on a longitudinal collaborative inquiry designed to understand how teacher leaders in one PDS positively influenced student opportunities, perceptions, and leadership school-wide.

Section III features teacher leadership roles and student learning. In the article "Professional Development School (PDS) Building Liaisons: Going beyond Student Learning Outcomes," Rutter and colleagues explore ways that PDS building liaisons helped to shape the learning of pre-service teachers and K-5 students. In "Fostering Beginning Teacher Growth through Action Research," Harris and colleagues describe how faculty-in-residence collaborated with in-service teachers at three different PDS sites to conduct action research for the benefit of students. And in "Daring Greatly: School-University Partnerships and the Development of Teacher Leadership," Roselle and colleagues analyze how teachers' commitment to a formalized lead teacher role impacted their self-perceptions as leaders and agents of change, which in turn impacted P-12 student learning.

Section IV showcases classroom-based student learning. In the article "Analyzing Students' Self-Confidence and Participation in Class Discussions," Mallon and colleagues describe how they carried out PDS-supported action research to increase the self-confidence and participation of students with Individualized Education Programs (IEPs) during class discussions. In "Investigating Student Motivation to Read: Community, Environment, and Reluctant Readers," Meritt and Spreer collaboratively investigate why capable fourth grade readers were unmotivated to read self-selected materials for enjoyment during independent reading time. And in "Action Research in STEM: Teacher-Led Projects from Primary to Middle School," Benson-O'Connor and colleagues share summaries of three teacher-led action research projects conducted in partnership with one university's Center for STEM Education to support student learning in individual classrooms and grade-wide.

In each of these studies, P-12 teachers (and sometimes administrators) collaborated with college/university faculty to design and conduct action research that was timely and meaningful. The studies were timely because they addressed research problems or questions that teachers were facing in the moment. The studies were meaningful because the information gathered allowed teachers to better understand the problem or question under investigation and – most important – to take informed action in addressing their problem or applying what they learned.

Why is Action Research Important?

So why is action research important? First, engaging in action research improves teaching practice. Teachers who conduct classroom-based research generally report more effective teaching, more frequent collaboration with colleagues, and improved professional relationships (Boles & Troen, 1994; Gordon & Solis, 2018). Moreover, when teacher leaders conduct action research under the guidance of college or university faculty, they tend to report greater motivation for ongoing professional learning as well as plans for continuous improvement moving forward (Amador, Wallin, & Keehr, 2019).

Second, engaging in action research builds teacher leadership skills. Teachers' engagement in collaborative action research leads to self-confidence and feelings of empowerment (Ryan, Taylor, Barone, Della Pesca, Durgana, Ostrowski, Piccirillo, & Pikaard, 2016) as well as greater

intentionality in decision-making (Amador et al., 2019). Indeed, leading teacher leadership frameworks identify conducting, facilitating, and sharing action research and other forms of inquiry as key indicators of teacher leadership. The Teacher Leader Model Standards' Domain II: Accessing and Using Research to Improve Practice implores teacher leaders to assist, facilitate, support, and teach colleagues to engage in research designed to improve teaching and learning (Teacher Leader Exploratory Consortium, 2011); and the Teacher Leadership Competencies embed reading, conducting, and applying research throughout the four competencies as routine practices of teacher leadership (National Education Association, National Board for Professional Teaching Standards, & Center for Teaching Quality, 2018).

Third, engaging in action research supports student learning. Catelli, Carlino, and Petraglia (2017) reported increased student achievement in third grade mathematics and fourth grade writing following a two-year PDS action research project. Moreover, when teachers engage in collaborative action research, school-wide improvements related to preservice teacher education, curriculum development, classroom-based research, and school governance can indirectly benefit students (Boles & Troen, 1994). In fact, Garin (2017) found that teacher-researchers in both PDS and non-PDS settings reported increases in student learning as a result of their action research efforts. Even when the research findings are "unexpected or less than favorable," action research provides important data that teachers and administrators can use to continue striving for improvement (Diana Jr, 2011, p. 172).

Pulling all three points together, action research is important because it strengthens teaching, leadership, and learning in today's schools. Additionally, action research promotes ethical decision making. In their closing article, Jeffries and Nelson link several of the action research projects reported in this themed issue to NAPDS Essential 1 (NAPDS, 2008) by describing how these PDS partnerships used action research to develop healthy teacher leadership habits, yield positive student learning outcomes, and increase opportunities to enact equity. They conclude:

> …action research begs for more explorations of teacher practice, more clarification of school policy, and more refinement of educational theory. In PDS and beyond, educators must keep doing action research until higher levels of teacher satisfaction, positive student outcomes, and ultimately civic engagement based on socially just understandings of our world are realized (p. 157).

Simply put, action research is important because it is the professional thing to do. It is also the right thing to do.

The PDS Advantage

The action research projects presented in this themed issue illustrate how professional development schools and other school-university collaborations are positioned to provide built-in guidance and support for P-12 teacher-researchers. Guided by the Nine Essentials of PDS (NAPDS, 2008), school-university action research collaborations tend to encourage teachers' exploration of professional practice and facilitate working together in teams around common goals (Boles & Troen, 1994). PDS collaborations also provide systematic professional development and ongoing support as teachers plan, conduct, apply, and disseminate action research (Amador et al., 2019; Gordon & Solis, 2018). Furthermore, when action research is conducted school-wide under

the guidance of a university partner, teacher-researchers are more likely to benefit from principal support (Garin, 2017; Gordon & Solis, 2018). But most significant of all, conducting action research creates professional fulfillment. Garin (2017) explains:

> 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 (p. 24).

Such embedded support, positive outcomes, and opportunities for teacher leadership has been referred to as "the PDS advantage" (Hunzicker, 2019, p. 5).

Concluding Remarks

When P-12 teachers and college/university faculty work together to conduct action research, everyone benefits. The action research projects presented in this themed issue provide models and inspiration for teachers who have considered action research but don't know where to begin. They also offer a starting point for teacher leaders and college/university faculty interested in designing professional development and ongoing supports and structures for action research endeavors, within one classroom, school-wide, and beyond. Additionally, the action research projects presented in this themed issue are meant to generate newfound impetus for writing up action research for scholarly presentation and publication. Even classroom-based action research can benefit others when it is shared widely.

Thank you to my co-editors, Rhonda Baynes Jeffries and Suzanna Nelson, for their vision, commitment, and long hours spent preparing this themed issue of *School-University Partnerships*. Thank you also to the 57 unique authors who contributed their action research experiences and insights in the form of scholarly articles. It is our hope that, after reading the articles that compile this themed issue, our readers will agree: Action research is important.

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Converse, Diverse, Immerse: A Comparative Analysis of Teacher Candidates Doing in Action Research in Professional Development Schools (PDS)

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Abstract: The professional development school (PDS) model of teacher preparation is designed to provide pre-service teachers with the opportunity to work alongside experienced educators in a real-world setting. Action research is often used to find solutions to a problem or to develop an analysis of an aspect of the community of practice surrounding the educational profession. This study examines the lasting effects of action research conducted by undergraduate teacher candidates in a PDS teacher preparation program, compared to teacher candidates who did not participate in action research in a PDS program. The study concludes that, while action research completed by teacher candidates is not always noteworthy, experiencing the action research process with the guidance of a faculty advisor and a teacher mentor has lasting effects on teachers' professional skill development.

KEYWORDS: *action research, professional development schools (PDS), faculty advising, mentor teachers, teacher candidates*

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4. A shared commitment to innovative and reflective practice by all participants
7. A structure that allows all participants a forum for ongoing governance, reflection, and collaborate

The professional development school (PDS) model of teacher preparation is designed to provide pre-service teachers with the opportunity to work alongside experienced educators in a real-world setting (Holmes Group, 1990). Professional development schools are a partnership between university educator preparation programs and their school partners in which the education of new teacher candidates is a shared responsibility of both entities. The PDS model is partially based on the idea that teacher candidates who spend time engaged in real-world clinical settings are exposed to a higher level of knowledge and skill development that might be missed in the university setting, alone. PDS classrooms provide a carefully mentored environment in which teacher candidates have opportunities to apply theories in real-world settings and try things out in a protected environment where the teacher candidate has help and support. Field experiences

provide teacher candidates with strong learning environments as well as serendipitous learning opportunities (Brannon & Fiene, 2013). Studies indicate that pre-service teachers trained in a PDS model are more grounded in theory, comfortable in using theory to support their teaching, and likely to engage in reflective practice (Burton & Greher, 2007; Sandoval-Lucero et al., 2011). Moreover, the PDS experience provides new teachers with a greater comfort level in the classroom and an understanding and willingness to improve teaching skills through ongoing education (Grisham, Berg, Jacobs, & Mathison, 2002). Action research is often used to find solutions to a problem or to develop an analysis of an aspect of the community of practice surrounding the educational profession (Great Schools Partnership, 2015). This study examines the lasting effects of action research conducted by undergraduate teacher candidates in a PDS teacher preparation program, compared to teacher candidates who did not participate in action research in a PDS program.

Background and Research Questions

Launching a PDS program is an exciting time. There are so many possibilities the direction of the program can take. The program at Morehead State University, which began in 2009, was no different. As both university and school faculty and administrators and pre-service teacher candidates met in countless meetings, the Professional Partnership Network (PPN) slowly took shape using the National Association for Professional Development Schools Nine Essentials (NAPDS, 2008) and the National Council of Accreditation for Teacher Education Standards for Professional Development Schools (NCATE, 2001) as guides. The resulting PPN is a sequential, three-semester school-university collaboration developed between Morehead State University and the Rowan County School system in Kentucky. The goal of the program is to provide teacher candidates in elementary and/or special education programs with an opportunity to grow professionally under the guidance of mentor teachers and administrators, as well as to develop a professional network that will provide support for teachers after graduation.

Converse, Diverse, and Immerse Semesters

Three distinct semesters that build on each other compose the PPN. Scaffolded experiences within the PPN provide candidates with an opportunity to apply both theory and skills in the classroom. Each semester, candidates rotate between grade levels and schools within the partnership. Each semester has a different focus and university courses are blocked together and scheduled to provide candidates with opportunities for clinical experiences.

The first semester, the Converse semester, allows candidates to become part of the professional life of the school. Mentor teachers work with candidates in the classroom setting for four hours each week. During the Converse semester, candidates begin to learn professional vocabulary and develop understanding of the professional responsibilities of teaching. Candidates tutor and work with small groups of students during this semester.

The Diverse semester provides candidates with opportunities to learn about diversity within the school community. Candidates work with students, parents, and teachers through a broad range of experiences. Candidates explore the roles of faculty and staff members in the local school. Elementary and special education Candidates are paired together in a collaborative model for a

weekly day and a half clinical experience. Candidates teach both large and small groups of students, and are responsible for managing learning centers, developing units, and building classroom management skills

The third semester, the Immerse semester, scheduled right before the clinical practice semester, starts in the fall. Candidates spend the first two weeks of the school year fully immersed in the partner school. Candidates' schedules for the start of university classes aligns with the public school schedule. Throughout this semester, candidates spend a significant portion of time in their placement practicing how to manage a classroom, assess student achievement, and work with small groups on a regular basis.

During the Immerse semester, candidates practice teaching as they learn how assessment informs instruction, behavior management, lesson sequencing, and state and national professional standards and ethics. By working alongside a mentor teacher for three full days each week, candidates are provided with the structure and guided learning experiences necessary to develop their skills. It is during this third semester that candidates complete an action research project with the help of their mentor teachers.

Action Research Projects

During the Immerse semester, teacher candidates work in partnership with their mentor teachers for three full days each week, all semester long. Because of the increased amount of time in the classroom, candidates are able to observe and develop an understanding of teaching that helps shape their projects. Each mentor teacher is asked to work with candidates to find a topic to research. Once an area for research is chosen, candidates develop an action plan, complete online research modules, and have their project formally approved by the PPN director and their mentor teacher. Candidates then work with their mentors to collect data.

From 2011 to 2016, the director of the PPN mentored the candidates through the development of their projects. During those years, the ways in which candidates developed their projects underwent changes. Candidates were expected to be much more self-sufficient when one advisor was spread between many candidates. As candidates were expected to be more independent, gaps in their knowledge of the research process became apparent. This was especially true in candidates' abilities to write in a scholarly manner. The PPN candidates were seniors, ready to begin their clinical practice semester and presumably ready to enter either the profession or graduate school. However, it became apparent that many of them had no idea how to cite research or develop a literature review. This discovery caused the advisor to arrange small group learning labs to work on research and writing skills.

From 2014 to 2018, a team of faculty members advised candidates through the action research process. Sharing the advising load meant that specific meetings outside of class time were arranged with all candidates to review progress and mentor the studies. Beginning in 2019, the action research project was incorporated into a methods course that candidates take during the Immerse semester to provide extra support. After completing their action research projects, candidates present research posters at MSU's campus-wide Celebration of Student Scholarship Day.

Literature Review

The age-old question of whether classroom teachers should be involved in classroom research (Dewey, 1904; James, 2001) can be addressed by providing teachers the opportunity to learn to use an action research model in the classroom. While many educators are not involved in pure research, they often conduct certain types of analysis to determine best practices for teaching their students. Teachers experiment with strategies and technologies every day but rarely share their results with others.

According to Great Schools Partnership (2015):

> In schools, action research refers to a wide variety of evaluative, investigative, and analytical research methods designed to diagnose problems or weaknesses—whether organizational, academic, or instructional—and help educators develop practical solutions to address them quickly and efficiently. Action research may also be applied to programs or educational techniques that are not necessarily experiencing any problems, but that educators simply want to learn more about and improve. The general goal is to create a simple, practical, repeatable process of iterative learning, evaluation, and improvement that leads to increasingly better results for schools, teachers, or programs. (para. 1.)

Action research is an important component of school-university partnerships. In fact, the fifth of the NAPDS Nine Essentials calls for "engagement in and public sharing of the results of deliberate investigations of practice by respective participants" in PDSs (NAPDS, 2008). School classrooms, therefore, can provide research laboratories for teacher candidates and their mentor teachers to investigate management or instructional strategies in order to better teach their students.

Action research is beneficial to both teacher candidates and mentor teachers. Through action research, mentor teachers and teacher candidates work together to analyze a facet of the community of practice within the school (Lave & Wenger, 1998). Teacher candidates develop professional skills through action research that can result in data-driven decisions and bring positive change to classrooms and schools (Haggarty & Postlethwaite, 2003; Smith & Sela, 2005). At the same time, mentor teachers learn how to check for the effectiveness of practices, strategies, and evaluations; and the sharing of the results of action research projects may result in a higher level of leadership in the school and community early in their careers (Pucella, 2014). In one study, Gilles, Davis, and McGlamery (2009) found that effective teacher induction programs embrace four crucial components: a full year of induction and support; coursework leading to a master's degree; a cohort group; and action research projects. New teachers who participated in such induction programs often assumed leadership roles within their first five years of teaching.

Research Methods

Research Problem and Questions

In the early years of the PPN, action research projects were not a required part of the teacher preparation program; but over the years, as the PPN became established, the projects became an accepted part of the Immerse semester. Specifically, questions arose as to the purpose of the action research project and the degree to which it was of any benefit to teacher candidates since they took place during a very busy semester. It was from this critical look at the program that several

questions were articulated. First, did completing the action research project have a long-term effect on candidates as they entered the teaching profession? Second, what factors influenced the quality of the action research projects? Third, did candidates find value in the experience as they moved through their careers? These questions shaped the study.

Research Participants

Since its inception in 2009, the PPN has supported eleven cohorts. The data for this project comes from feedback from cohorts one through nine, so PPN program graduates have had at least one year of teaching experience to date. The total number of graduates is 137, composed of two males and 135 females. Of the cohorts, one student was African American, two identified as bi-racial, and 134 were Caucasian. During their PPN semesters, 5% were members of athletic teams; 9% were married; 5% were parents of one or more children; 5% were non-traditional students (defined as returning to college or coming to college after age 23); 9% commuted 20 miles or more to attend class and field placements; and 59% were employed for 10 to 20 hours each week.

Data Collection and Analysis

In 2019, a survey, composed of questions with either open response or multiple choice answers, was sent to 83 PPN graduates whose employment or whereabouts was able to be determined. A 20% return rate was achieved. All the PPN teachers had either matriculated in an elementary education or an elementary education and special education teacher training program. In addition, 629 graduates from a variety of non-PPN education programs at the regional university were surveyed at the same time. Of the 629 graduates, 64 (10%) surveys were returned.

By examining the use of action research in a PDS program as a case study (Yin, 2018) and using a mixed-methods approach to data collection (Creswell & Clark, 2017), the researchers were able to combine survey data, sample interviews, document analysis, and observation to address the three research questions. Triangulation of a variety of data provides validity to a study (Patton, 2001). Due to the limitations of open-ended responses on surveys (Patton, 2015), random, informal interviews were conducted with mentor teachers and graduates of the PPN program (Creswell & Creswell, 2018). Candidate posters, abstracts, and presentation data were also examined.

Research Findings

Survey data showed that all PPN teacher candidates completed action research projects during their program, but only 56.2% of the non-PPN graduates completed an action research project. While 58.8% of the candidates were unsure of the value of the research during their undergraduate years, looking back, 64.6% now see it as a valuable assignment. Only 34.6% of the non-PPN graduates said that they felt that their research had any relevance when they completed it while learning to teach, but 60.8% now see it as important. Of the skills that they acquired as a result of conducting research in their undergraduate program, 82.3% of the PPN graduates affirmed that they are using those skills now, while 50% of the non-PPN graduates believe they are using those skills as part of their professional life. When looking at both the confidence and skills gained through presenting and researching 76.4% of the PPN graduates felt that action research had a

positive impact on their abilities, with 58.3% becoming leaders in their schools. Of the non-PPN graduates, 60.8% felt that their research had a positive impact on their professional skills and 42.2% feel they have become leaders in their schools.

One of the questions that was asked of the graduates was to identify ways in which they use research to make instructional decisions. Almost 65% of PPN graduates read and implement research, compared to 56.2% of the non-PPN graduates. A very small amount of teachers in either group completed formal research projects, but informally 58.8% of PPN graduates and 63.9% of non-PPN graduates have compared educational practices and made decisions based on the results. When addressing student behavior issues, PPN graduates were less likely (17.6%) to try different practices and compare results, compared to 48.3% of the non-PPN graduates. A smaller percentage of graduates from both groups was likely to read about student behavior management research compared to instructional practices (see Table 1).

QUESTION	PPN YES	PPN NO	NON-PPN YES	NON-PPN NO
Did you complete an action research project as part of your teacher preparation education?	100%	0	56.2%	43.6%
Have you used research to make educational decisions?				
Yes, I read about research and implemented it.	64.6%	35.2%	56%	43.6%
Yes, I was told that certain practices were research based.	41.1%	58.8%	35.8%	73.3%
Yes, I did a formal research study.	17.6%	82.3%	10.9%	88.9%
Yes, I compared or tried different educational practices and made decisions based on what I discovered.	58.8%	41.1%	63.9%	35.8%
Have you used research to make management or student behavioral decisions?				
Yes, I compared or tried different educational practices and made decisions based on what I discovered.	17.6%	82.3%	48.3%	52.4%
Yes, I read about research and implemented it.	23.5%	75.4%	39%	60.6%
Yes, I was told that certain practices were research based.	17.6%	82.3%	12.4%	87.4%
Do you think your professional skills were enhanced by conducting and presenting an action research project?	76.4%	23.5%	60.8%	38.9%
Did the presentation of your research provide you with Confidence in yourself or your skills as an educator?	76.4%	23.5%	62.4%	37.8%
Have you given any Professional Development sessions or Presentations in your:				
School?	41.1%	58.8%	42.1%	57.7%
District?	35.2%	64.6%	26.5%	73.6%
Regional Conferences or Other Schools?	11.7%	88.2%	1.5%	98.2%
State Conference?	5.8%	94%	10.9%	88.6%
Have you become a leader in your school?	58.8%	41.1%	42.2%	56.8%
Do you use any of the skills you developed as a result of completing and presenting an action research project?	82.3%	17.6%	50%	50%
If you did a research project as a part of the undergraduate program, did you value it as an important activity at the time you participated in it?	58.8%	29.3% / Maybe 11.7%	37.4%	51.4% / Maybe: 10.9%
Do you value it as an important activity of the program now?	64.6%	17.6% / Maybe: 17.6%	60.8%	27.9% / Maybe: 10.9

Table 1: PPN and NON-PPN Graduate Survey Responses 2010-2017

The total number of action research projects from 2011 to 2018 was 84, while the total number of candidates involved was 137. The discrepancy between the two occurred because some candidates completed their projects in partnership. Of the projects, 100% were presented at the university's Celebration of Student Scholarship Day. In addition, several projects were also presented at national and state conferences. Table 2 shows the percentage of projects by theme over the seven years candidates were researched. By far, the most common action research project topic, at 51.1%, was in behavior management.

Topics of Research Projects	Percentage of Projects
Reading/LA Instruction	16.6%
Classroom Environment	7.1%
Split grade level classrooms and instruction	1.1%
Co-Teaching	3.5%
School-University Partnerships/PDS	2.3%
Questioning	2.3%
Behavior Management	51.1%
Behavior and learning style	1.1%
Reading Aloud	2.3%
Preschool Experiences	2.3%
Instruction	7.1%
Gifted Education	1.1%
Historical: Interviews of teachers	1.1%

Table 2: PPN Action Research Projects 2011-2018

Another issue that impacted the data was the issue of advising and supporting candidates as they completed their action research projects. Table 3 shows the number of PPN candidates and faculty research advisors each year. Candidates who completed and presented their research in 2018-2019* are not included in the data pool, as they are just graduating and do not have a professional perspective on their action research activity. A careful study of the types of action research projects from the first ones in 2011 through 2018 reveal an interesting pattern that appears to align itself to the number of faculty advisors involved.

Academic Year of Research Project	Number of PPN Candidates	Number of Faculty Advisors	Faculty to Candidate Ratio	Percentage of Candidates Presenting Projects
2010-2011	5	2	1:2.5	100%
2011-2012	22	1	1:22	100%
2012-2013	16	1	1:16	100%
2013-2014	17	1	1:17	100%
2014-2015	11	1	1:11	100%
2015-2016	27	1	1:27	100%
2016-2017	17	4	1:4.25	100%
2017-2018	12	3	1:4	100%
2018-2019*	25	4	1:6.25	11.1%

Table 3: PPN Action Research Advisors and Candidate Presentation Data

In the first year, two faculty advisors worked together with five PPN candidates on action research projects. PPN Cohort 1 was composed of five teacher candidates, all of whom presented their research at a national conference. The research topics ranged from the effect of kinesthetic movement on retention of information when read aloud to the intersection of art and music. One PPN graduate said, "Going to the conference and having professors from all over the country listen to what I had to say was such an eye-opener for me. Everything that I have achieved professionally is a direct result of the skills I learned in the PPN. I had so many opportunities because of what I did" (PPN Graduate A, 2019).

Between 2012 and 2016, one faculty advisor worked with all PPN candidates, and 83% of the behavior management projects were completed. From 2017 to 2019, the number of faculty advisors increased, and the research studies expanded from behavioral issues to studies that examined the effect of preschool on student achievement, or how having PDS candidates in the classroom impacts student learning. Clearly, an overall shift in the depth and types of action research projects developed when candidates received more faculty advising support. Another PPN graduate reflected, "Having support from the university advisor directly affected my abilities to complete my research and confidently present this research at state and national levels" (PPN Graduate E, 2019). The faculty involved seemed to agree. One faculty advisor stated, "Good teachers are always engaged in research. By completing a project, candidates realize pervasive research is a part of their education" (University Faculty A, 2019).

Discussion

These case study data bring out three important discussion points. First, the data from both the PPN and non-PPN graduates indicate that the action research process is valuable and positively impacts the professional skills of teachers. Teachers feel that their research skills give them confidence and help shape them into leaders. Additionally, a great proportion of the PPN graduates have provided professional development for their state, school, district, region, or other schools at a much greater rate than the non-PPN graduates. One PPN graduate wrote:

> The action research I worked on and presented has helped me grow as a leader in the classroom and school. I was able to present to the KAGE (Kentucky Association of Gifted Education) Conference and the NAPDS Conference, along with the Posters at the Capitol, and the university's Celebration of Student Scholarship Day. This experience has made me an advocate for gifted education in the schools I have worked in based on the research conducted during my time in the PPN (PPN Graduate E, 2019).

Second, the types of research in which teacher candidates engaged were most closely aligned with behavior management. Candidates had various reasons for choosing this topic. Many had completed a classroom management course the previous semester, so it was a topic about which they had some background knowledge. Additionally, behavior interventions are easier for candidates to implement than instructional interventions. One mentor teacher commented, "Sometimes it is hard to help my candidates come up with a topic to research. Since they come at the start of the year, we look at the class and then think of ways to improve how it runs. With only eight weeks to collect the data, a management issue just seems the best option" (Mentor Teacher A, interview, 2019). While a great many candidates chose to complete behavior management projects, the survey data show that many PPN graduates continue to use action research in their

classrooms to make instructional decisions, and a much smaller number of graduates use research for behavior management decisions. In comparison, the non-PPN graduates are more likely to use research for behavior.

Third, when PPN graduates looked back at their action research experiences, it was perceived as beneficial as a form of leadership preparation. One graduate noted that the principal who first hired her commented on the fact that she seemed to be a seasoned teacher in her first year of teaching (PPN Graduate B, 2019). This teacher went on to provide district-level professional development and provide services to various school districts to accommodate state grants related to reading instruction. When asked about leadership roles, PPN graduates listed being team or department leaders, student mentors, principals, district coordinators, school leadership team members, university faculty, department of education staff, and district instructional leaders. The data suggest that whether graduates were involved in research as part of a PDS program or not, action research was still seen as having value.

It is interesting to note that candidates who look back on their PPN experiences and, in particular, the action research project and presentation, find that while the research project itself may not have been on a topic of interest or even an enjoyable assignment, the skills they developed, as a result, impacted their professional skills. Another PPN graduate reflected:

> I loved being involved in the PPN, and as a graduate student now working on an action research project and discussing it with colleagues makes me realize how fortunate I was that I had completed that in my undergraduate years. I had a colleague tell me that that is why she does not want to do graduate school because of the research elements (PPN Graduate E, 2019).

The day-to-day decision making required of young teachers often far exceeds their expectations. Taking on the role of teacher is to be a constant action researcher. A third graduate of the program noted that the action research conducted during the PPN, though difficult, was essential to establishing a foothold in the world of research (PPN Graduate B, 2019).

Implications for Practice and Next Steps

As practices become traditions, the original purpose and intent of an assignment or activity is often lost. In the PPN, new faculty sometimes question the purpose and importance of the action research project, and teacher candidates often express that they are overwhelmed when conducting the research. Even so, the findings reported here indicate that engaging in action research should continue to be an ongoing component of the PPN. In order to support student success with action research, there should be a clear vision of how to direct candidates towards topics that would be valuable and interesting for them. However, advising of the project should be carefully shared between faculty members who clearly understand and value the purpose of the projects.

This became an issue when a new faculty member became an unwilling part of the faculty advising team. The miscommunication that candidates received concerning how to complete their projects and the support they received resulted in only 3 of the 27 (11.1%) PPN graduates of the 2018-2019 academic year sharing their projects at the University's Celebration day. From interviews with candidates, it was clear that a decided lack of confidence in themselves as researchers was a result of negative comments made by the new faculty advisor. One candidate shared, "She told us that didn't want any of us to present because her name would be on the poster

and she didn't want her reputation to be hurt" (PPN Graduate D, 2019). This unfortunate experience is a reminder that the faculty who advise candidates through the action research process need to be carefully selected to ensure that they are motivated to provide positive leadership to candidates. The support that candidates receive as they develop their action research projects is a critical component of their success.

Limitations

This longitudinal case study investigates one regional university's teacher preparation program, making the results unique to the specific place and program of this research setting. Additionally, the PPN survey respondents were compared to respondents who completed a myriad of other teacher preparation programs, which were not limited to elementary education and/or special education programs as were the PPN graduates. Finally, the quality of faculty advising for the action research projects was not easy to ascertain due to subjectivity.

Conclusion

Educators have struggled with whether they should be involved in teaching or research at least since Dewey (1904) and James (2001) became interested in education in the late nineteenth century. At first glance, the action research project as a component of the PDS model appears to be a program add-on and not integral to coursework. However, when looking back, many PPN graduates found value in what they learned, and the experiences offered to them as a result of the action research process. Graduates from both the PDS model and the non-PDS model felt that teacher candidates should be involved in focused and practical action research as a part of teacher preparation. While action research completed by teacher candidates is not always noteworthy, this study shows that experiencing the action research process with the guidance of a faculty advisor and a teacher mentor has lasting effects on teachers' professional skill development. For that reason alone, action research is a valuable component to teacher preparation.

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STEM Teaching and Teacher Retention in High-Need School Districts

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Abstract: This case study sought to identify components attributed to promoting effective mathematics and science teaching through the WISE teacher preparation program and in the initial years of teaching. In addition, teachers' strengths and areas for improvement related to effective teaching and student learning were explored; and their career path trajectories were followed to identify shifts in employment, retention, and leadership. Findings of the study suggest that conference attendance, STEM communities of practice, and university-based mentoring facilitated effective teaching in concert with coursework and clinical experiences. Moreover, administrators indicated that WISE teachers were above average, or "exceptional," in comparison with induction teachers, and all plan to continue teaching in the foreseeable future.

KEYWORDS: *professional development, induction, mentoring, STEM, teacher retention*

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

As the number of teaching positions has increased across many states in the last two decades and teacher retention has declined, particularly among the newest teachers (Ingersoll & Merill, 2010; Ingersoll, Preston, Tekkumura-Kisa, Southerland, & Wright, 2018), preparing effective teachers and supporting these teachers in their induction years have become major areas of focus. Effective teachers have been shown to not only increase learning, but to impact economic and social outcomes as well (Chetty, Friedman, & Rockoff, 2014). Therefore, cultivating effective teachers, promoting teacher leadership, and retaining these effective teacher leaders are critical to the long-term outcomes of their students.

Through a university-school partnership and a National Science Foundation (NSF) Robert Noyce Teacher Scholarship Program grant, Winthrop University has implemented systematic programs and experiences to prepare and support teachers in becoming effective STEM educators who are retained in their induction years and become leaders in the field. The Winthrop University-School Partnership Network (WUSPN) consists of nine districts (more than 50 schools) in South Carolina. The NSF-funded Noyce project, named the Winthrop Initiative for STEM Educators (WISE), is designed to increase the number of effective mathematics and science teachers in high-needs school districts.

This case study sought to identify components attributed to promoting effective mathematics and science teaching through the WISE teacher preparation program and in the initial years of teaching. In addition, teachers' strengths and areas for improvement related to effective teaching and student learning were explored; and their career path trajectories were followed to identify shifts in employment, retention, and leadership.

Research Setting

The Winthrop Initiative for STEM Educators (WISE) seeks to recruit and prepare future teachers as well as provide professional development, coaching, and mentorship during the initial years of teaching. Four predominate activities occur: 1) 3-week paid internship with on-campus housing provided each May targeted at first- and second-year undergraduates that includes implementing lessons in STEM fields at two WUSPN schools (one middle school; one high school); 2) Scholarships for students majoring in mathematics or science (or career changers) who agree to teach for a designated number of years in high-needs school districts, particularly WUSPN schools; 3) Ongoing professional development for WISE teachers (alumni) and WUSPN teachers and administrators. And funds to attend state or national conferences to facilitate networks and promote teacher leadership; and 4) Coaching and mentorship by university-based WISE mentors during student teaching and in the induction years of teaching in concert with school mentors and administrators.

The focus of this case study, using an action research approach while also reanalyzing historical data related to two cohorts of WISE graduates, is specifically on the professional development, coaching, and mentorship of WISE graduates teaching within the WUSPN that lead to effective teaching, teacher retention, and teacher leadership. This study also explores strengths and areas for improvement related to teacher effectiveness as perceived by multiple stakeholders including WISE teachers, WISE university-based mentors, and school administrators associated with each WISE teacher.

Theoretical Framework

The importance of teacher effectiveness in improving student outcomes, particularly student learning and achievement, has been well documented. While many factors are associated with student achievement, the impact of the teacher is among the greatest school-based factors, with estimates between 7% and 21% of the variance in student achievement attributed to the effectiveness of the teacher (Nye, Konstantopoulos, & Hedges, 2004; Hattie, 2009). Hattie (2009) indicated that teacher effectiveness may be more variable between content areas as well. "The

variation in teacher effectiveness is much greater for mathematics than reading outcomes (11 percent on average for mathematics compared to seven percent for reading)," (Hattie, 2009, p. 109).

In a study of elementary mathematics teachers in Washington, Goldhaber, Liddle, Theobald, and Walch (2012) found that an effective mathematics teacher could reduce the achievement gap by about one-fifth between economically disadvantaged students and their economically advantaged counterparts. "Our findings suggest that a one standard deviation increase in teacher effectiveness … would increase student achievement by about 18 percent of a standard deviation," (p. 4). The researchers estimate an additional 2.6 months of learning and achievement in an academic year among students who are taught by an effective teacher.

Teacher education (preparation programs) in general have demonstrated limited impact on teachers' effectiveness (Goldhaber et al., 2012; Hattie, 2009). However, teacher education programs are integrating elements associated with teacher effectiveness such as communities of practice and the provision of feedback within coursework and pre-service experiences. In addition, some teacher education programs are taking a more active role in understanding the effectiveness of their graduates and working with districts through mentorship or coaching initiatives to increase the effectiveness of teachers.

Darling-Hammond, Hyler, and Gardner (2017) identified seven components of effective professional development based on findings from 35 studies that linked professional development to student outcomes. Professional development that is "content focused," "incorporates active learning," "supports collaboration," "uses models and modeling of effective practices," "provides coaching and support," "offers opportunities for feedback and reflection," and "is of sustained duration," has been linked to effective teaching (p. 1). Through its partnership network and WISE initiative, Winthrop has incorporated many of these facets, including a sustained coaching and feedback process that begins during the preparation program and extends into the induction years of teaching.

Coaching has emerged as a supplement or alternative to professional development sessions to increase teacher effectiveness. Kraft, Blazar, and Hogan (2018) conducted a meta-analysis including 49 studies related to the impact of coaching that found "…large positive effects of coaching on teachers' instructional practice," (p. 561). As coaching is becoming more prevalent, particularly within induction mentoring programs, it is important to understand and review the impacts of coaching in developing effective teachers who foster student learning.

In tandem with aspects to enhance educator effectiveness through professional development and coaching, Ingersoll and Merrill (2010) note rising teacher attrition with annual teacher turnover rate increasing from 13% in 1991–1992 to 17% in 2004–2005, with teacher turnover after the first year of teaching approaching 30%. Teachers report leaving for a variety of reasons and some move to another district within their state or to higher-level positions; therefore, attrition must be understood within this context. National research on teacher retention reveals that larger focus and amounts of "coursework in teaching methods, practice in teaching, selecting materials, psychology/learning theory, and teaching feedback" all contribute to retention (Ingersoll et al., 2018, slide 8).

In South Carolina, the Center for Educator Recruitment, Retention, & Advancement (2019) produces an annual report using data provided by 85 South Carolina school districts or public school entities. The number of teaching positions and vacancies in South Carolina schools

continues to increase, highlighting the need to prepare more teachers to meet the needs of the state. In 2018-19, there were approximately 52,600 teaching positions within 85 districts or public school entities in South Carolina. Approximately 7,600 teachers were hired for 2018-19, a 4% increase from 2017-18. Middle and high school mathematics teachers account for 7.5% of all teachers, and science teachers account for 7% of all teachers.

While the numbers of South Carolina teaching positions are increasing, approximately 7,300 teachers left their positions as of the beginning of the 2018-19 school year, which is a 10% increase since 2016-17 and a 28% increase since 2014-15. Approximately 5,300 of these teachers left the profession completely. The number of first year teachers leaving their schools has increased by 29% since 2014-15 with 530 first-year teachers leaving after their first year in 2014-15 compared to 690 in 2018-19 (Center for Educator Recruitment, Retention, and Advancement, 2019).

Vacancies in middle and high-school mathematics and science accounted for 10% and 7.2% of all South Carolina vacancies respectively. Science vacancies increased from 3.5% in 2017-18 to 7.2% in 2018-2019. This corresponds with national data that find that 14.5% of mathematics teachers and 18.2% of science teachers leave the field after their first year of teaching (Ingersoll et al., 2018).

Research Methods

The problem of practice is variability in the effectiveness of teachers (particularly in STEM), which influences student outcomes and high attrition rates of early career teachers within mathematics and science. South Carolina, with its increasing number of teaching positions and increasing number of vacancies, needs to implement and evaluate programs and initiatives that seek to address these issues to ensure the success of its students and their future outcomes, particularly as these outcomes are associated with the vitality of the state.

The Winthrop Initiative for STEM Educators (WISE) sought to address these issues through a multipronged approach throughout preparation and induction in conjunction with WUSPN district efforts in the university's surrounding region. While WISE has graduated three cohorts of students between May 2017 and May 2019 (n=13 students) in this phase of implementation, focused research on the professional development, mentorship, and coaching provided within their induction years (May 2017 and May 2018 graduates only) was needed to understand teaching effectiveness and retention in the field.

Research Questions and Design

The research questions that informed this action research/evaluation approach were:
1. What are perceived strengths and areas for improvement perceived by WISE stakeholders (WISE graduates, WISE mentors, and school administrators) related to effective STEM teaching and teacher retention?
2. How do WISE-facilitated supports and activities delivered within a university-school partnership influence the effectiveness and retention of mathematics and science teachers?

To answer these research questions, case study research (Yin, 2018) was used focused on a single-case design with an action research approach that included interviews, focus groups, surveys, and

document analysis associated with teachers who participated in WISE and were currently teaching in WUSPN schools.

Research Participants

As of the 2018-2019 academic year, five of the eight graduates in two graduating cohorts (2017 and 2018) were employed at four schools within WUSPN districts and were involved in this research; two biology teachers and three mathematics teachers. Three high schools were in urban or suburban areas; whereas, one was in a rural area. The other three graduates from the 2017 and 2018 cohorts were teaching within districts not involved in the WUSPN. Information related to the high schools in which these five teachers were employed is included in Table 1. Two graduates were teaching within the same high school in 2018-2019.

	# students	% students in poverty	# teachers	Average teacher salary	Principal years of experience	% graduates enrolled in higher ed.
High School 1	2218	18.5	132	$52,796	12	87.0%
High School 2	1982	53.0	117	$54,013	7	62.8%
High School 3	1868	50.4	105	$52,649	15	65.5%
High School 4	367	75.2	29	$46,495	1	74.1%

Table 1: 2018-2019 WUSPN High Schools of Mathematics and Science Teachers in Study

Data Collection and Analysis

Semi-structured interviews were conducted with (a) oneWISE mentor who conducted multiple observations with each teacher during a two-year period and (b) three administrators who supervise these teachers. One administrator left the district in summer 2019 during the interview process and was not available to participate in the interviews. Audio recordings from 2017 and 2018 graduating WISE scholar focus groups were reanalyzed to identify themes related to teacher preparation identified at the time of graduation by current first- and second-year teachers involved in the study.

An online survey was administered in April 2019 to gain these teachers' perceptions of the coordination and delivery of supports by WISE and their respective schools. The survey included 18 closed-response items and two open-response items. Closed-response items were summarized using descriptive statistics. Open-response items were coded and grouped into open and axial themes.

Information on the progression of these students through the program as well as their trajectory upon graduation including initial school of employment and school of employment at the time of the study were analyzed based on programmatic documents. In addition, the principal of record at each school was documented during the years that each WISE teacher was employed.

A grounded theory approach was used to analyze data from multiple sources. Initially, open codes were developed across the interview data, focus group data, survey data, and document analysis. Then, open codes were grouped into axial codes by cross-referencing data using a constant comparison process (Corbin & Strauss, 1990; Merriam & Tisdell, 2016). In some instances, data from all eight graduates were used because the teachers were unable to be identified within the context (e.g., focus groups conducted at graduation and anonymous survey data).

Research Findings and Discussion

The overlay of the NSF-funded WISE program within the university-school partnership network seems to have created conditions that enhanced the preparation and perceived effectiveness of STEM teachers. While stakeholders highlight the importance of coursework and clinical experiences within partnership school districts in preparing students to be effective teachers, opportunities and supports provided by WISE were cited as critical in developing these teachers' skills and leadership abilities.

Cultivating Effective Teaching and Promoting Teacher Leadership

Three professional development activities were cited most frequently related to the development and support of effective teaching by WISE students, WISE graduates, WISE mentors, and current school administrators: 1) attendance and networking at local, regional, and national science and mathematics conferences supported through NSF funding/WISE program; 2) the "WISE Community" described as a network of current WISE scholars and alumni (teachers) that are active through social media and on-campus meetings; and 3) support of WISE faculty and mentors including additional "low-stakes" observations that occur for WISE participants during their student teaching and induction years of teaching.

STEM Professional Conferences. WISE stakeholders frequently referenced conference attendance as a critical part of these teachers' development including networking with other teachers and gaining insight into teacher leadership and innovation in STEM. WISE teachers cited the importance of the conference in learning from other teachers and gaining practical strategies that they could use in their classrooms. According to one WISE teacher:

> There would be no way that we could pay for [conferences] without WISE. They provide us with transportation and hotels. That is one of the most beneficial things WISE has done for us. We learned a lot of different teaching strategies [interactive notebooks] and gained different activities that we can incorporate into our classroom.

STEM Community. The WISE Community was also cited by WISE teachers and a WISE mentor as a support system and community of practice for these STEM teachers. According to a WISE teacher, "On top of the [WISE] advisors, we had a support group. We might not have had that support group if we didn't have this program together and getting advice from the past WISE scholars too." Another WISE teacher said:

> We did a lot of networking...knowing that we had a support group specifically for us. I love a lot of my education professors and I would reach out to them and it

was nice to know that these specific people know me so personally and let me
vent and told me it would be fine.

Principals did not specifically cite the WISE Community, but all of them noted that these teachers were above average, or "exceptional," compared to induction teachers in general and some speculated that the preparation and support that they received helped their teaching effectiveness in their initial years in the classroom. According to a WISE teacher, "The connections, resources, and support you get from WISE…gives you an advantage."

Mentorship. WISE offers a formal mentor who conducts an observation during student teaching, and then, multiple observations during the first year of teaching for all WISE teachers. The purpose of the observations is to provide WISE teachers with feedback through a collegial, low-stakes process. WISE teachers can request specific focus areas for the mentor based on the South Carolina Teaching Standards 4.0 observation rubric, which is used in the South Carolina Expanded Assisting, Developing, and Evaluating Professional Teaching (ADEPT) System. In addition, the WISE mentors seek information about teachers' transition from the university to the profession. According to a WISE teacher, "It is nice to know that we have another person to talk to." Another WISE teacher indicated, "There were a few things the [mentor] asked such as, why did you call on these two students? So, it was good in a self-reflective way."

In general, administrators were aware of the WISE mentors, and they indicated the importance of mentorship and support, particularly from an outside entity such as a university. Some of the administrators highlighted district and school-based induction mentoring programs that coincide with the WISE mentors. While difficult to coordinate, one principal highlighted the need to ensure that mentoring was not causing additional stress on new teachers based on these teachers' coordination of multiple mentoring initiatives. In addition, some administrators cited coordination related to focus areas of mentoring by multiple initiatives as a potential need.

While formal mentorship through the designated WISE mentor was noted as a benefit by WISE teachers, these teachers also noted informal mentorship and support by WISE faculty and staff that began during teacher preparation and extended through their induction years of teaching. According to one WISE teacher:

[WISE faculty and staff] really do a tremendous amount for us…. because they
really are such a huge help and go out of their way to help us, and they know us
personally and individually support us based on our personalities and what they
know our personal weaknesses are.

Induction Teacher Strengths and Areas for Improvement

Based on themes across data sources, there are strengths and areas for improvement related to effective teaching and teacher leadership that emerged, based on preparation activities and support systems in place during the initial years of teaching. Strengths identified included 1) preparation in lesson planning, content knowledge, and instructional strategies: 2) more adept lesson timing and pacing in the transition from student teaching to induction teaching: and 3) confidence in redirecting students and effectively managing classroom disruptions. WISE teacher survey results demonstrate perceptions on their preparation in key aspects related to effective teaching. Findings indicate that WISE teachers were more likely to strongly agree to being

prepared in developing lesson plans, using diverse instruction, managing student behavior, and incorporating technology (see Figure 1).
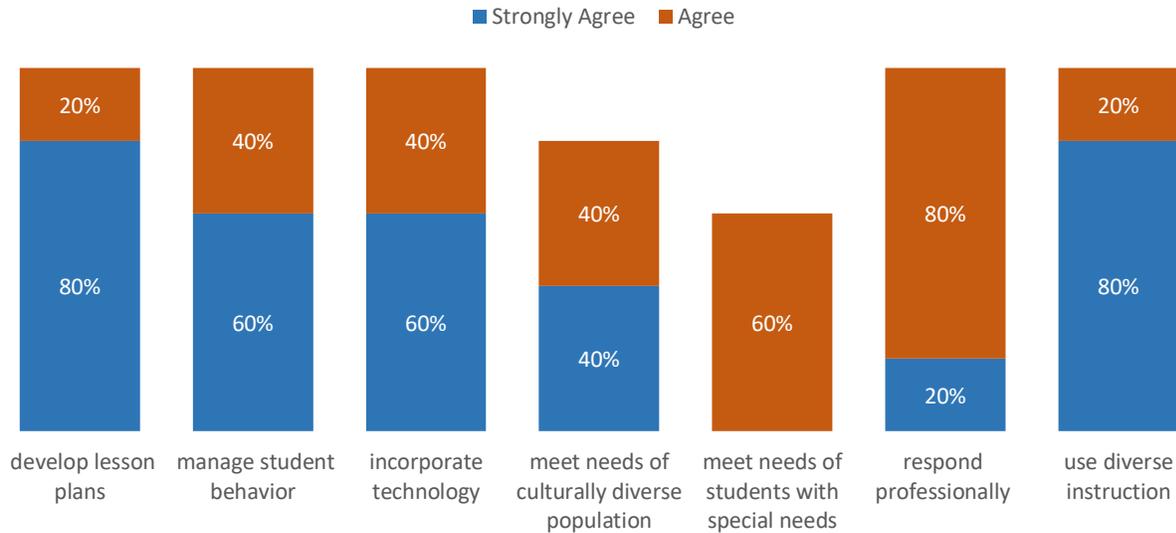
Figure 1: Teachers' Agreement of Preparation/Ability in Aspects of Teaching

The greatest challenges faced by these first- and second-year WISE teachers included 1) meeting diverse needs of students, particularly related to English Language Learners and students with individualized education plans (IEPs) and 504 plans; 2) understanding state, district, and school regulations and requirements, including legal facets (e.g., when doors must be secured, how to deal with students or teachers leaving the classroom); 3) developing their own style, building on their strengths as teachers, and meeting the needs of their students rather than modeling strategies from their clinical experiences or other teachers; and 4) avoiding taking on too many extra responsibilities in the initial years of teaching, such as coaching school sports or leading school clubs.

WISE teachers attributed their experiences in WISE for increasing their leadership skills (80%) and confidence in working in a high-needs district (60%), a requirement of program. According to a WISE mentor, development and confidence transpired from student teaching to induction teaching:

> Things that would bother some of them while they were student teaching didn't bother them as much during their first year. Little classroom disruptions or when they would see something where they might have stopped the class previously, they would walk right over [address the problem] and keep teaching.

Based on WISE teacher survey data that corresponds to themes identified in interviews and focus groups, teachers perceived greater needs at the end of their first or second year of teaching for professional development in managing their classroom and teaching students of varying abilities than they did upon beginning their teaching career. In addition, these teachers report continuing needs for professional development in engaging students and incorporating research-

based practices; however, these are slightly lower now than when they entered the profession (see Figure 2).
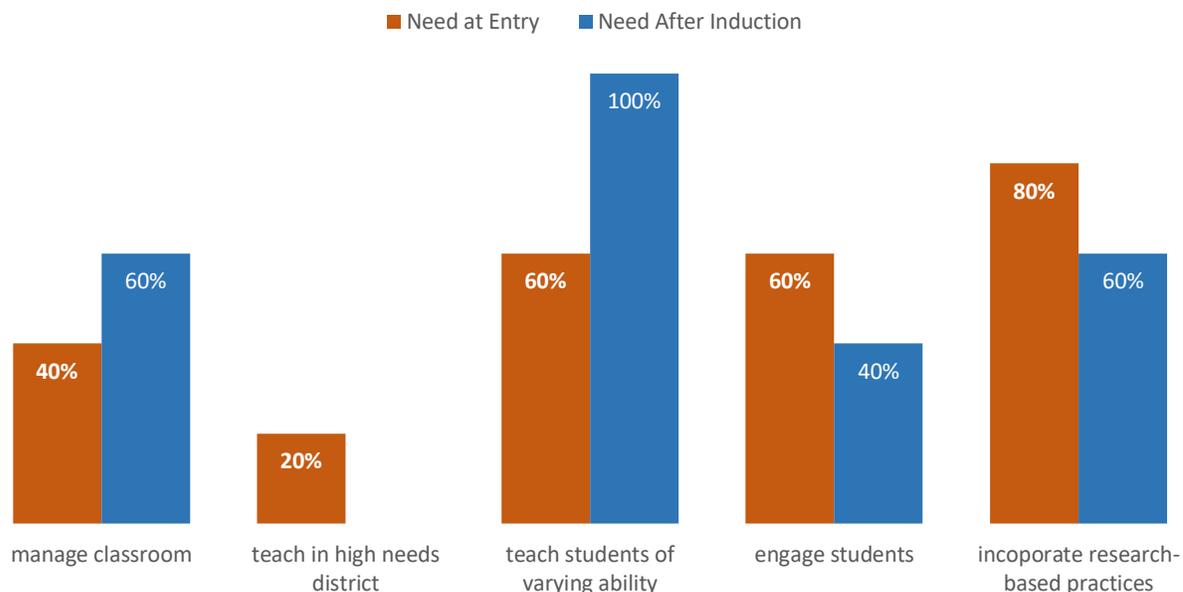
Figure 2: Teachers' Professional Development Needs at Entry into the Profession
and After Induction Year(s)

When asked if they are satisfied with the professional support provided by their current schools, 60% of WISE teachers agreed, and 40% strongly agreed; however, it is important to note that school changes and the principal transition occurred in summer 2019, after this survey was completed, which may impact these levels of satisfaction.

Promoting Retention

As of the end of their first or second year in the classroom, these teachers indicated that they all plan to remain in the classroom as long as they originally intended. Based on their ideas upon graduation in May 2017 or May 2018, this ranged between five years and their entire career. According to one WISE 2018 graduate, "Until I retire. I don't want to leave the classroom." A WISE 2017 graduate said, "I think I was planning on coming back to the college level to do math education. I don't want to put a time stamp on it, but at least six to ten years, and then work on some more professional degrees."

Across stakeholders, there was concern about burnout as many of these newer teachers spend numerous hours outside of school on teaching-related tasks. According to a WISE mentor, the teachers are overworked and exhausted during the first induction-level observation with the university-based mentor, which is typically at the 10-week mark of the academic year. This mentor specifically addressed methods and strategies to reduce stress and fatigue during the initial visit, and usually, these teachers report better work-life balance by the second visit.

In exploring the trajectory of these five WISE teachers and their schools, some teachers (40%) switched schools at the end of their first or second year of teaching. These school changes

may be a factor in their long-term retention and need to be considered to fully understand retention both within schools, districts, and the field. In addition, three of the four schools involved in this study have had administration changes within the last two years. These are factors to be considered as we continue to study the cultivation of effective teachers who become leaders in the field and factors that facilitate or impede teacher retention.

Implications for Practice

Based on these findings, Winthrop University may consider expanding opportunities, supports, and communities of practice for other certification areas using similar strategies to those offered to WISE students and teachers (alumni). These additional components, such as conference attendance, content area or certification-based communities of practice, and university-based mentorship during student teaching and the initial years of teaching lend themselves to the development of effective teaching and promote retention. Winthrop University was able to provide additional supports and resources for STEM teachers based on an NSF grant; therefore, it is important to determine the costs associated with this additional level of support and resources to support these costs.

There is a need to more fully address and integrate strategies and methods to enhance instruction for diverse groups of learners as well as better preparation to work with students with special needs, particularly meeting IEP and 504 plan goals. All stakeholder groups, including WISE teachers, recognized the need for more support in these areas.

Professionalism was highlighted by some stakeholder groups as an area for more focus during teacher preparation and induction mentoring. More specific training and modeling of expectations by the profession and schools were deemed priorities to ensure that teachers meet obligations such as being on time, attending required school meetings, and collaborating with their fellow teachers to improve student outcomes. In addition, gaining confidence and understanding in communicating with parents was identified as an area of professionalism in which more attention is needed among incoming teachers.

Limitations

This case study focused on a specific STEM-based initiative within a university-school partnership in one mid-sized university. Five teachers who participated in a STEM-focused teacher preparation program and were currently teaching in university-school partnership districts formed the basis of this work. While some information may be applicable to other teacher preparation and professional development programs, these findings may be unique to this setting. Teacher effectiveness is also difficult to define and conceptualize, and perceptions of teacher effectiveness may differ based on interpretations. We used a broad understanding of teacher effectiveness considering elements associated with effective teaching that is not confined to student assessments or student performance alone, which is important to consider related to these findings. Student assessment data and formal teacher evaluation data were not available due to confidentiality issues.

Conclusions

This case study found that conference attendance, a community of practice, and university-based informal and formal mentorship during teacher preparation and the induction years of teaching contributed to the cultivation of effective STEM teachers and the development of STEM teacher leaders. These WISE supports were layered onto coursework, clinical experiences, and university-school partnerships to enhance the effectiveness of these teachers in facilitating student learning in mathematics and science. In exploring their career path trajectories since graduation, some teachers have changed schools, and many have experienced administration changes at their schools during their initial years of teaching, but all plan to continue teaching in the foreseeable future. Additional research will focus on retention within their schools, districts, and profession over time, as well as on emerging teacher leadership and impact on student achievement as measured by end-of-course assessments or other measures of content mastery.

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Examining Action Research and Teacher Inquiry Projects: How Do they Help Future and Current Teachers?

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Abstract: Both teacher candidates and in-service teachers can develop their skills as teachers and as teacher leaders by participating in action research and teacher inquiry projects. This article describes the experiences of five teacher candidates and two in-service teachers who conducted action research and teacher inquiry projects in elementary classroom settings and discusses how the process contributed to the development of teacher candidates and in-service teachers as teachers and as potential teacher leaders. Implications include a need for professional development school (PDS) and school-university partnerships to consider including action research and teacher inquiry as integral parts of the work between university-based faculty, teacher candidates, and school-based faculty.

KEYWORDS: *elementary education, action research, teacher inquiry, teacher candidates, professional development, professional development schools (PDS), mathematics, reading, social studies, gifted education*

NAPDS NINE 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

Action research and teacher inquiry projects are systematic ways for teachers to bridge the chasm between research and practice by identifying a problem, designing a possible solution, implementing the solution; then collecting, analyzing, and interpreting data. (Putman & Rock, 2017). Action research extends the work of typical social science research by either researching a specific action or intervention or using data to prescribe and carry out future actions or interventions (Sagor, 2000). Similar to action research, teacher inquiry is another approach that has proven effective for supporting both in-service teachers and teacher candidates in implementing innovative strategies and conducting research to examine their effectiveness (Babione, 2015; Cochran-Smith & Lytle, 1999).

Action research and teacher inquiry projects have been advanced as an avenue to provide teachers with professional learning experiences (Smeets & Ponte, 2009). Action research and teacher inquiry can also support teacher leadership. Teacher leadership has been defined as a form of leadership where teachers take responsibility at various levels in educational organizations (Harris & Muijs, 2005). When teachers and teacher candidates collaborate with one another on research projects, teachers deepen their understanding of content and pedagogy and develop skills related to collaboration and leadership (Harris & Lambert, 2003; Harris & Muijs, 2005).

Multiple studies found that teacher candidates conducting action research led to growth in their leadership skills (Ginns, Heirdsfield, Atweh, & Watters, 2001; Kruft & Wood, 2018; Ulvik & Riese, 2016). A study in which teacher candidates completed action research projects with support from teachers and faculty members found that teacher candidates developed data analysis and research skills which carried over into their classroom (Kuter, 2013). Kruft and Wood (2018) found that teacher candidates and clinical educators both deepened their understanding of data analysis and developed more teacher agency by conducting inquiry around specific problems of practice. A different study found that teachers conducting teacher inquiry research can promote teacher leadership when the school has a culture of collaboration that supports teacher inquiry, and teachers have ownership and some level of autonomy within their own classrooms (Smeets & Ponte, 2009).

In North Carolina, the state in which the work described in this article took place, there is a strong emphasis on developing teachers' leadership capacity. Teacher leadership is one of the five standards on the teacher evaluation instrument used to evaluate teachers every year (North Carolina Professional Teaching Standards [NCPTS], 2013). Moreover, teacher candidates who are seeking initial licensure also must be assessed on their leadership and collaborative skills (NCPTS, 2013).

While the literature documents promise and potential about how teacher candidates and teachers can benefit from participating in action research and/or teacher inquiry projects, there is a need to more closely examine these benefits. Specifically, more attention is needed to examine how action research and teacher inquiry experiences develop teachers and teacher candidates in their teaching and in their leadership skills.

Background and Research Setting

This article is a collaborative effort between Polly, a university-based professor who mentors action research and teacher inquiry projects, and seven others who were either teacher candidates or in-service teachers at the time they completed their projects through the University

of North Carolina at Charlotte. The purpose of the article is to describe their experiences conducting action research and teacher inquiry projects in an elementary classroom setting and how these projects influenced their development as both teachers and as teacher leaders. The first five vignettes involve undergraduate teacher candidates who completed honors research projects during their senior year. The last two vignettes involve in-service teachers who completed action research projects as their master's degree program capstone experience.

Introduction to Vignettes and Examples

In order to find commonalities across projects we used a common reporting framework for every study. For each project, we detail the researcher's personal interest in the topic, the context, the research questions, the study design, the research findings, and implications for practice. We close by describing how the process of conducting action research has contributed to the development of teacher candidates and in-service teachers as teachers and as potential teacher leaders. All of the vignettes were organized around the following questions: 1) What was your interest in pursuing your project? 2) What did you study and what did you find out? 3) How did classroom-based research prepare you to teach? 4) How did classroom-based research prepare you to be a teacher leader? Our goal is to provide multiple examples about how action research and teacher inquiry can provide fertile ground for the growth and development of both future and current teachers.

Action Research Projects by Teacher Candidates

The undergraduate teacher candidates completed these projects within the context of our partner school network where the university places a large number of teacher candidates for clinical practice experiences and full-time student teaching. Each candidate completed a three-semester experience where they learned about research design, conducted a synthesis of relevant literature, and designed a study; then carried out the study and wrote up the results as a research paper.

Assessing Elementary Boys' Interest in Texts within the Classroom Library

I (Burchard) had an interest in why teachers and researchers kept finding that elementary school boys did not like to read and wanted to see what texts they may be interested in. I completed a mixed methods study over two months where second-grade students completed an interest survey, read books based on their interests, and then shared with me during interviews about the books they selected to read and their reasons for choosing it. I found that the topic of the book was more of an influence than the perceived difficulty level of the book. I used parts of various interest surveys to design my instrument and developed the interview questions using the interest surveys and what the literature said about students' interests in text selection.

Completing a classroom-based research project boosted my confidence as an educator immensely and taught me how to write and communicate more effectively. It also taught me a lot about data. In my project, I had a lot of data points. I had to look at surveys, demographic data, times, observations, interviews, and the books themselves. Before this project, I had only worked

with somewhat limited data sets. This project included a few data points for a whole class and a lot of data on a few students. Analyzing and then drawing connections and conclusions from all of this information really prepared me for real classroom data analysis. I learned through the project and conversations with my faculty mentor that it's not just test scores and reading levels; a student who scored low on one test may have had a hard morning at home because they spent ten extra minutes unpacking than they normally do.

Now, I also observe student behavior in a whole new way. I did a lot of observations during my project where I pay close attention to not only what books the students picked, but also how they picked the books. During our literacy centers, I will often postpone my next small group to watch my students as they work and take note of their interests and behaviors. In terms of leadership, completing my research project has given me the confidence and experience to be an expert in something. I lean on that experience any time I speak up in a professional learning community (PLC) meeting, bring an idea to a coworker, or spearhead a grade-level project.

Examining How Teachers Personalize Learning in Mathematics

During clinical experiences, I (Castillo) was in classrooms using technology to provide personalized learning experiences. I wanted to take a closer look at teachers' and students' experiences in personalized learning mathematics classrooms that are differentiated based on data. For the study, I observed teachers, gave them an open-ended survey to respond to, and interviewed students about their experiences in their mathematics classrooms. I focused on kindergarten and first-grade classrooms because there has been pushback in education about young children spending too much time on devices.

I found that teachers' use of personalized learning and differentiated instruction varied greatly. During small groups and centers, students could choose which activities they wanted to do in some cases, while in other cases, students did the exact same activities as their classmates. Regardless, all students reported liking math time and the activities they were doing in class. Doing honors research gave me extra time in the classroom to observe different teachers and how they teach. It also allowed me to interview teachers and hear their perspectives on what they use in their classroom and what works. This information was further validated when I interviewed students to see their perspective.

The research project showed me more ways I can collect data from my students, such as asking students questions or giving them surveys about their interests and preferences. I can then use their responses and feelings to tailor my classroom and lessons to my students. As a teacher, I strive to make my lessons very personalized to my students. I like to implement a lot of student voice and choice in my classroom, and design hands-on lessons. I have used the responses from teachers and students about what materials and centers students enjoy most to help me select some of the materials I have for my own classroom. In terms of leadership, I now have knowledge on a topic I would not know as much about without having conducted the honors research project. By doing an in-depth study, I did a lot of reading on the topic and now know more about personalized learning than many others in my area. I am able to talk with my team about including more personalized learning in their lessons. I also try to share the information that I have learned with others, so they know more about the topic as well.

Examining How a Teacher Plans and Uses Think Alouds

I (Drake) was interested in seeing how teachers use research-based strategies in their literacy classrooms. One of the strategies I saw during clinicals was think alouds as a means of teacher modeling. For my project, I studied a sixth-grade social studies teacher and analyzed lesson plans, notes from classroom observations, and researcher journal notes. I found that the teacher successfully implemented think alouds to model comprehension and used questioning techniques to make the think aloud more interactive and engaging for students. Further, the teacher's use of think alouds varied from explicitly modeling while using a think aloud to modeling and then asking questions.

The project provided me with a foundation of how to learn through research articles. As a first-year teacher, I know I'll be looking for resources to guide me along the way and I feel confident using the knowledge from the topic I've chosen and reading research articles to help me as a new teacher. I am excited to study topics more in-depth in my classroom. Learning how to analyze data prepare me to examine student data by giving me the opportunity to categorize, code, and find nuances within a set of data. I feel more prepared to look at both numbers (quantitative data) and what the data means in terms of student knowledge and growth (qualitative data).

Learning about what research has been done and what has been successful is something I do as a teacher. I think it comes down to good teaching practices based on what's been deemed successful with data to back it up. The ability to analyze data and figure out the big takeaways are all skills I will use as a teacher both within lessons and figuring out the next steps for supporting my students. In terms of leadership, I now have a deep understanding of teaching strategies that I am interested in and want to implement. Even as a first-year teacher, I feel like I can bring the results of what I have learned to see if it matches up in my classroom. I am excited to use what I have learned about metacognition and think alouds to implement research-based practices in my grade or school. I think it gives me the chance to make a name for myself as a teacher within my grade level, even as a first-year teacher.

Examining how a Mathematics iPad Activity Impacts Student Learning

I (Howerton) was interested in seeing how technology helped students with multiplication. I worked with fourth-grade students on a multiplication problem-solving app called Thinking Blocks. All of the students showed gains from the pre-test to the post-test and they all reported how much fun and how engaging the activity was. Through my research project, I was able to spend time in more classrooms before becoming a first-year teacher. I was able to receive more experience and see different classroom environments. Doing this project, I was also able to use the data to implement different techniques in my classroom.

From the project, I was able to begin looking at data from a group of students. I was able to see trends, different strategies, and common errors that students made. Through the data, I was able to implement interventions for each student. I will always be able to use these skills of looking at data and looking at trends. I will also continue to use different strategies with students to see what does and does not work best for students. Through this project, I have learned how to look at data and how to not be afraid to test out new ideas in the classroom. Related to leadership, I can

now clearly communicate about data, share my ideas and strategies with teachers, and use data to back up my ideas.

Examining How Teachers Differentiate Mathematics Instruction

I (Horne) was interested in seeing how teachers used technology when they taught math. I intended to focus on centers and personalized learning but ended up examining general technology use. I did teacher interviews with fourth and fifth-grade teachers about how they differentiated instruction. My findings indicated that teachers knew a lot of general technologies and mathematics-specific technologies but were not able to clearly articulate how they teach with them. In essence, they name dropped technologies, but could not explain how students used them or how they used them for instruction.

I think the research project prepared well for teaching with technology. I am able to better understand theories of teaching, I am able to understand and appreciate the research behind teaching strategies, and I understand appropriate and inappropriate ways to use technology with students. Also, I am better able to look at strategies and innovations, determine if they are working or not, and make changes if needed. In terms of leadership, I feel more confident as a beginning teacher because I have knowledge about a specific aspect of teaching. After reading about and examining how teachers did or did not engage students with technology in mathematics, I think I am now able to contribute to grade-level conversations about student engagement.

Action Research Projects by In-service Teachers

The graduate students were in-service, or classroom, teachers who were in the process of earning their master's degrees. Each graduate student completed ten courses, including a course where they identified a problem and wrote a literature review for an action research project and a course where they implemented and reported on their action research project. Most students in the master's program taught in partner schools, but that was not a requirement for inclusion in this article.

Examining Number Talks

I (Schmitt) was interested in examining how students solve number talks and mental math activities. The goal of my research was to answer two questions: 1) How will targeted number talks affect students' fluency when solving addition and subtraction computations? 2) How will number talks affect students' attitudes and mindsets about mathematics? During the research, my data collection was more in-depth than I would normally do. The extensive nature of the research pushed me to look at the formative assessment of students during the number talks. For my first research question, I used two different numerical values on their exit tickets, one for elements of fluency and one for strategies used. For my second research question, I collected numerical data on students' attitudes and mindsets about mathematics. This level of data allowed me to examine much more than just the accuracy of answers on their exit tickets. Examining this combination of data allowed me to make better choices for my next moves with students and with the number talks.

As a math instructional coach for my district, I already hold a position of leadership. Doing this research gave me more buy in from teachers about implementing the number talks. For example, we hold district-wide math meetings with two teachers from each school. Because my district values finding and sharing the "why" behind our work, I successfully shared my research project as well as my findings during one of these meetings. Then, I shared it with the entire staff of teachers at several of my focus schools, as well as with the 17 instructional coaches that work in my district. I now try to support all of my claims and decisions with research to support the resources our district is using to teach math.

Examining Mathematical Mindsets

I (Peake) was interested in investigating growth mindsets in mathematics, sometimes called mathematical mindsets (Boaler, 2015). In my classroom, I examined the influence of challenging and encouraging my academically and intellectually gifted (AIG) third-grade students to persevere through mathematical problem solving over the course of many weeks. I researched their determination through growth mindset surveys, their performance on challenging tasks, and the amount of time it took for them to complete the tasks. I found that my encouragement and comments encouraged them to persist through struggle, caused them to not give up, and helped them to explore mathematical tasks that were multi-step and complex.

This action/data-based research helped me to explain my teaching philosophy and the "why" behind my practice to all stakeholders, including my principal, other school and district administrators, my teaching team, and parents. After the project, when my district adopted a new math curriculum, I utilized only a small part of the new curriculum and continued to use a more hands-on, exploratory way of teaching. This project led me to feeling confident in my decisions and in my ability to look at my students' data and make appropriate choices about how to teach them.

Doing research made me mindful of the research process, gave me experience in analyzing data, and prepared me to discuss data in a meaningful way. I have been a teacher for four years. In this short time, I have been the math lead for my school for two years and the grade level chair for one year. I have worked for the district in both the math and social studies departments. I feel like my experience in research and data mindset has provided me these leadership opportunities. This action research project reinforced the importance of analyzing student data and provided the opportunity for me to learn this important skill. I have not had the opportunity to learn this skill on the job, so I feel it was very valuable to gain this experience in my master's degree program.

Discussion and Conclusions

Table 1 (below) includes a summary of the seven vignettes presented above. To make connections between them, we will close by describing how the process of conducting action research has contributed to the development of teacher candidates and in-service teachers as teachers and as potential teacher leaders.

Name	Topic	Data Sources	Growth
Burchard	How boys select literacy texts	Survey and interview	Teacher: More observations of classrooms, learning how to use and interpret multiple data sources to make decisions Leader: Confidence, expertise in an area
Castillo	Use of personalized learning in math	Classroom observations, interviews of teachers and students	Teacher: More observations of classrooms, personalizing learning based on students Leader: Opportunity to learn about one concept; able to communicate with other teachers about a topic
Drake	Use of think alouds in literacy	Lesson plans, classroom observations, interviews	Teacher: Developed expertise in a topic through reading and observations, practice analyzing and interpreting data Leader: Deeper understanding of specific teaching strategies
Howerton	Influence of a digital math game on multiplication	Student scores, observations, interviews	Teacher: Practice planning interventions, and analyzing and interpreting data Leader: Practice analyzing data, practice communicating data to others
Horne	Teachers' use of technology to support differentiation in math	Interviews and observations	Teacher: Deeper knowledge about determining if interventions are working or not, and how to modify them Leader: Able to contribute to conversations about teaching and student engagement
Schmitt	Mental math activities and achievement	Students' work on math activities	Teacher: Opportunity to look more closely at data and be intentional about how data leads to my decisions Leader: Developing dependence on data and using data to support decisions made as a district math leader
Peake	Influence of support while gifted students explored challenging math tasks	Observations and interviews	Teacher: Experience collecting and analyzing student data and using that to make decisions Leader: Knowledge of using data to make decisions and being able to communicate and share that as a grade level chair and work on district curriculum documents

Table 1: Synthesis of Vignettes

Benefits of Engaging in Teacher Inquiry and Action Research

In the descriptions shared in this article, both teacher candidates and in-service teachers report the benefits of action research and teacher inquiry research projects. The benefits reported include a focus on a deeper understanding of specific aspects of teaching and progressing toward expertise in an area of interest that closely connects to the work of teaching. Both teacher candidates and in-service teachers reported enjoying the process of reading research, designing and carrying out a study, and making sense of data in terms of suggestions for teachers.

In all cases, teacher candidates and in-service teachers studied either teachers or students, using data from a variety of sources, including surveys, interviews, and classroom observations. Teacher candidates Buchard and Howerton and both in-service teachers (Peake and Schmitt) studied students, while the other projects (Castillo, Drake, and Horne) focused on teachers. Regardless of the participants, all of the projects provided teacher candidates with opportunities for additional time in classrooms and in conversations with teachers. For in-service teachers, the projects provided an opportunity to be more intentional and explicit about trying an innovation and examining data related to the innovation.

The action research and teacher inquiry projects described in this article extends onto the current literature as they affirm the belief that teacher inquiry and action research can provide systematic ways for teacher candidates and in-service teachers to examine a problem, design and implement a solution, and analyze data about the impact of that solution (Babione, 2015; Cochran-Smith & Lytle, 1999; Putman & Rock, 2017). Further, these experiences allowed teacher candidates and in-service teachers to focus expressly on a specific context or topic related to teaching and develop expertise in that area (Harris & Lambert, 2003; Harris & Muijs, 2005; Smeets & Ponte, 2009; Urbina & Polly, 2017).

Future research projects looking at both teacher candidates and in-service teachers should examine whether and the extent to which teachers apply and make use of their research project after the project is completed (Polly, Binns, & Putman, 2017; Polly, Rock, & Zaionz, in press; Kruft & Wood, 2018). For example, Drake's project on think alouds in literacy may be followed up by examining how she uses think alouds herself and how her experiences doing inquiry research on the topic influences her decisions as a teacher. Further, there is a need to examine teachers and teacher candidates who have completed inquiry and action research projects to answer the question, how does completing the project influence teaching and students in the year or years following the project?

Developing Teacher Leaders through Inquiry and Action Research

In this article, each teacher candidate and in-service teacher was asked about leadership and how this project developed leadership potential or skills. Candidates reported many comments, including that engaging in research, developed their confidence in communicating in writing and orally about their project and about teaching in general. There were common sentiments that despite being young and new, they felt sure of themselves and willing to share what they found with teachers on their grade level as well as with other educators. Further, practicing teachers reported that the process fine-tuned their attention to data and research to the extent that they now look for data, evidence, and research to support their decisions in their various teaching and

leadership roles. For example, Schmitt, who is now a district mathematics coach, reported that she looks for data to support all of her decisions as a district leader. This article adds onto earlier work, which found that teacher candidates developed their leadership skills while engaging in teacher inquiry and action research projects (Ginns, Heirdsfield, Atweh, & Watters, 2001; Kruft & Wood, 2018; Ulvik & Riese, 2016).

Future studies need to examine teacher candidates and in-service teachers over time to see how their leadership skills develop over time. This should include studies that involve an action research or teacher inquiry project followed by other similar experiences, which may include multiple iterations of inquiry around a given topic for a given set of time (Fishman, Penuel, Allen, Cheng, & Sabelli, 2013). Leadership skills should be examined in research studies through multiple data sources including, but not limited to, data from interviews, surveys, or focus groups of not only teachers or teacher candidates engaging in action research and inquiry projects, but also those who interact with individuals engaging in action research and inquiry projects.

Limitations

This article provided a synthesis of action research and teacher inquiry projects completed by undergraduate- and graduate-level teachers enrolled at one higher education institution. While the findings provide insight to the field, we acknowledge that each teacher's context is different and that experiences are not generalizable.

Conclusion

In the NAPDS Nine Essentials (NAPDS, 2008), the following Essentials are central to the work embedded in action research and teacher inquiry projects:

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

Based on these Essentials, PDS partnerships have potential to be contexts where action research and teacher inquiry is a central and integral component. If you consider Essential 1, related to the goals of PDS to promote equity for all students, and Essential 2 which talks about an intentional focus on integrating teacher candidates into the school community, it makes sense to consider inviting teacher candidates into the school and providing opportunities to collaborate with their clinical educators and other school-based faculty. Part of this collaboration should include experiences to examine an instructional problem related to equity and student performance, design, and implement an intervention and examine the impact of it, such as the action research projects presented in this article.

For educator preparation programs to provide these experiences for teacher candidates, there is a need for strong partnerships built on mutual respect and investments in these types of experiences for teacher candidates. In the examples in this article, either faculty helped connect candidates with schools to carry out the studies, or candidates conducted their research in classrooms in Professional development schools or partnership schools. In these schools, candidates were already completing clinical practice assignments for other courses in their program or faculty had a close relationship with the school. There is a need for educator

preparation programs to consider action research and teacher inquiry as one of the integral aspects of strong Professional Development School and school-university relationships. In the case of these studies, some districts and school partners maintain an open approach to both clinical practice and research in their school, while others allow only clinical practice and do not allow research to occur. While it is possible to have partnerships focused only on clinical practice without opportunities for teacher candidate inquiry and research, there is a need to explore the mutual benefit of partnerships that collaborate on inquiry and research projects between teachers and teacher candidates.

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Using Content Analysis, Critical Friends, and a Reflective Journal to Impact Districtwide Teacher Learning in Literacy Instruction: An Action Research Self-Study

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Abstract: This action research self-study was conducted to determine the coherency of one district leader's messaging during three keynote presentations focused on teacher learning in the area of literacy instruction. Key literacy topics included comprehensive literacy, next generation literacies, and content creation. The study utilized content analysis, critical friends, and a reflective journal. As a result of the study, seven thematic patterns of communication were identified: promoting a culture of excellence with teacher leaders; modeling engagement and inclusion; wrong use of research; simplicity and focus; intent versus impact, data absence versus abundance; and forcing metaphors versus flipping the message.

KEYWORDS: *professional learning, next generation literacies, critical friends, action research, self-study, content analysis, reflective journal*

NAPDS NINE 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

In November, February, and April of the 2018-2019 school year, a professional learning series called the Comprehensive Literacy Summit (CLS) was held in Manhattan-Ogden Public Schools, a rural school district in Manhattan, Kansas. The goal of the CLS series was to help more than 500 educators meet the needs of nearly 3,600 students in the district's nine elementary schools.

As the director of elementary programs for Manhattan-Ogden Public Schools since 2013, it is my (first author) responsibility to work with a districtwide team to design and communicate the essential aspects of comprehensive literacy instruction that integrate next-generation (commonly referred to as next-gen) literacy skills (National Council of Teachers of English, 2013) and support student content creation. At the beginning of each of the three CLS sessions, I was called upon to deliver a keynote overview before teachers divided into interest-driven, small group breakout sessions. These keynote presentations were our best opportunity to encourage unity and consistency in literacy instruction during the CLS series. With our focus on selected English/language arts (ELA) curriculum tools, I wanted to highlight the best methods for digital teaching and writing during each keynote.

Ongoing professional learning is critical to ensuring that all educators, myself included, feel equipped with the tools needed to be successful in meeting the ever-growing demands of their jobs. So, at the conclusion of the CLS series, I undertook an action research study to consider the clarity and consistency of my messaging during the three keynote presentations. My action research took the form of a self-study, with help from two critical friends who examined the text, images, and weight of my presentation slides to analyze how well they aligned with my intentions. Using an action research process, I set out on a journey to learn how I could be more effective in impacting districtwide teacher learning in the area of literacy instruction.

Context for the Study

In my current role, I am responsible for providing professional learning related to next-gen literary analysis and student content creation as well as supporting achievement for all K-5 (kindergarten through fifth grade) students through a guaranteed, viable curriculum; appropriate resources for learning; data for analysis and decision-making; and ongoing improvement using research-based instructional practices. Bolstered by the professional development school (PDS)-university partnership in existence for decades between Manhattan-Ogden Public Schools and Kansas State University, I work and learn alongside several professionals and scholars to gain a better understanding of successful literacy programs. Within our PDS-university partnership, there are several professors with expertise in the foundational skills of reading and writing, adolescent literacy, action research, and literacy across the disciplines that support the flow of information, such as year-long literacy institutes, quarterly improvement seminars, one-on-one meetings, and emails and social media updates from which I glean the latest research-based instructional practices to share with my teacher teams. I also have many opportunities to collaborate with my district's executive director, our directors of early childhood and secondary education, our special education director, our research and evaluation specialist, and nine building administrators, plus a team of lead ELA trainers.

Starting with the 2018-2019 school year, after a careful two-year review process, the core ELA program *Wonders* was adopted by our district as a rich and robust literacy program for grades K-5. *Wonders*, a McGraw-Hill Education product, is designed to help students meet high academic standards and prepare them for future success. This resource provides concrete examples of the 2017 ELA Standards and encourages next-gen literacies with effective daily practices such as staircasing complexity of text and constructing text-based answers. In district classrooms and intervention groups, students use *Wonders* to close read, write analytically, and practice foundational literacy skills. At that time, since few educators knew what next-gen literacies involved, I used *Wonders* to begin crafting a message that would open new doors for next-gen comprehension, where readers could construct meaning and knowledge while engaging in digital reading practices such as reading to identify problems, reading to locate online information, reading to critically evaluate, reading to synthesize, and writing to communicate new information.

Another of the district's key initiatives during the 2018-2019 school year was an action research group within the district, facilitated by our university partner. As an instructional leader, I wanted to support and model active professional learning, so I participated in the action research group alongside the district teachers. Rather than the one-time professional learning model that I

had used in the past, I wanted to try longer-term professional learning schedules and provide options with educator choice, curriculum protocols, and delivery models to strengthen next-gen literacy and content creation models. I sought to build a safety net to support educators and students. This is how the CLS series developed.

The CLS series centered on two overarching literacy goals while respecting districtwide demographics of English Learners (8%), students with Individual Education Plans (IEPs) (21%), and students from economically disadvantaged households (42%): 1) Enable each student to proficiently read, communicate, and learn with next-gen literacies, including access, source analysis, synthesis, and evaluation, and 2) Revolutionarily transform students at all levels from content consumers to content creators, enabling them to problem solve, collaborate and produce multimedia products shareable with a wide, global audience.

Literature Review

In preparing for the CLS series, I reviewed the research on the power of sustained, job-embedded professional learning on student achievement. Bolam, McMahon, Stoll, Thomas, and Wallace (2005) reported that the "greater the extent of reported staff involvement in professional and pupil learning, the higher was the level of pupil performance and progress in both primary and secondary schools" (p. 132). Yoon, Duncan, Lee, Scarloss, and Shapley (2007) referenced a study that found that "teachers who receive substantial professional development ... can boost their students' achievement by about 21 percentile points" (p. 1). Michelson and Bailey (2016) pointed out that "a long-term, comprehensive approach provides the necessary key to propelling educators past initial resistance and toward a self-sustaining community focused on student achievement" (p. 27).

As I prepared, I realized that the CLS series would be my opportunity to create unity and consistency around our new literacy program and build teacher leadership to sustain the program in order to improve student achievement related to our district's literacy goals. As I began designing the keynote presentations, I was reminded through the research that curriculum development knowledge is seen as a prerequisite to teacher leadership (Gehrke, 1991). Additionally, teaching expertise in one's subject matter is critical because it is basic to other teacher leadership roles and responsibilities, including in-service education, advising and assisting colleagues, and peer support (Gehrke, 1991). In order to build teacher capacity, I realized I would need to provide time for collaborative curriculum development centered around the *Wonders* resources. I also considered that Fink (2014) cited the following behaviors exhibited by instructional leaders related to professional learning: giving feedback, modeling effective instruction, soliciting opinions, supporting collaboration, providing professional development opportunities, and giving praise for effective teaching (p. 32). I realized it would be important to construct learning activities that allowed me to model these behaviors.

Recognizing that our district was in the midst of significant change, I knew it would be necessary to clarify a mission and a vision surrounding this work. At the district level, we had already established our mission: having our students be college and career ready and on grade-level in benchmark assessments. However, *how* we were going to support our students in achieving those goals needed a clear vision (Fullan, 2004). In creating a vision, Conger (1991) described the use of framing and rhetoric. Framing is the way leaders portray an organization's mission to

convince the organization to accept and enact the mission. Rhetorical crafting is the use of language and images to evoke emotion, create connections, and motivate the audience (Conger, 1991). As I designed my keynote presentation slides and stories, I was intentional in both the framing and the rhetoric I chose to convey a vision for our literacy program, which was to reinforce the principles of comprehensive literacy and next-gen literacy skills and to encourage content creation through a year-long professional development effort. Each keynote presentation lasted 60 to 75 minutes and included an average of 100 slides. Knowing that there is typically limited retention of information from oral presentations, I crafted each slide show to allow teachers to download and refer to all slides and documents during and following the presentations.

Action Research Methods

This action research study used self-study and content analysis methods to determine the coherency of my messaging through the CLS keynote presentations. The study was action research in that it followed a traditional action research process: 1) identifying a question, 2) developing a plan, 3) gathering data, 4) analyzing data, 5) reflecting on the experience, and 6) taking action to improve practice (Holly, Arhar, & Kasten, 2005). Action research is also systematic, intentional, and based on a personal inquiry (Lytle & Cochran-Smith, 1990). The study was a self-study in that the focus was on me and my work, both as a researcher and as the person being researched. In other words, I was studying myself, in order to improve my own practice, using data that I generated.

In addition, "a defining feature of self-study research and practice is its emphasis on collaboration with others" (Berry & Russell, 2014, p. 195). Therefore, I included two critical friends in my research to help me view my presentations with more objective eyes, deepen my reflection, and challenge my personal theories (Loughran, 2007). My critical friends were our district's director of secondary education (second author) and the university professor who facilitated our district action research projects (third author).

The research question I posed was, in what ways, if any, did the CLS series keynote presentations clearly identify comprehensive literacy, including next-gen strategies and content creation tools? To answer this question, I chose to conduct content analysis of the three keynote presentations. Qualitative content analysis identifies relevant thematic patterns in a text (Neuendorf, 2016). Often thought of as a quantitative method, it goes beyond just counting words and "provide[s] knowledge and understanding of the phenomenon under study" (Downe-Wamboldt, 1992, p. 314).

Using an inductive approach, my critical friends individually viewed and coded the slides from each of my three presentations without preconceived categories (Kondracki, Wellman, & Amundson, 2002). They looked at both the images and text that I selected to convey my main ideas and considered the potential effects they might have had on the audience while also looking for the coherency of my message. They also read and coded a reflective journal that I maintained during the study about my intentions and impressions of each of the three sessions.

After coding the texts, the three of us met to debrief and discuss their coding of the slides and the coherency between my intentions (from my reflective journal) and the actual slides. Together, we generated a list of thematic patterns of communication across the three keynote presentations.

Findings and Discussion

In the self-study action research process, I found that I greatly value communication and felt mostly positive from the keynotes. I found strengths with themes of empowerment and engagement. On the other hand, I needed to review several key areas when planning and designing content. Through deep self-reflection and the use of critical friends, I discovered ways to improve the communication of my ideas with goal areas like simplicity and focus; better research and data connections; next step focus; and appropriate selection of rhetorical devices to communicate and emphasize the important themes I wanted to convey through the CLS series. As the slides were the key point of communication for the Summits, understanding their impact was critical. Each keynote lasted 60 to 75 minutes. As Table 1 shows, there were on average 100 slides per session, with limited focus on next-gen literacies and content creation.

% of slides focused on:	CLS 1	CLS 2	CLS 3
Comprehensive Literacy	31 (25%)	14 (13%)	38 (47%)
Next Generation Literacies (digital reading and writing)	16 (13%)	3 (< 5%)	0
Content Creation	0	4 (< 5%)	0
Total # of slides	126	110	81

Table 1: Percentage of Slides Focused on Literacy Topics

In considering the coding from my critical friends and our debriefing discussion, there were seven thematic patterns of communication that we identified. The next section describes the patterns we noted and provides quotes from my reflective journal about the presentations and commentary from my critical friends during our debriefing.

Promoting Culture of Excellence with Teacher Leaders

I wanted to support a culture that strengthens teacher leaders to overcome challenges by empowering them to diagnose situations, manage themselves, energize others, and intervene skillfully around literacy goals. As I reflected in my journal, "Goals are so important for our team to see where we're headed with clarity, so I shared our horizon line with everyone over a few slides to save countless emails later on," and I celebrated teacher successes. To me, this showed the urgency and importance of our professional learning. Demonstrating mixed evidence in this area, one of my critical friends expressed uncertainty regarding purpose: "I think you are wanting to create safety in the group by doing an icebreaker." I see now that I should have better connected the relationship of this activity to building district culture.

Modeling Engagement and Inclusion

Even with a full plate of items to cover, I tried to honor the attention limitations of my audience. I incorporated several cooperative learning opportunities, games, or videos into each session, but as the analysis of slides suggests, I placed too much emphasis on these brain breaks to the detriment of content. In CLS 1, only 37% of the slides focused on the goal areas. In the final CLS, I reflected in my journal, "With the spring and Easter timing, I hid eggs with close reading strategies inside. As teachers found the eggs, they came to the front to read their strategy to everyone." I think these games positively impacted our culture but needed more focus towards the larger goals to help teachers make the connection. As one critical friend stated, "I might have done fill in the blanks on the slide to see if they can remember it." This helped me think about the engagement tools I used and ways to refine them in the future. My other critical friend shared, "I like the idea of the game to engage participants. I'm just not sure about the questions posed. Could they relate more to what was discussed last time? Retrieval of stored information would be a strong practice in moving it to long-term memory and thus encouraging its practice."

The timing of my engagement tools also could have been better synthesized, as I noted they were always near the beginning of the presentations. As one critical friend said, "Again, I would suggest moving all of these slides to the end." I agree that I should have better considered the flow of the presentations. While I improved in terms of audience inclusion from the first to the third presentation, which also positively impacted the content, I want to continue to improve on incorporating relevant cooperative learning opportunities to engage teachers throughout each session.

Simplicity and Focus

In all of my presentations, I stated a focus area, but I didn't deliver a central message to a successful degree. I'd give a priority, followed by another, and then another. It became a lengthy list. Yet, in my planning, I thought I had narrowed the topics. As I stated in my journal, "My slides give a truly honed message. This creates an umbrella and framework to guide our time." In reality, I found that I had created too many sections or topics. My critical friends asked, "What is MOST important right now?" In CLS 2, with over 100 slides and only 19% focused on the goal areas, I recognized that it would be difficult for the audience to pinpoint the most important thing. As for tone, one of my critical friends observed, "This sounds like a cruise ship activities director, trying to generate enthusiasm for an unsure crowd!" I did grow and improve, as is evidenced in CLS 3 where 46% of slides related to a goal, but now I realize that I need to continue to clarify the intent of my message and land on one priority to convey. I hope to better simplify and focus on all three presentations in the future.

Wrong Use of Research

Rather than highlight specific skills to support our work with refined thinking, I just dumped in research like a flood of destruction. I approached the presentations, especially the first one, with a "you want research, I'll show you research" attitude that completely missed the mark and overwhelmed my audience. I wanted to support struggling readers and writers through

research-based, informed, systematic instruction; but it was simply too much, too fast, and too out of context. As my critical friends stated, "Although interesting, you don't need to throw ANOTHER list of nine things to do." My attempts to provide research and conclusions failed. Even when I tried to pinpoint key ideas on the slides using text features like underlining and bold text, I don't think I met my objective of highlighting research-based ideas. One critical friend observed, "What you underlined doesn't seem to be the most important part of the statements." How could anyone know where to invest most?

I also need to better cite research and document ideas for those who want to refer to the slides as a reference down the road. Without the audio, several points might be confusing due to lack of text on the slides. Additionally, I repeated too many parts too often. As one critical friend said, "I feel like we covered this." I needed to succinctly present more timely research that would allow us to reduce variance of practice.

Intent Versus Impact

These keynotes were designed to share a central, united message of student learning and teacher leadership, and provide a districtwide point of reference for teams to return to since all participants possessed digital access to the presentations. As I wrote in my reflective journal, "This was one of the first times we'd all been together in a keynote style setting. Based on feedback from past sessions mentioning that we lacked a central message, my intent was to provide clarity and focus." I attempted to provide nearly 500 educators with the same marching orders, yet I found that I failed to adequately deliver on my intent because I didn't consider deeply enough the impact of the sheer volume of the content.

I wanted to appear as an authority on literacy to meet my team's expectations, but I needed many more experiences actually teaching or co-teaching from the standards curriculum and resource tools. While my intention was solid, the impact was weak. As I stated in my journal, "I wanted to speak with practical authority of examples because I was able to see these things in action due to spending time in classrooms and with students learning together from these tools." Yet, many of these topics were questioned by my critical friends: "Why here? Why now?" Rather than drawing from actual classroom work, I used inauthentic examples, which was noticed by my critical friends: "Good to include an example, but would a real student example be more useful?" I now realize that I need to provide better student exemplars, case studies, and actual progressions of literacy learning. Based on the slide analysis, I also need to give more attention to writing and content creation in order to impact these areas in the classroom setting and have the data to support it.

Data Absence Versus Abundance

Trying to be all things to all people, my keynotes became entrenched with an abundance of unrelated information. For example, as one critical friend stated about the first presentation, "By the end, you have used 13 different slide styles/formats and covered 40 distinctly different topics. There is no clear focus of the session. There were a lot of announcements, previews, sign-ups, etc. The 9 Keys of *Wonders* only had 18 sides; that is less than 20% of your presentation." I wish I could have done more to cut down the presentation and showcase how digital reading and writing

present special challenges. I should not have included everything I was thinking, but rather found the main ideas. In reviewing the slides, my critical friends stated more than once, "Again, these slides are not needed to make a point." So, my goal was left unmet as I pulled in too many topics that were not the intended central focus. The slide analysis highlights the fact that the key areas didn't get enough attention.

Additionally, I did not adequately pull in student-level data to inform practice. To promote literacy, I was committed to working out some of the challenges and stigmas of comprehensive literacy so our children can be identified as students and scholars; not labeled by their limitations. However, my messages fell short with student data either being absent or not justified in the presentations. Too often, I either left out data completely or dumped student results onto participants without enough meaning or context. Upon reflection, I should have shared winter data on universal screeners and/or other pertinent assessment information.

Forcing the Metaphors Versus Flipping the Message

Finally, I wanted to provide several sources of inspiration to encourage my teams in this difficult work. As I wrote in my journal, "I love using analogies and big images to tell our story and remind my team of our ideals." I wanted to make my messages easily remembered back in the classroom in order to inspire perseverance and a growth mindset, yet these messages didn't always hit the mark. As one critical friend stated, "Here's that slide that makes me dizzy! Is the message that this is still a steep learning curve? Am I not conquering part of it by now?" My other critical friend said, "Personally, I don't find this video funny." I needed to consider more perspectives and not approach everything through my own lens. I hope to provide more inclusive videos and images, and balance athletic or culturally specific examples to ensure that they make sense and appeal to a wide audience.

Implications for Practice

This experience has been empowering and eye-opening for me, and as I share it I encourage others to engage in a similar practice of action research self-study. It is through reflection on current practice that we grow as educators. However, as a district leader, self-study is only the first step. Other pertinent information must be obtained to fully evaluate professional learning. Guskey (2002) suggests that one must consider participants' reactions to professional development and then determine whether they "acquired the intended knowledge and skills" and can apply them effectively (p. 48). Moreover, questions must be asked such as, was implementation advocated, facilitated, and supported? Additionally, were sufficient resources made available? (p. 48). Finally, we must look at how student learning is impacted since this is truly why we engage in professional learning. These are areas I plan to analyze moving forward in order to better understand the overall impact of the CLS series.

This action research self-study has driven home my need to commit to a less-is-more approach. In the future, I hope to tailor my content and presentations to follow these points based on McKeown's (2014) *Essentialism* outline:

Explore: To better find appropriate research and data, I hope to invest more time in gathering ONE precise idea and link it directly to student or district data. I'll ask: What is ONE new big idea to share? What is ONE piece of data to back this up?

Evaluate: Filtering from many to few, I want to weigh each element to find the best ONE priority with a single step to move forward. I'll ask: What rises to the top as ONE big idea to explain and focus on during the keynote session? Who can best tell ONE story to fit with specific audiences?

Eliminate: I hope to better cut out, trim down and combine slides to make ONE element. I'll ask: What must be taken out to concentrate on ONE central theme? How can I ensure ONE take-away message?

Execute: I want to find a joyful and empowering atmosphere to support my teams to take ONE action step to practice and refine their learning. I'll ask: How can ONE big idea transfer to 500 educators? How can ONE essential message promote student success in a big way?

Limitations

This study is a small slice of what actually happened during the CLS series keynote presentations. Since the study only looked at slide decks, it did not take into account any of the verbal speech delivery variables like volume, rate, voice quality, posture, gestures, or body movements. It also did not take into consideration audience interactions and feedback loops during the presentations. Finally, professional learning is only one aspect of my role as a district leader.

Conclusion

Using an action research process, I set out on a journey to learn how I could be more effective in impacting districtwide teacher learning in the area of literacy instruction. As a result of the study, my critical friends and I identified seven thematic patterns of communication: promoting a culture of excellence with teacher leaders; modeling engagement and inclusion; wrong use of research; simplicity and focus; intent versus impact, data absence versus abundance; and forcing metaphors versus flipping the message. While I delivered on some areas, like promoting positive district culture, empowerment, and participation; I learned that although my framing of the district message was clear, my rhetorical crafting (Conger, 1991) needs improvement. As I continue to learn and grow professionally, I must find ways to enhance teacher clarity and the inclusion of applicable research and data, along with more universally accepted metaphors to frame our district's common work.

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Our Continuing Instructional Coaching Journey: An Action Research Project

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Abstract: Instructional coaches collaborate with teachers to help them choose and implement research-based interventions that help students learn. This action research project, conducted through a professional development school (PDS) partnership with a local university, used a survey to examine the impact of two instructional coaches on the elementary educators they served. In addition to identifying actions such as in-person promotions and one-on-one conversations that had the most impact, results of the study revealed a need to clarify the instructional coaches' roles and services offered as well as to make changes to the coaching cycle.

KEYWORDS: *instructional coaches, school-university partnerships, professional development, action research*

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.

Throughout our first year as instructional coaches, we (Cynthia and Leslie, the first and second authors of this article) stopped many times to reflect on our actions. With instructional coaches being a new position in our district, educators needed to know who we were and what services we provided in order to access those services. Our job as instructional coaches was to meet the needs of educators in our district, provide them with research-based instructional practices and resources, and help close the district's achievement gap. We used many avenues to share our job description but knew there was room for growth. As we reflected, we realized that to make improvements we needed feedback from educators in our district to determine what was working for them. So, we worked with a professor from the local university, Suzanne (third author), to clarify an action research question, tools, and methods. Monthly, we met with Suzanne to share progress and receive guidance as we carried out our research. It was our goal, through this action research project, to improve our capacity as instructional coaches based on feedback from the educators we serve.

Background and Rationale

Located in the college town of Manhattan, Kansas, Manhattan-Ogden Public Schools has approximately 6,500 students with about 40% classified as economically disadvantaged. The district includes two early learning centers, nine elementary schools, two middle schools, and one high school. The schools vary in size, with the smallest housing approximately 170 students and

the largest approximately 580. The schools also vary in socioeconomic status. Approximately 5% of our students are homeless. Some of our schools have low free and reduced lunch rates while others have up to 75% of their students receiving free and reduced lunch. Our smallest school has the highest percentage of students receiving free and reduced lunch.

At the time of our action research project, our school district had recently adopted a new literacy curriculum called *Wonders* (by McGraw-Hill) and was also implementing Multi-Tiered Systems of Support (MTSS) to support all children in attaining grade-level reading proficiency. To assist educators in their implementation of both programs, a model of instructional coaching was adopted by the school district. As instructional coaches, we served the district's nine elementary schools, containing students from kindergarten through grade six. Our positions were funded through a Konza Literacy Network of Kansas (K-LINK) grant awarded to our district. The literacy grant was focused on the educational success of three target populations: students with English as a second language, students with exceptionalities, and students at risk of educational failure due to low socioeconomic status.

As two of the district's newly hired instructional coaches, we were constantly developing our knowledge and leadership skills to effectively provide relevant professional development to teachers. Through professional reading, attending conferences, and viewing webinars, we were able to grow our knowledge on topics such as dyslexia, best practices in reading instruction, and trauma-informed teaching. We regularly presented on a variety of educational topics during district professional development days, building-led professional development, and staff meetings; we worked with teachers to improve instructional practices through professional development and feedback following non-evaluative observations of lessons; and we met with teachers one-on-one an in grade-level teams to set and achieve self-selected goals. The idea was that as teachers became more effective instructors, students would receive a higher quality of education, increasing their chances of academic success.

Soon, we grew interested in understanding what actions taken by the instructional coaches had the greatest impact. Since this was a new position to our district, we wanted to understand what effect our actions were having on teachers and students so that we could continue what we were doing or adjust our approach accordingly. We also wanted to ensure that we were as effective as possible so that our positions would continue to be funded after the grant ended in three years and we could continue doing work that we view as important and vital to the success and improvement of the schools in our district.

Manhattan-Ogden Public Schools has had a partnership with Kansas State University for over 35 years. This partnership is beneficial to both institutions through sharing of personnel and professional development to support the development of proficient educators. As part of the K-LINK grant, our district chose to encourage educators to take part in action research projects facilitated by KSU professor Suzanne Porath. We decided to work together on an action research project to identify which practices implemented during our first year of instructional coaching were effective and which were not.

The action research group met monthly to work through the action research cycle: 1) identify a question, 2) develop a plan, 3) gather and analyze the data, 4) reflect and take action, and 5) share results (Dana & Yendol-Hoppey, 2014). Although we had both completed action research projects previously, we greatly appreciated Suzanne's feedback and assistance in narrowing our research question, developing our survey, disaggregating our data, and at the

conclusion of the study, determining next steps for year two. Throughout this process we sought to determine the strengths of what we were doing, and weaknesses and problems in our implementation of instructional coaching.

Comparison of the Research Literature and the District's Instructional Coaching Practices

Definition of Instructional Coaching

Knight (2018) defined instructional coaches as professionals who collaborate with teachers to help them choose and implement researched-based interventions to help students learn more effectively. Instructional coaches are knowledgeable about a large number of instructional practices. Instructional coaches were typically teachers who held a master's degree in a specialized field under the umbrella of education. Coaches typically have five or more years of successful classroom experience prior to becoming instructional coaches (Symonds, 2003). In our district, instructional coaches are often selected from within the district because they have already formed relationships with many members of the staff and have shown leadership capability. To stay on the cutting edge of research and best practices in the classroom, instructional coaches in our district receive training and attended conferences regularly.

How Instructional Coaches are Being Used

There are several reasons school districts might employ instructional coaches. For example, in Mangin's (2009) study, students' test scores were an important contributing factor to the district's implementation of instructional coaches. Student scores on the SAT-9, Gates MacGinitie, district assessments, and student grades showed a significant achievement gap between native English speakers and English language learners. The districts studied stated that they believed teachers were more willing to consider new initiatives such as instructional coaches because of the low achievement of student subgroups (Mangin, 2009).

Instructional coaches were brought to our school district for similar reasons. One of the goals written into the K-LINK grant under which we were hired stated that a certain percentage of our student population should score at or above grade level on state and district assessments since student scores are an area of concern to district leaders and educators.

In Symonds' study (2003), three districts in California used coaches as a source of professional development at the building or district level and through coaching in classrooms. Several districts mentioned that hiring an outside curriculum consultant was an ineffective form of professional development because the consultants were unable to support the vast number of educators who needed assistance. Mentors were also found to be minimally effective in creating change in classrooms because, due to their schedules and responsibilities in their own classrooms, they were unable to spend enough time helping struggling and new teachers.

DeMonte's (2013) research also supported the idea that using instructional coaches as a professional development support increases the likelihood that teachers use the tools presented. Because instructional coaches were able to work with teachers on a regular basis rather than in a one-time professional development setting, teachers were more likely to sustain use of best practices in the classroom, which impacted student achievement. Similarly, instructional literacy

coaches in Symonds' (2003) study were used to support teacher instruction, especially new or struggling teachers, and promote research-based instructional strategies and routines.

Our district recommended that we operate in similar ways. During year one implementation, our primary focus was on supporting new or struggling teachers with instructional practices, both during coaching cycles and during professional development. These professional development sessions provided teachers with research-based instructional strategies and routines, mostly focused around literacy. This model of implementation was supported by Symond's study.

Forms of Instructional Coaching

Several approaches to coaching might be used depending on the needs of the teacher. Knight (2018) identified three main approaches to coaching: dialogical, facilitative, and directive. Dialogical coaching, which balances advocacy with inquiry, is considered best practice. Within the dialogical approach, the impact cycle consists of three main parts: 1) educators identify a self-selected goal, 2) the instructional coach and the teacher work together to identify a strategy to accomplish the goal, and 3) the instructional coach and the teacher check in frequently to monitor progress on the goal (Knight, 2018). The impact cycle was the model for instructional coaching that our district selected.

Outcomes of Instructional Coaching

Instructional coaches impact teaching and learning in a variety of ways. According to Symonds (2003), instructional coaches help grow collaborative teacher culture, help teachers become more open to change, increase focus on equity, improve communication between teachers and district leaders, and increase leadership capacity. Symonds' study also showed that literacy coaches were an effective source of professional development for teachers through one-on-one coaching and during professional development sessions as they shared scientifically-based practices and resources. These practices were more likely to be implemented correctly when teachers worked closely with a literacy coach. Practices that are implemented correctly are more likely to have a positive impact on student test scores.

Methods

The purpose of the study was to determine educator perceptions of instructional coaching in our district to improve our capacity as instructional coaches.

Data Collection

During the 2018-2019 school year, near the end of our first year as instructional coaches, we sent out a survey to all nine elementary schools in the district. The survey was anonymous to maintain the relationships we had built with educators during year one of implementation. The survey had 13 questions. The four categories of questions were services we offer, who we are and when we were in each building, experience with instructional coaches, and recommendations on how we could improve in year two. All four categories contained one or more forced answer

questions, including multiple choice and Likert-style questions. Educators were asked to answer some open-ended questions about their experiences with instructional coaches and make recommendations on how we could improve in the future.

The survey was sent via district email. Respondents were given notice of informed assent at the beginning of the survey, stating that the risks of the survey were low, participation was voluntary, and all answers were confidential. Of the 324 educators in the nine elementary schools, 123 responded, for a return rate of 40%. The respondents were a blend of classroom teachers, specialist teachers, Title 1 reading teachers, English as a second language teachers, special education teachers, administrators, and paraeducators, with the majority of respondents being classroom teachers.

Data Analysis

To analyze the forced answer questions, we disaggregated the data based on category, answer type (positive or negative), and identified misconceptions. To analyze the open-ended questions, we read through the teachers' responses and categorized them by positive and negative association with instructional coaching. We highlighted keywords to code the responses and determine patterns and commonalities. Once we started highlighting, outliers and patterns became clearer.

Results and Discussion

Overall, both the forced answer and the open-ended responses showed that our impact on educators in our district during year one implementation was positive, but we still have some work to do in year two.

Forced Answer Responses

Who can instructional coaches work with? Throughout the year, we had explained to educators the populations instructional coaches serve in the district. We wanted to know whether this message had been clearly communicated. Which of the following people can instructional coaches work with? was a forced entry question where respondents were asked to select all answers that apply. As instructional coaches, we can work with classroom teachers, special education teachers, paraeducators, and specialist teachers; but not with parents. One hundred percent of our respondents correctly identified that we work with classroom teachers while only 56% stated they thought we could work with paraeducators. Surprisingly, 26% of respondents incorrectly identified parents as a population instructional coaches serve. We also noted that 87% of respondents thought we were able to work with specialist teachers, including PE, music, art, and STEM.

When are instructional coaches available? We also wanted to determine our impact on educators' knowledge of our presence in their buildings. We asked, do you know who your instructional coach is and when she is in your building? We were pleased to discover that 91% of educators surveyed knew who we were, while 9% claimed they did not. Of those 91%, only 20% responded that they did not know what day we were scheduled in their buildings. One hundred percent of participants responded that they could contact the instructional coach assigned to their

building via email. Fewer responded that they could contact us through text or phone call, both of which are contact options for instructional coaches in our district. While we are glad all respondents knew how to contact us, the survey responses conveyed that there is still some work to be done surrounding relationship building with educators in our district.

Would you consider using an instructional coach? It was important for us to note what approximate percentage of educators in our district had accessed services from an instructional coach through coaching cycles and professional development. The data revealed that 51% of respondents used an instructional coach in year one implementation and 49% had not. We were glad to see that over half of respondents had accessed an instructional coach. Moreover, responses to the question, would you consider using an instructional coach in the future? were favorable, with 83% of respondents stating yes, they would.

Why haven't you used an instructional coach? We then asked respondents who had not yet accessed an instructional coach, why they had not. Fourteen percent of respondents who had not accessed an instructional coach stated they didn't feel they needed one. An additional 9% of respondents stated they didn't have enough time to meet with an instructional coach, and another 9% stated they did not understand the services offered by instructional coaches. The remaining 18% of respondents selected 'other' and typed their responses, which varied from forgetting we were a resource to feeling overwhelmed at the potential workload of working with an instructional coach.

Open-ended Responses

Confirmation of effective instructional coaching services. The first open-ended question of our survey asked those surveyed in what capacity, if any, had they worked with an instructional coach. Most respondents stated that they had collaborated with, been observed by, or worked on best practices with an instructional coach. Specific teaching areas were mentioned quite frequently, especially small group reading instruction and classroom management. One educator stated, "My instructional coach has taken videos of my teaching. She has given feedback and suggested instructional strategies that would improve my teaching. She has also come in to observe and give advice." Another respondent said:

> She has helped me grow as a teacher in so many ways. She has given me lots of ideas for my literacy time. I look forward to having her observe me in the future so we can brainstorm even more ideas.

Others stated that we had provided materials and resources. A few misconceptions were listed, including a response that one of us took an MTSS group for math each day. Overall, experiences were positive and fit into the scope of what we provide.

In-person promotional presentations. In year one implementation of instructional coaching, we vigilantly sent out information to educators and administrators about what instructional coaches offer. At the beginning of the school year, we emailed a PowToon video and our instructional coaching menu to all employees in the district. Throughout the year, we frequently posted opportunities and information about instructional coaching on our K-LINK social media sites and presented at various professional development and faculty meetings.

To determine the impact of these actions, we asked respondents what promotions they remembered seeing. Twenty percent of respondents said they had seen our PowToon video, 47%

had seen the coaching menu, 60% had heard about coaching through a district presentation, 70% learned about coaching during a faculty meeting presentation, and 55% said they followed or had viewed K-LINK social media. Based on this data, we were able to determine that in-person presentations had the biggest impact on educators in our district.

Overall positive experiences. We wanted to know more about how those who had worked with instructional coaches felt about their interactions with us. We used a scaled survey question, if you have used an instructional coach, how has your experience been? Of those who have worked with an instructional coach, 66% responded that their experience was excellent, 28% said they had a good experience, 5% said they had an okay experience, and 2% (one respondent) said she did not have a good experience working with an instructional coach.

When asked to elaborate, those with positive experiences shared that we were reliable and helpful, that we supported them, and that we were knowledgeable. For example, one educator stated, "I have loved working with my instructional coach. She has given me strategies that work, and I have seen improvement in myself as an educator because of my interactions with her." The one negative response described that one of us was rude and unwilling to help. Overall, it seems we had positive interactions with educators throughout the district with one outlier. This was an area where we were intentionally striving for improvement, but we were generally happy with the results after year one.

Misconceptions about instructional coaching. The types of interactions educators have had with instructional coaches helped us evaluate the effectiveness of our instructional coaching program. Of those who had interacted with an instructional coach, 45% had collaborated with a coach, 27% had resources provided to them by a coach, 66% had a conversation with an instructional coach, 31% had a consultation with a coach either in person or via email, and 31% had not interacted with an instructional coach. We were not satisfied that 31% of educators in our district had not interacted with us in some way during year one. If we do not reach as many educators as possible, we cannot effectively help create change for students. The more educators we touch, the more students we touch.

Almost all educators surveyed understood three services instructional coaches in the district provide: instructional strategies, collaboration, and providing resources. About 50% knew that we could video record lessons and set professional goals. This was about the same percentage as those who have used an instructional coach during the year. Likely the respondents who correctly identified setting professional goals and video recording lessons were also those who had worked with us during the year. However, a few misconceptions arose. Four respondents said they thought we supervised students when the teacher was absent, and twelve respondents said they believed we evaluated teacher performance. Neither of these statements is accurate. While most educators understood some of the services we offer, it was clear that there was still work to be done in this area.

Ideas for improvement in year two. To determine how we could improve in year two, we also asked respondents to suggest services we could offer that we weren't already offering. Answers varied greatly. It was evident that some respondents did not understand our positions, suggesting we offer services outside our responsibilities as instructional coaches. For example, one educator suggested that we take an MTSS group for reading and create a home-to-school engagement piece. One respondent suggested that our salaries could be spent to hire more classroom teachers to solve the issue of overcrowding. Several suggestions included services we

were already offering. Additionally, more than one educator suggested we make more of an effort to introduce ourselves to people in the district. We appreciated the candor the educators showed and began making plans right away to implement as many of their suggestions as possible during year two of implementation.

Plans for Year Two

As we move into year two, we are already making plans for improvement based on the survey results. The survey data suggest that our in-person presentations and one-on-one conversations had the biggest impact on educators. This model of providing teacher professional development is supported by research from DeMonte (2013) and Symonds (2003). Since our goal is increasing student achievement gains, we will continue our current practices of presenting professional development and following up with teachers during coaching cycles. We also have come up with a plan to make our identities and presence known throughout the district by sending out an *All About Me* letter to our respective schools that includes a photo of each of us. Our hope is that this letter will provide some personal information about each of us and help educators recognize who we are when we are in their buildings.

Increasing our initial case load will be another change in year two. To start this school year, we will be checking in with the teachers we worked with during year one as well as with new-to-the-district and first year teachers to determine what these educators would like to work on during the new school year. This will significantly increase our caseload at the beginning of the year. Our hope is to stay as busy as we can so that we can help implement change and professional growth for both veteran and new teachers. We know that the more we can help educators grow professionally, the greater the likelihood they will have a positive impact on their students.

Limitations

The results of our action research project are specific to our school district. The ideas and insights reported may or may not be applicable to other settings.

Conclusion

This action research project has allowed us to better understand the experiences the elementary educators in our district have had with us as instructional coaches. We found that our in-person efforts made the most impact on teachers. We were also pleasantly surprised to find that most educators knew who we were and that, in general, those we had worked with had favorable remarks. Even the negative responses allowed us to identify ways in which we could change and grow in year two. Our goal throughout this continuing instructional coaching journey is to ensure we are making a positive impact on teachers as they continue to grow professionally. If we can help our teachers grow, they can help our students grow!

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The Influence of Teacher Leadership on Elementary Students in an Urban Professional Development School (PDS)

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Abstract: The connections between teacher leadership and student learning have not been widely explored in the literature. Responding to this absence, the purpose of this longitudinal collaborative inquiry was to understand the interaction and influence between and among teacher leaders and students within an urban, turnaround elementary professional development school (PDS). Our inquiry examined data from a five-year period to explore how teacher leaders are influencing students in terms of opportunities for student leadership, students' perceptions of the school, and student achievement as measured by state standardized test scores. The study revealed that since the launch of a teacher leader academy at the school in 2013, student academic achievement has improved, students' perceptions of the school climate and their teachers have improved, and student leadership is occurring in a variety of ways throughout the school.

KEYWORDS: *collaborative inquiry, professional development schools (PDS), student leadership, teacher education, teacher leadership*

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
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

Teacher leadership is the ability of teachers to positively influence change within their peers' practice to improve student learning (York-Barr & Duke, 2004), and it is receiving heightened attention nationally. The terms teacher leader and teacher leadership are not synonymous; one is a function (teacher leadership) and the other a role (teacher leader) (Burns, 2018). The seminal work of York-Barr and Duke (2004), who reviewed the empirical literature on teacher leadership, found that research focused on characteristics and practices of teacher leaders as well as on challenges that teacher leaders encountered within their schools. Building upon this work, Wenner and Campbell (2017) found that more recent empirical literature on teacher leadership focused on the roles of teacher leaders outside of the classroom. They also identified several key factors that could empower or inhibit teacher leader development. Both of these literature reviews agreed that teacher leadership remains uncommonly defined and not grounded theoretically in research studies.

While scholars have sought to understand teacher leadership broadly in schools, several scholars are exploring teacher leadership in the specific context of professional development schools (PDSs). In her edited book, Hunzicker (2018) compiled descriptions and studies of teacher leadership in PDSs from across the United States. Authors within her text address connections between teacher leadership and student learning, structures, and cultures that promote teacher leadership, and the preparation and development of teacher leadership in PDS contexts. In addition, other scholars have recognized that exemplary PDS contexts can be sites for cultivating teacher leadership (Nolan et al., 2009). What these scholars share in common is the recognition that PDSs, as robust school-university partnerships, are excellent hybrid spaces for cultivating teacher leadership and for developing teacher leaders, but much less is known about teacher leadership and its influence on students, student leadership, and student learning.

In this article, we explore the connection between teacher leadership and student learning in an urban turnaround elementary PDS called Hope Elementary, hereafter referred to as Hope. A group of university research faculty, doctoral students, teacher leaders, and school administrators engaged in collaborative inquiry to address the following overarching research question:

- How are teacher leaders influencing K-5 students at Hope?

Our sub-questions included:

- What opportunities for student leadership are present at Hope?
- How do teacher leaders interact with students to support those opportunities?
- What are students' perceptions of the school culture and climate and of their teachers specifically?
- How have those perceptions changed over time since the inception of teacher leadership at Hope?
- How have students performed on state standardized tests since the inception of teacher leadership at Hope?

Relevant Literature

In order to explore the connection between teacher leadership and student learning in our PDS, we drew from the empirical literature between the intersecting topics of student leadership and academic success, teacher leadership and student learning, school culture and student learning, and PDSs and student learning.

Student Leadership and Academic Success

Student connectedness is an important predictor of academic success (Libbey, 2004; Lizzio, Dempster, & Neumann, 2011). Both formal and informal student leadership opportunities offer possibilities for strengthening student connectedness with school, whereby students have various ways to be engaged as leaders in both academic and extracurricular activities (Lizzio et al., 2011). Student leadership also presents opportunities for enhancing student voice and for empowering students within their school context, which have been found to be beneficial both to students themselves and to a school and its community (McQuillan, 2005; Quinn & Owen, 2016). By participating in student leadership opportunities, students have been found to "develop skills of communication, negotiation, active listening, facilitation of discussions and delegation of responsibilities to accomplish their goals" (Quinn & Owen, 2016, p. 67).

Teacher Leadership and Student Learning

In a recent review of the theoretical and empirical basis of teacher leadership, Wenner and Campbell (2017) found no research examining the impact of teacher leadership on student learning, despite a call for this need over a decade ago by York-Barr and Duke (2004). They problematize this omission, pointing out that a commitment to student learning is often embedded within definitions of teacher leadership, and that the current climate of accountability makes it even more necessary and relevant. Wenner and Campbell (2017) appealed to researchers to explore connections between teacher leadership and student learning in order to address this gap in the literature.

School Climate and Student Learning

Student academic growth and achievement have been found to be linked to a positive school and classroom climate (Thapa, Cohen, Guffey, & Higgins-D'Alessandro, 2013). Thapa et al. (2013) demonstrate that a wide body of research points to the overlap between a positive school climate and various academic factors, including higher graduation rates, growth in academic achievement, and increases in students' school connectedness and engagement. Additionally, positive student-teacher relationships have been found to be connected to student academic achievement. For example, Hamre and Pianta (2001) found 'relational negativity' in kindergarten predicted students' later academic outcomes. Similarly, Reyes, Bracket, Rivers, White, and Salovey (2012) found both direct and indirect links between student academic achievement and the classroom emotional climate, including the quality of interactions between students and teachers.

Professional Development Schools and Student Learning

Since the conceptualization of PDSs in the mid-1980s, scholars, practitioners, and policymakers alike have wondered what the connection between PDSs and student learning would be. After all, the intention of PDSs was to be a vehicle for simultaneous renewal - a grassroots movement where schools and universities would collaborate to transform schools and universities

together (Goodlad, 1994; Rutter, 2011). Many scholars have attempted to explore the impact of PDSs on student learning, but have been unsuccessful. In fact, in 2011, Jane Neapolitan published an edited yearbook, *Taking Stock of Professional Development Schools: What's Needed Now,* to tackle the idea of impact. Scholars from across the United States searched the empirical literature seeking to find the impact of PDS on teacher professional learning, student achievement, and more, but the empirical evidence connecting PDSs to student learning was sparse and inconclusive. Researchers today continue the quest to address this highly sought-after correlation of PDS impact on student learning.

Theoretical Frameworks

Perhaps one of the reasons that the question of PDS impact on student learning has escaped researchers is a flaw in the conceptualization of what a PDS is. For the purposes of our study, we draw upon hybridity theory and complexity theory to reframe research in and on PDSs and PDSs themselves.

PDSs as Hybrid, Third Spaces

Hybridity theory suggests that when two binaries interact, they negotiate and renegotiate their identities (Bhabha, 1994). Over time, this negotiation and renegotiation present opportunities for knowledge generation and innovation, thus creating a new, third space from the original binaries (Soja, 1996). When applying that idea to PDSs, they exist as robust communities created through the negotiation and renegotiation of two binaries, schools and universities. Thus, PDSs are a unique third space where the culture of schools and the culture of universities collide, clash, and co-mingle to foster the theory and practice connections, innovative thinking, knowledge generation, and educational renewal (Cuenca, Schmeichel, Butler, Dinkelman, & Nichols, 2011; Zeichner, 2010).

PDSs as Complex Entities

PDSs have historically been criticized for their lack of fidelity (Teitel, 1998). Thus, the National Association for Professional Development Schools (NAPDS) (2008) created the PDS Nine Essentials to distinguish PDSs from other school-university partnerships. Likewise, *School-University Partnerships*, the journal of the NAPDS, recently dedicated an entire issue to address the concept of PDS (Zenkov, Parker, Parsons, Bruyning, Clark, & Daoud, 2016). Within that issue, Dresden, Blankenship, Capuozzo, Nealy, and Tavernier (2016) drew upon Deleuze and Guattari's cultural historical activity theory (1987) to argue that PDS work is complex, "Each PDS is a unique assemblage of specific people, places, buildings, policies, geographies, furniture, attitudes, and climate" (p. 73).

Other scholars have applied such theories to studying novice teachers and teaching. Strom (2015) also used Deleuze and Guattari's theory and applied their metaphor of a rhizome to her study of a first-year teacher, arguing that this rhizomatic theoretical framework allowed her to resist reductionist notions and instead embrace the complexity of teaching as non-linear, non-hierarchical interactions that shaped the research participant and her teaching as she shaped them.

Davis and Sumara (2006) have also advocated for the use of complexity thinking in educational research. They contend that complex systems have a fractal geometrical structure, in essence, a structure that repeats itself, but complex systems' personalities or characters are unique, shaping and being shaped by the individuals and socio, cultural, and political contexts in which they are situated. Like these other scholars, Davis and Sumara (2006) strongly advise researchers to use non-linear thinking to address complex educational phenomena, like PDSs.

When PDSs themselves, and not just the work of PDSs, are reframed using the lens of complexity thinking, it becomes easier to see why linear, cause and effect correlations desired in impact research have been scant at best in the PDS literature. Perhaps we are asking the wrong questions and need to reframe the conversation and the research to embrace complexity (Dresden et al., 2016). Thus, our longitudinal collaborative inquiry does not seek to understand a direct causal link between teacher leadership and student learning. Rather, we aim to understand the interaction and influence between and among teacher leaders and students within our urban, turnaround elementary PDS.

Context

Hope Elementary (a pseudonym) is a PDS between the Colossal School District (a pseudonym) and the Urban Research University (a pseudonym) in the southeastern United States.

Hope Elementary

Hope is one of the largest K-5 elementary schools in the Colossal School District with around 850 students on average. Labeled as a turnaround school from the state department of education, Hope faces many challenges similar to other urban, high-poverty, low-performing schools that serve children and families living in poverty. Ten percent of the children are homeless, and even more are shelter insecure. A majority of the students are food insecure. In fact, almost all (97%) students receive free and reduced lunch. Many families are migrant workers or undocumented immigrants, which means that many parents regularly move to seek work to support their families, resulting in a high transience rate; about 50% of the student body turns over each year. The student population is predominantly composed of students of color and, more specifically, a Latinx population (over 70%). There are over 100 staff members. Approximately 60 are considered instructional staff. Hope has one principal and two assistant principals, and the school is the only PDS among six partnership schools with the Urban Research University's urban residency teacher preparation program. Being a PDS means that the instructional staff at Hope agrees to mentor 12 to18 teacher candidates each year for a two-year period. Teacher candidates, called residents, accumulate almost 2,000 clinical hours by graduation, so having teacher leaders who can serve as high-quality mentor teachers to residents is imperative.

Colossal School District

Colossal School District is in the top ten largest school districts in the United States. The district is comprised of over 250 K-12 instructional sites. Approximately 150 of them are

elementary schools. There are over 30,000 employees and almost 200,000 K-12 students enrolled in any given year.

The Urban Research University

The Urban Research University (URU) is a large urban research-intensive university in the southeastern United States with over 45,000 students. Within the university, the College of Education has 115 full-time faculty, over 75 degree programs, and more than 2,500 students. The university's as well as the college's strategic plan includes a focus on school-university partnerships and community engagement.

Teacher Leadership at Hope

In the fall of 2013, Hope's principal at the time and a URU faculty member collaborated to develop the Hope Teacher Leader Academy, an innovative, clinically-centered program for developing teacher leaders to support the renewal of Hope. The goal of the academy is to develop teacher leaders who can: (1) systemically study their own practice by developing critical data literacy skills, (2) effectively coach teacher candidates and in-service teachers to improve student achievement, (3) skillfully facilitate professional development to enhance instructional practice, and (4) intentionally develop a lens of equity to recognize, respond to, and redress educational inequities to ensure that all students at Hope have equal access and opportunity to education.

As a part of the initiative, teacher leaders earn advanced credentials through courses co-taught by university faculty, doctoral students, and school representatives onsite at the school. The issues and challenges of leading at Hope become the curriculum for graduate coursework. Today, teacher leaders collaboratively design and facilitate the professional learning of the rest of the staff, and their ability to successfully influence their peers' practice to improve student achievement has become their performance assessments for the graduate coursework. In this way, professional learning at Hope is data driven, responsive, and differentiated to meet the needs of the entire staff in ways that recognize and value teacher expertise.

The PDS Structure

The design of the PDS among Hope, URU, and Colossal School District is very sophisticated. It has a six-building block structure that aligns with the NAPDS Nine Essentials (NAPDS, 2008) to foster simultaneous renewal and address the professional learning for all stakeholders: (1) Teacher Candidate Learning, (2) Teacher Learning, (3) Teacher Leader Learning, (4) University Teacher Educator Learning, (5) School Administrator Learning, and (6) Student Learning. For the purposes of this article, we will be targeting building block three, Teacher Leader Learning, to understand the influence teacher leadership has had on K-5 students over a period of five years. Hope has won several national and state awards for school-university collaboration and its achievements in teacher leadership development, school culture and climate transformation, differentiated professional learning, and student achievement.

Methodology

In this study, we used collaborative inquiry as our methodological approach to engage a voluntary group of school-based and university-based faculty in studying teacher leadership at Hope. Collaborative inquiry is situated within practice-based research. It is a form of practitioner research and is defined as the systematic, intentional study by educators of their own practice (see Cochran-Smith & Lytle, 1992; 2009). During the last few decades, the area of practitioner research has enjoyed heightened attention as a powerful tool for teacher candidate, in-service teacher, and principal learning (e.g., Cochran-Smith & Lytle, 1993, 2009; Dana & Yendol-Hoppey, 2014; Price & Valli, 2005). This longitudinal collaborative inquiry examined data from a five-year period to explore how teacher leaders are influencing students in terms of opportunities for student leadership, students' perceptions of the school, and student achievement as measured by state standardized test scores.

Methods

Members of our collaborative inquiry team consisted of a research faculty member and professor-in-residence, a doctoral student, three teacher leaders, and two administrators. To understand our ability to influence student learning through teacher leadership at Hope, we drew from a variety of data sources. To analyze the data, we used an ongoing, recursive process that we describe through three phases of analysis.

Data Collection

We collected four types of data: (1) discussion notes, (2) artifacts, (3) surveys, and (4) student achievement data from state standardized tests from 2013-2018.

Discussion notes. Members of the collaborative inquiry team discussed instances that they saw of student leadership and teacher leaders supporting students in the school to generate a list of activities, both formal and informal, of teacher leaders positively influencing students.

Artifacts. To capture student leadership opportunities, we examined the school calendar. We also collected programs, flyers, agendas, etc. where students had opportunities to enact leadership. Using this information, we created a timeline of student leadership opportunities over the past five years.

Surveys. There were two kinds of surveys. The first survey, called the School Climate and Perception (SCIP) survey, is an anonymous survey used annually across the district to understand student perceptions of school and related factors. The Student SCIP survey is divided into five categories with several indicators in each category. The five categories include: My School, My Teachers, My Principal, My Home, and My Experience. Under each of these categories, students are asked to what extent they agree with various statements, such as, "My teachers make sure our class stays focused on learning." For the purposes of this study, we isolated the SCIP survey indicators related to teachers, leadership, and student experiences, and we used those responses as data. The SCIP student survey was significantly changed during the 2015 school year, resulting in a new format and almost all new indicators; therefore, the survey from previous years was not

included in our data analysis because the significance of the differences made it impossible to compare.

The second survey was a short, five open-ended question response to ascertain teacher leaders' perceptions about their opportunities and experiences with supporting students in student leadership. The survey was sent to twenty-eight people (teacher leaders and school administrators). Eight people responded. Questions included: (1) How do teacher leaders positively influence students at Hope? (2) What are some opportunities for student leadership at Hope? (3) How do teacher leaders encourage/support student leadership at Hope? (4) Give a concrete example of a time when you (when you saw a fellow teacher leader) support/encourage students to be leaders at Hope? And (5) Is there anything else that you would like to share that we didn't think to ask?

Student achievement data. Finally, we examined student achievement scores, not disaggregated by student, in math, literacy, and science as well as the school's annual grade as issued from the state department of education from 2013 to 2018. We analyzed data from the annual state standardized assessment to understand student achievement. The annual state standardized assessment is given to elementary students in grades 3 through 5 to assess their math and literacy achievement. The science standardized assessment is only taken by students in grade 5. Students' level of proficiency is reported using a scale score ranging from level 1 (inadequate) to level 5 (mastery). The state considers level 3 or above to be a passing score. Therefore, we identified the total percentage of students achieving a level 3 or above in each of the subject areas (math, literacy, and science) to understand student academic achievement over time. Importantly, the state standardized exam was significantly changed in 2015 in order to align with the adoption of new standards. Because of this, achievement data prior to 2015 is not necessarily equally comparable to data from 2015 and beyond.

Data Analysis

Our data analysis occurred in three phases: (1) Coding qualitative data, (2) Analyzing survey data, and (3) Examining the "Big Picture."

Phase 1: Coding qualitative data. For qualitative data, like the open-ended survey questions, discussion notes, and artifacts, we used coding and categorizing to make sense of the data. Coding is the process of assigning a word or phrase to capture the essence of a datum (Saldaña, 2009). After the data were coded by hand, we grouped the data into categories. Then, we used these categories for analysis in Phase 3 when we combined qualitative and quantitative data.

Phase 2: Analyzing SCIP survey data. For the student SCIP survey, which included only Likert scale responses, we examined the percentage of positive responses for particular indicators connected to teachers, leadership and student experiences. We placed these percentages into tables for each of the years analyzed. Then, we compared the percentage of positive responses for identical indicators across the years to examine change over time.

Phase 3: The big picture. Our final phase of analysis included combining the analyzed qualitative and quantitative data from Phases One and Two to develop a holistic picture of the influence of teacher leadership on K-5 students. We looked across both data sources to develop themes, which Saldaña (2009) defines as, "...an *outcome* of coding, categorization, and analytic reflection, not something that is, in itself, coded" (p. 13).

Findings

We have organized our findings based on the sub research questions to address the opportunities for student leadership and the influence of teacher leadership on those opportunities, students' perceptions of the school climate and how those perceptions have changed over time, and how students performed on state standardized tests since the inception of a long-term teacher leadership initiative at Hope.

Research Question 1: What opportunities for student leadership are present at Hope?

One of the main opportunities for student leadership is the school government initiative called CASA. Although CASA stands for Character. Attendance. Service. Academics, *casa* also means "home" in Spanish. With a majority of the student population being Latinx (over 70%), Hope is really like their second home. Students earn points, which can never be taken away, for exhibiting behaviors that exemplify character. What defines character is identified in the school's 22 Essentials (a list of twenty-two behaviors that should be seen and heard in the school). According to a 12-page school document that describes the CASA program, the 22 Essentials are the expectations that are "...not only preparing students for Hope but are preparing them for LIFE." Students also earn points for coming to school and being on time. The school has historically struggled with attendance, which is connected to the high transience rate. Almost all students walk, so getting students to school on time and safely across a four-lane major road is a persistent challenge.

The CASA program, among other initiatives, has helped to improve the attendance rate. All students and teachers are mixed and divided into five houses, each which has a color and animal assigned to it: (1) The House of Determination (Green Raven), (2) The House of Respect (Yellow Eagle), (3) The House of Loyalty (Black Wolf), (4) The House of Courage (Blue Lion), and (5) The House of Respect (Red Badger). Each house has a Head of House (President), Vice President, and Historian. To be selected into one of these roles is a very rigorous, and often nerve-wracking, process that involves applying, running for the position, and giving a speech to the entire house. These roles comprise the House Council and student leaders lead monthly House meetings, serve as hosts to visitors, lead school tours, and serve as peer mediators. These are highly sought after roles for student leadership.

In addition to the CASA program, student leadership is encouraged and supported in a variety of ways at Hope. Leadership opportunities and experiences for students exist both inside and outside the classroom, and in both formal and informal ways. In their classrooms, many teachers create and implement different types of "classroom jobs" for students, such as table team leaders, conversation facilitators, homework collectors, etc. These positions offer students opportunities to begin understanding leadership and responsibility in various formats within the safe spaces of their classrooms.

Other initiatives offer the potential for students to begin exhibiting leadership outside of the classroom. For example, fourth and fifth-grade students at Hope engage in an annual Tropicana Public Speaking Contest. Teachers support students as they develop speeches and give them in front of their class; then, top students are selected to engage in the school-wide contest. Winners of this contest go on to compete in a district-level competition. Through this contest, students learn

to write speeches on topics that matter to them and to develop their public speaking abilities. Additional ongoing student leadership opportunities include National Elementary Honor Society membership, hosting the school's talent show, working as a school "safety patrol" to help with the school dismissal process, involvement in the [Hope] News Channel, and working in the school's garden to care for the plants and chickens. Students are selected for these various opportunities through applications, auditions, and/or nominations. Each of these opportunities is supported by one or more Hope teachers, who have either created the initiative or have volunteered to oversee its functioning and mentor students through the experience.

Research Question 2: How do teacher leaders interact with students to support those opportunities?

Teacher leaders felt that they supported students and student leadership at Hope by being role models. The words "role model" or "model" appeared in 63% of the open-ended survey responses. One teacher leader wrote, "Teacher leaders help influence the students at Hope because we model for them how to be leaders in the classroom." Teacher leaders felt that in order to cultivate student leadership, students needed to see leadership in action; thus, teacher leaders believed that they needed to, and were, "leading by example."

Another way teacher leaders supported students and student leadership was through statements of affirmation and support. Words like "encouragement" and "encouraging" appeared in 50% of the responses. One teacher wrote, "Teacher leaders encourage and help when needed." Several teachers gave examples of specific ways they supported student leaders, and the majority of responses referenced teacher leaders supporting student leadership within the CASA program. For example, teacher leaders helped students develop campaigns and speeches when they wanted to run for office in the CASA program. One teacher shared how she encouraged and supported a student to run for office, "A student did not think they were 'outgoing' enough to run for CASA president. We practiced speaking in front of my class and on my lunch breaks so she would be ready and feel more confident...She won!" Another teacher had a similar experience. This teacher wrote:

I had a student that ended up having a leadership role in the CASA program. She came to my classroom to visit me before the elections to tell me she was nervous and scared. I gave her some encouraging words and told her how proud of her I was.

Running for office was a big deal at Hope and the rigorous process evoked a lot of emotions from students. Teacher leaders used encouraging words, and they practiced with students to alleviate students' nervousness, anxiety, and stress.

Once students were elected, a few teacher leaders mentioned encouraging, mentoring, and developing leadership skills in House officers as a way teacher leaders influence student leadership. One teacher shared:

I worked with the president, vice president, and historian of the Red House each week to create agendas for our house meetings. The students and I discussed topics to bring up, and also how they needed to address the house and the students in it.

Teachers donated their own time, often before and after school or during lunch or their planning periods, to nurture students as leaders, "As CASA house leader, I met with our student leaders to plan for meetings so they will be prepared. I met with them sometimes after school or during lunch

when we have upcoming events." Another teacher said, "Every Monday morning during house meetings, every student that represented that house met to discuss the agenda."

A few responses suggested that teacher leaders supported student leadership through instructional activities. One primary teacher shared how she utilized intermediate students to mentor her students, "As a primary teacher, I often use intermediate students to mentor some of my students with more challenging behaviors or situations." Another teacher described how she witnessed student leadership in action in her classroom during a House meeting:

> I have witnessed fourth-graders reading cards and asking probing questions to the first graders. I have seen students sharing examples and non-examples and discussing why their answer is valid. It is a powerful conversation building skill that obviously happened in the classroom that was transferred into this wonderful but respectful debate. I was just a spectator in all of this and that was the best part.

These examples show how teacher leaders support student leadership through academics and student mentoring.

Research Question 3: What are students' perceptions of the school culture and climate and of their teachers specifically? And how have those perceptions changed over time since the inception of teacher leadership at Hope?

Tables 1, 2, and 3 provide students' percentage of agreement with various indicators on the Student SCIP survey in three categories: My School, My Teachers, and My Experience. These tables include data from 2015 and 2018, as well as the percent change between these two years. The year 2015 is used as the baseline because the Student SCIP survey prior to 2015 was significantly different, making it impossible to compare to the survey given in 2015 and beyond. As these three tables demonstrate, students' overall perceptions of their school, teachers, and experiences have improved since 2015.

As Table 1 demonstrates, the average percentage of agreement in the category My School increased from 74.6% in 2015 to 81.6% in 2018, an increase of seven percentage points. Additionally, the indicator "I have lots of ways to be involved at school" increased almost 24% since 2015, aligning with our other qualitative data that expands upon the wide variety of opportunities students have to engage in leadership roles and various experiences both in and outside of their classrooms. Two areas in this category have declined since 2015, pointing to the need for attention around these particular areas: I feel safe at school and I enjoy coming to school.

Indicator	Hope 2015	Hope 2018	2015 to 2018 Difference
MY SCHOOL (composite)	**74.6%**	**81.6%**	**7.0%**
There is an adult I can talk to if I have a problem.	81.7%	90.3%	8.6%
I feel safe at school.	72.1%	69.7%	-2.4%
I enjoy coming to school.	78.5%	73.9%	-4.6%
I am not bullied at school.	71.4%	80.6%	9.2%
I have lots of ways to be involved at school.	69.4%	93.3%	23.9%

Table 1: Student SCIP Survey Data: My School

Higher percentages of agreement are seen in the My Teachers category in 2018 than in 2015 in all indicators but one, resulting in an overall increase of 1.4 percentage points in this category (see Table B). Although this category has had generally high percentages of agreement since 2015, this slight growth demonstrates the ongoing and increasing success of Hope teachers in ensuring that students feel cared for and provided with important academic support. Students at Hope recognize that their teachers want them to do their best (97.6%) and that they make sure the class stays focused on learning (94.5%). The majority of students also agree that teachers use different activities to help them learn (93.9%), teachers require them to work hard (93.3%), teachers help them correct mistakes (90.9%), and teachers keep them informed about their progress (84.8%). Most students perceive that their teachers care about them (89.7%), despite the slight drop in this indicator (-0.2%) since 2015.

Indicator	Hope 2015	Hope 2018	2015 to 2018 Difference
MY TEACHER(S) (composite)	**90.7%**	**92.1%**	**1.4%**
My teachers care about me.	89.9%	89.7%	-0.2%
My teachers want me to do my best.	96.3%	97.6%	1.3%
My teachers use different activities to help me learn.	91.8%	93.9%	2.1%
My teachers help me to correct my mistakes.	86.1%	90.9%	4.8%
My teachers require me to work hard.	N/A	93.3%	N/A
My teachers make sure our class stays focused on learning.	89.2%	94.5%	5.3%
My teachers keep me informed about my progress.	N/A	84.8%	N/A

Table 2: Student SCIP Survey Data: My Teachers

Table 3 demonstrates that students' perceptions of their experiences have become more positive (+10.8 percentage points) since 2015. Hope students recognize that their principal and teachers help prepare them for the next grade level (95.2%), and an increasing percentage of students agree that they are planning to go to college (84.8%). Additionally, students' percentage of agreement with the indicator "My principal and teachers ask me what I think about school" has increased 32.5% since 2015, from 34.2% to 66.7%. New indicators included on the 2018 survey also demonstrate that students are proud to attend their school (86.7%) and that they are encouraged to show good character (82.4%). Overall, although several indicators in this category have room for ongoing improvement, these data demonstrate students' increasingly positive perceptions of their school experiences.

Indicator	Hope 2015	Hope 2018	2015 to 2018 Difference
MY EXPERIENCE (composite)	**74.3%**	**85.1%**	**10.8%**
I am proud to attend this school.	N/A	86.7%	N/A
I can get help if I need it.	80.1%	N/A	N/A
I have a mentor or someone who helps me succeed.	N/A	79.4%	N/A
My principal and teachers ask me what I think about school.	34.2%	66.7%	32.5%
My principal and teachers help me to be ready for the next grade.	92.9%	95.2%	2.3%
My school uses computers to help me learn.	96.3%	97.0%	0.7%
I am encouraged to show good character.	N/A	82.4%	N/A
I am planning to go to college.	74.7%	84.8%	10.1%
I am planning to graduate from high school.	N/A	96.4%	N/A
I know how to report bad behavior.	N/A	77.0%	N/A

Table 3: Student SCIP Survey Data: My Experience

Research Question 4: How have students performed on state standardized tests since the inception of teacher leadership at Hope?

Table 4 provides the percentage of students achieving a score of level 3 or above on the state standardized exam (considered to be a passing score) in each subject area from 2012 to 2018, as well as the school grade as determined by the state. Although the state standardized test was significantly different prior to 2015, Table 4 demonstrates that Hope's school grade has consistently been a D or F since 2012, until the 2018 school year. In 2018, Hope had its highest percentage of students achieving a passing score in every subject area since the change of the test in 2015. This growth contributed to the Hope's attainment of a C as the school grade in 2018.

Subject Area	2012	2013	2014	2015	2016	2017	2018
ELA	39	34	39	33	27	34	36
Math	31	40	37	34	33	28	46
Science	25	32	27	35	25	31	45
School Grade	D	D	F	D	D	D	C

Table 4: Percentage of Hope Students Achieving a Passing Score on Standardized Assessment

Tables 5 and 6 provide the percent change between 2015 and 2018 for Hope (Table 5) and for the district as a whole (Table 6). As these tables demonstrate, Hope's scores improved in every area between 2015 and 2018, and the growth was greater than the district's growth in every area as well. For example, while the district's average percentage of students passing remained the same in math both in 2015 and 2018 (55%), Hope's percentage increased from 34% to 46%, an increase of 12 percentage points. Similarly, Hope's percentage of students passing the science test increased ten percentage points from 35% in 2015 to 45% in 2018, while the district saw an

improvement of six percentage points. Although the percentage of students achieving a passing score in each area is not yet equal to that of the district's average, the accelerated growth as evidenced by greater increases than the district in all subjects offers a promising outlook for the future.

Subject Area	2015	2018	2015 to 2018 Difference
ELA	33	36	+3
Math	34	46	+12
Science	35	45	+10

Table 5: Difference in Percentage of Hope Students Achieving a Passing Score
on Standardized Assessment

Subject Area	2015	2018	2015 to 2018 Difference
ELA	51	53	+2
Math	55	55	+0
Science	46	52	+6

Table 6: Difference in Percentage of All District Students Achieving a Passing Score
on Standardized Assessment

Discussion and Implications

The purpose of this collaborative inquiry was to explore the relationship between teacher leadership and student learning by understanding the interactions between and the influence of teacher leaders on students in an urban turnaround elementary PDS. Thus, we used the overarching research question, how are teacher leaders influencing K-5 students at Hope? to guide our longitudinal collaborative inquiry. The results indicated that students had several opportunities for student leadership and that teacher leaders worked in specific ways to foster student leadership. The results also showed that since the inception of a teacher leader academy in 2013, student perceptions of the school culture and climate, of their teachers, and of their school experiences showed overall improvements. Student achievement, as measured on state standardized test scores, also showed improvement. Thus, it is reasonable to suggest that teacher leaders shaped and were shaped by the school culture and climate as well as by students and student leadership.

Interestingly, this collaborative inquiry was conducted in an urban turnaround elementary PDS. Despite showing progress in student achievement, the school was facing takeover by an external company or closure in 2018. During the 2017-2018, the school faced increased scrutiny with the state inspectors and evaluators visiting the school weekly. As if that weekly pressure wasn't enough, that April, as the school was administering the state standardized tests, the external takeover company began their visits to the school to prepare for takeover. It was as if Hope was being set up to fail. In such high-stakes accountability, teacher leadership is often squelched due to increased state and federal mandates to decrease local autonomy (Endacott et al., 2015). But Hope debunked that self-fulfilling prophecy in many ways. The data from our collaborative inquiry

indicated that despite the accountability pressures, teachers were still engaging in teacher leadership. They continued to model leadership for students and engage in all of the specific activities, like those connected to the student government program, in spite of increased scrutiny. Overall, a majority of students remained favorable about their school experience and their teachers. Thus, it seems reasonable to infer that teacher leaders were helping to buffer the accountability pressures.

While it is certain that various efforts and factors impact a school's climate, our study demonstrates that Hope's emphasis on developing a strong cadre of teacher leaders occurred alongside increases in students' positive perceptions of their teachers and their school experiences, as well as increases their academic achievement. Building shared leadership capacity in a school through a structure like the teacher leader academy creates a space for teachers to explore and address challenges faced within their school context, including climate factors that are perceived as having a negative impact on teaching and learning. Because school climate has been found to overlap with student achievement (MacNeil, Prater, & Busch, 2009; Reyes et al., 2012), turnaround schools will likely benefit by exploring school climate issues; and teacher leadership is one structure that has various possibilities for impacting both school climate and student learning.

Our study also demonstrated that students' perceptions of their school experiences improved alongside increases in student leadership opportunities. Students at Hope feel they have many ways they can be involved at school, and they have a wide variety of opportunities to participate in leadership roles and activities. Because student connectedness has been found to be a predictor of academic success (Libbey 2004; Lizzio et al., 2011), student leadership opportunities might be an important consideration for turnaround schools because they offer various entry points for students to engage with their school community. Although schools are understandably often eager to focus directly on student achievement initiatives, we use complexity theory and the findings in this study as a basis to suggest that efforts to improve student learning ought to be considered from a variety of angles, including teacher leadership, student leadership, and school climate.

All PDSs must attend to the professional preparation of teachers (NAPDS, 2008). Often, this essential feature seems to receive much of the focus and attention in the PDS literature and at the NAPDS annual conference. Although attending to teacher learning has always been a part of PDSs (NAPDS, 2008), it seems to receive much less attention than teacher preparation in the research. Teacher education should be conceptualized as a continuum of teacher learning from teacher preparation throughout a teacher's career rather than as a separate dichotomy (Feiman-Nemser, 2001). Thus, this collaborative inquiry is a strong example of focusing more on in-service teacher learning than on teacher preparation because it sought to understand the influence of teacher leadership on students in a PDS. Since research has struggled to connect teacher leadership and student learning, bringing the lens of complexity thinking to PDS research opens the door for reframing the scope of PDS research. This collaborative inquiry is just the beginning; it shows the potential of what can be understood when researchers ask different, non-linear questions about influence in understanding the complexity of PDSs.

Limitations and Opportunities for Further Exploration

One limitation in our study is the change in data collection tools during the 2014-2015 school year. The Student SCIP survey was changed and expanded significantly in 2015; therefore, we were unable to use student survey data from 2013 (the year prior to the Teacher Leader Academy's beginning) as a baseline. Similarly, in 2015, the state department of education changed the standardized assessment used to measure student achievement in significant ways in order to align with newly adopted standards. Although data from 2013 and 2014 is included in our data tables, the student achievement data from these years is not necessarily comparable to the subsequent years.

A second limitation impacting our data is the high student transience rate at Hope. Because approximately 50% of the student body turns over each year, the student body providing our survey data and achievement data varied from year to year. Although we feel the growth in positive perceptions and student achievement is still a strong indicator of the influence of the Teacher Leader Academy at Hope, we acknowledge the limitation of high student transience as we seek to collect longitudinal data.

Finally, as is often true of analyses of student achievement data, it is difficult to draw conclusions about which factors led to impacts on students' performance. We used complexity theory as a framework in order to draw attention to the complex nature of the work taking place within our PDS, and we acknowledge the wide range of possible factors that may have influenced student achievement, student perceptions, and student leadership opportunities at Hope. For example, this study did not examine the role of school administration, including the pivotal role of the principal, in contributing to the positive changes that have occurred at Hope over the past five years. However, we assert that the Teacher Leader Academy has been a key component of our PDS and its growth and success over the years.

There is an ongoing need for research on connections between teacher leadership and student learning within PDS contexts. While our study demonstrates an overlap between teacher leadership initiatives and student learning, more research is needed to better understand how teacher leadership impacts and sustains student achievement. Additionally, this study draws attention to possibilities for exploring student leadership and student perceptions as important considerations related to student learning. Researchers might also gain important insight by taking our approach a step further by speaking with students themselves in order to more deeply understand their perceptions about factors influencing their learning and school experiences. Student academic achievement and growth might also be explored beyond only state standardized assessment data, perhaps including district, school, or classroom data as indicators of student learning. Finally, we urge researchers to continue expanding upon the exploration of teacher leadership within PDS contexts in order to contribute to our shared understanding of teachers as leaders and change-makers within our schools.

Conclusion

Over the last two decades, teacher leadership has received heightened attention both in research and in practice. Currently, teacher leadership is being explored in PDS contexts (Hunzicker, 2018). Despite this attention, there is limited research aimed at understanding the

connections between teacher leadership and student learning in PDSs and at large (Wenner & Campbell, 2017; York-Barr & Duke, 2004). Our study revealed that since the launch of a teacher leader academy at Hope Elementary in 2013, student academic achievement has improved, students' perceptions of the school climate and their teachers have improved, and student leadership is occurring in a variety of ways throughout the school. Our findings indicate that teacher leadership in PDSs has powerful potential for actualizing Goodlad's (1994), among others', vision of PDSs - the simultaneous renewal of schools and universities.

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Professional Development School (PDS) Building Liaisons: Going beyond Student Learning Outcomes

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Abstract: This action research study considered the role of professional development school (PDS) building liaison as a pivotal gear within the complex learning system of a PDS network. It is based on a series of discussions among a sample of veteran building liaisons as they reflect on the ways in which they have helped shape the learning of the pre-service teachers (PST) in their buildings and the ways in which this learning has been demonstrated in their K-5 students. The study helps to confirm the need for being memorable to students through building relationships and active role modeling. It also reinforces the benefits of sharing with other teachers in order to extend professional learning within a safe and trusting environment.

KEYWORDS: *active role modeling building liaison, building relationships, pre-service teachers, professional development school (PDS), teacher leaders*

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 reciprocal professional development for all participants guided by need
4. A shared commitment to innovative and reflective practice by all participants

The building liaison role is a pivotal role in our professional development school (PDS) partnership and, we suspect, in many other PDS programs. Working like smoothly functioning gears, the building liaison, representing the school site, interacts with the university faculty liaison who represent the university side of the relationship. They also interact with numerous individuals within their site. While a mechanistic analogy grates at our organic, relational sense of PDS work, the gear analogy helps us see the complexity of the relationship and the need for balance of workload, timing, and distribution of effort. The building liaison must be as knowledgeable and confident of operations in the school as the university faculty liaison is with those at the college.

Each must know from their individual perspectives how to source information, solve problems, and collaborate within and across the partnership. For this reason, the building liaison is essential to the success of the partnership, but even more importantly, to the overall objective of student learning at the pre-service and K-12 levels. As such, the building liaison is not only a teacher, but a teacher leader.

This action research study is based on a series of discussions among a sample of these veteran building liaisons as they reflect on the ways in which they have helped shape the learning of the pre-service teachers (PST) in their buildings and the ways in which this learning has been demonstrated in their K-5 students. The teacher leaders shared their ideas with the university professor corralling this overarching work and then reflected again on how their approaches did or did not mirror those of the other teacher leaders.

Background/Research Setting

The East Stroudsburg University (ESU) PDS partnership, 19 years young, includes 18 elementary schools in five districts located in northeastern Pennsylvania. Each school partnership consists of a principal, building liaison (classroom teacher), mentor teachers for PDS I and II methods level classes, cooperating teachers and university supervisors working with student teachers, and the university faculty liaison. While the building liaisons meet with the building principal, PDS mentor teachers, and university faculty liaisons informally as responsibilities demand, they meet regularly with the PSTs. They typically see the PSTs informally in the field each day as well as more formally bi-weekly or weekly (depending on the building site) for a total of 10 to12 hours per semester for clinical seminars called Liaison Meetings. When also functioning as a mentor teacher or cooperating teacher, the building liaisons have direct interaction and influence over their own PST for one to three semesters evolving from one to five days per week. In addition to teaching the PDS methods courses, university faculty serve as liaisons to the PDS sites. They spend part of a day once a week at their sites interacting with the first two levels of PST and mentors as well as checking in with the building liaison. The overarching governance includes the university dean, the director of field experience and partnerships, the faculty PDS coordinator, all university faculty working with PDS courses and student teachers, school principals and district superintendents. This group, called the Coordinating Council, meets once a year to review major issues and new efforts. A sub-group, the Liaison Forum, which consists of building liaisons, university PDS faculty, and administration, meets twice a year to brainstorm, discuss issues within the PDS, and make suggestions for new initiatives or ways to improve existing ones.

All Early Childhood Education (ECED) and dual Special Education/Early Childhood (SPED/ECED) teacher education majors (the PSTs) begin their elementary PDS experience as Primary I students the second semester of their junior year when they take methods courses in reading, special education, art, and social studies, and work at their PDS site one day a week. The PSTs progress to their first semester of senior year as PDS II students, continuing to take methods courses in science; math; language arts; special education; and advocacy, leadership, and collaboration, while learning to teach in their PDS site classrooms twice a week in a different classroom and grade level band from PDS I (either K-2 or 2-4). PSTs meet informally each week with both the university faculty liaison and the building liaison. During their final semester, each

ECED PST completes student teaching back at this same PDS site for one quarter each with their PDS I and II mentor teachers. SPED/ECED PSTs student teach for one quarter in with a PDS I or II mentor teacher and for one quarter in a special education placement. Concurrently, these students take their capstone course, Teacher as Researcher, investigating practice and conducting a Student Learning Outcomes (SLO) inquiry project.

Literature Review

When PDSs encourage teacher leadership, they are effectively engaging the intellectual capital of the school (Basile, 2009). No longer is leading the sole responsibility of one administrator but distributed across those who are closest to helping students learn. Teachers have the practical knowledge and experience of knowing their students, the curriculum being taught, and the strategies to teach it successfully. It makes sense for them to assume a leadership role to ensure that teaching and learning is optimized (Hargreaves & Fullan, 2012; Levenson, 2014; Wenner & Campbell, 2017). These teacher leaders have the capacity and influence to harness the power of other teachers, work collaboratively with them, and recognize and translate the teacher perspective when communicating with administration (Harrison & Killion, 2007). In doing so, they are able to build relationships, which in turn help them lead (Silva, Gimbert, & Nolan, 2000). This is recognized within PDSs in which teachers are often encouraged to take on multiple roles and often act as boundary crossers between the school and university (Holmes Group, 1990). In PDS, it is accepted that some teachers will take on roles such as Liaison to help the PDS function optimally. It is hoped that within a PDS, the teacher leader will have the support of both the school administration and the university PDS faculty. This helps create the professional conditions necessary to distribute leadership, particularly instructional leadership (Crowther, Kaagan, Ferguson & Hann, 2002). As teachers take on this role, they are able to help shape the professional communities needed to systemize learning.

In Pennsylvania, the capstone project for teacher education students is a SLO inquiry study (Pennsylvania Department of Education, 2009). At ESU, this is part of a course taught at the university but implemented at the PDS sites. The building liaisons exemplify the Domains IV and V (data evaluation and assessment) of the Teacher Leader Model Standards (Rutter & Barry, 2017; Teacher Leadership Exploratory Consortium, 2011) when they work with the students and cooperating teachers on this project. The building liaisons also exhibit the teacher leader competencies (Rutter & Leon, 2017; NEA, NBPTS, & CTL, 2018) through their leadership roles and responsibilities in creating a professional learning community that systematically works to improve student learning. The building liaison role of teacher leader often equates to professional developer, facilitator, and critical friend. The teacher leader informally assumes the leadership responsibility with mentors for ensuring these projects culminate in improved K-4 student learning. These teacher leaders become accepted by their professional learning communities as those who will not only develop their personal PST, but help all of the PSTs, and by extension, the mentors and themselves. Katzenmeyer and Moller (2016) referenced this in stating, "Teachers who are credible to their peers, who are continuous learners, and who pass relevant information about best practices to others influence their colleague teachers" (p. 126). This is a sound model of instructional leadership being distributed throughout a school and the professional, intellectual

capital of the school transforming teaching, learning, and leading. In doing so, it enhances teacher, as well as student, learning.

Research Methods

This qualitative action research study was conducted by a small sample of PDS building liaisons along with a faculty professor who doubles as a university supervisor and former PDS coordinator. The research consisted of a number of reflective discussions among the faculty member and the building liaisons. Due to difficulty getting everyone together at the same time, some discussions were one-on-one and others were small group online Zoom video discussions, based on their role as teacher leaders, interacting with mentors, PSTs, university faculty, and school administrators. Additional information was gathered during informal discussions in the building liaisons' classrooms. The building liaisons also referenced the notes and other artifacts they collected throughout the spring. This study was IRB approved.

Data Collection and Interpretation

The researchers asked themselves the following questions: If our job is to prepare the best future teachers possible – teachers who know their students, know how they learn, and to what extent they are learning, and in what context – how are we accomplishing that? In what ways do we as teacher leaders help the PSTs in our schools learn to teach with the end goal of developing students as engaged and productive learners? To answer these questions, a number of discussions were held to first determine what the questions really meant: What do we mean by teacher leaders, what do we mean by teaching versus learning, and what is the difference in learning as a PST and as an elementary student?

We analyzed the teacher leader frameworks (NEA, NBPTS, & CTL, 2018) and the pathways to becoming a teacher leader individually and collectively to identify particular ways they applied to our work and to gain a better understanding of possible ways of being a teacher leader. Mostly, we found that our building liaisons did not fit neatly into any of the specific pathways but had strengths in a number of them. In looking at how our PSTs make sense of becoming a teacher, we examined the major assignments of the Teacher as Researcher capstone course that were tied to course student learning outcomes, as well as to PSTs' university and PDS field assignments. In the capstone course, situated during the student teaching semester, the PSTs plan and implement a Student Learning Outcome (SLO) inquiry project; develop a student information analysis called Kid Notes related to the students they are responsible for in their elementary classes; conduct a Teacher Leader study; and develop formative assessment plans related to their teaching. The mentor teachers, and by extrapolation, the building liaisons, are asked to assist with and help guide these projects as well as those in the preceding methods courses designed as the foundation for these capstone assignments. For instance, in the preceding courses, in addition to lesson plans, the PSTs each complete the following: an informational case study on one student, a reading case study, a behavioral SLO, and a group advocacy project based on their PDS site's needs. These assignments are referenced in the interviews.

The researchers analyzed the transcripts of the building liaison discussions based on these questions. We specifically looked for patterns in which the building liaisons reflected on their

interactions with the PST and mentor teachers working with the PSTs. The faculty researcher coded the transcripts for further rounds of analysis and discussion, highlighting patterns as findings.

Research Findings and Discussion

The PSTs' SLOs provide evidence each term of their ability to accomplish short term student achievement during their student teaching. These SLOs are typically two week-long interventions with a small group of students based on a specific learning goal in literacy or math. For instance, the SLO could be on increasing phonemic awareness by two letters or increasing addition fact recall by 10%. Rarely, no more than 5%, does a PST not meet their given goal with their students. These projects are supported indirectly by the building liaisons and directly by the mentors. Given this data, as well as success with individual lessons, the building liaisons felt comfortable agreeing that the PSTs do help increase student learning and that the building liaisons, especially as mentors, deserve some of the credit in bringing this about. However, the building liaisons' reflections also revealed two findings of note from their discussions about being teacher leaders, helping pre-service teachers become better teachers, and enhancing student learning for the long haul. Across the board, they emphasized the importance of their role in 1) developing relationships by which strong bonds of knowing and trust are created and 2) being active role models to ensure that the learning takes hold.

Multiple Layers of Gears Functioning in a Complex Machine

To understand this better, we came to think of it as the inner workings of a machine, developing a myriad of relationships that resembled the multiple layers of gears functioning in a complex machine (see Image 1). The relationships (gears) each connected directly to their own central gear or to another gear which has its own offshoots, some revolving in tiers above and below, making the machine of the PDS function optimally. Try to visualize the links necessary for them to build relationships with all of the following: On one level, the university PDS faculty and administration; then other building liaisons; on another level within their buildings, administration; the teachers not directly mentoring PDS; and those that were mentors; PSTs on three levels – PDS I, PDS II, and student teachers who were in their buildings; and then more intensely with those in their own classrooms rooms; and possibly on a third level, their own classroom students. Peripherally, they also maintained relationships with other community stakeholders such as the PTO. All of these moving in sync, with some coming into play like a second hand on a clock with others in contact more like the passing of a day.

Image 1: Multiple Layers of Gears Functioning in a Complex Machine

Building Relationships

The building liaisons described their various ways of scaffolding learning through active role modeling for the PSTs and to some extent, their fellow mentors. In preparation for active role modeling, two important, but less frequent relationships (hence bigger gears) sync between the building liaisons and their university counterparts and between the building liaisons and their own administration. In terms of the university, the building liaisons indicated that they need to sustain strong connections with their faculty liaisons, serving as a resource for the mentors, arranging liaison meetings, and managing advocacy projects. While they mostly meet weekly during faculty visits, they might also reach out by phone or email for direct questions or consultation. Knowing you have a faculty liaison that can provide information and possibly help with issues or challenges can save the day. For instance, Beth recalled a school community project that was driven by the PSTs but needed more hands-on support. When the building liaison called for help, the university liaison not only came and helped out herself but brought another faculty member and her teen-aged daughter to help with activities. This was seen as an example of modeling for the PSTs the strength of a professional community that supports one another for the benefit of students.

Likewise, building liaisons also emphasized the need to have strong relationships with their building administration to ensure the trust and respect for autonomy in managing the PDS which in turn, allows the PST to have the opportunity to enhance student learning. For example, Emma, who teaches in a relatively small school, has been asked by her principal to assume a number of key leadership roles, often providing the teacher perspective. "I think I support my principal by giving her as much feedback as I can," Emma explains, "My principal counts on me to lead the PDS. She knows I can handle it. She trusts me with leading the PDS program in our building." Meg is also an important member of her principal's leadership team who provides a teacher perspective. Tapped by her principal to be the building liaison, Meg recalls, "She sees things in me that I don't necessarily see in myself, so I'm grateful to her for that, but I do feel [in a positive way] she uses me to help her in those different areas." These relationships and the respect they engender help support the work of the PDS.

Similarly, the building liaisons reiterate the importance of having strong connections with their fellow mentors and other building teachers to be sure the PSTs are getting every opportunity to learn, to ensure the support of the other teachers, and to provide an open door for questions and suggestions. It is a means of getting the mentors to also think of themselves as teacher leaders. While not every teacher serves as a mentor for a variety of reasons, some teachers will assist with PDS work by holding liaison meetings in an area of their comfort or expertise. Beth suggested encouraging participation by "just inviting them to be part of the process, inviting them to think about their strengths and help out with liaison meeting and things like that." Otherwise, the interactions vary in frequency and degree of formality. The building liaisons mention "checking-in" with their mentors regularly, but also frequently talking with them informally. Kailani indicated that she is "in contact with her mentor teachers all of the time. Whether it's a day the PSTs are there or not, I'm always touching base with the mentors." Emma cited that "many one-on-one conversations with the mentors in my building because it's so personal to help them be the best leaders they can be." Emma does walk-ins to touch base with the mentor teachers and stay connected because "it can be a bit overwhelming for mentor teachers at times, so it is important to be there and show appreciation for them."

Sometimes these interactions entail the building liaisons bringing back information from the university. Emma continued, "If I go to Coordinating Council and we talk about co-teaching, I'll go back and share the materials and talk to [the mentors] about how they can use that co-teaching model [with the PSTs]." Sometimes there is also vicarious professional development when the building liaisons hold workshops on something like technology for the PSTs. When the PST uses the technology in the mentor's classroom, the mentor can learn along with the PST and it is a win-win for students. Similar to what Meg said in relation to her principal's trust in her, Meg recognized that she too puts faith in her fellow mentors: "Our support allows them to recognize skills they don't even realize they have." She elaborated on the importance of the mentors accepting what is best for their own style of teaching: "It's not always going to be how I would do things…they need encouragement, just like our students." Emma observed that knowing her fellow teachers allows for the best matches to be made with the PSTs. To accomplish this, Kailani suggested asking the mentors, "Are things good?" explaining, "If we know things are good, we know communication is happening." When good matches and good communication translate into good teaching and learning, the gears click.

One of the first things the building liaisons address with the PSTs is developing relationships with them, knowing them the way they would know their classroom students. They then emphasize the importance of the PST, knowing the classroom students as well. Emma explained that having strong relationships with your elementary students:

> …allows you to know them not only on the academic level, but also a personal level and enables the teacher to identify what needs each child is bringing to the classroom with them, and how that affects their learning in the classroom…because when you're in elementary, those social and emotional needs sometimes come before the academics.

Part of being a teacher leader is modeling for the PSTs how to connect with their students– helping them as Emma stated, " to open their eyes, ears, and senses to what is going on around them with these tiny people instead of solely focusing on 'I have to teach a lesson in reading today." Beth reiterated the importance of building these relationships stating:

> If the kids aren't feeling it, if they don't feel comfortable with you, if they don't feel connected to you, [what you're teaching] is not going to necessarily have an impact on them…It's not likely going to stay with them long term.

Beth continued, "If they don't believe that you believe in them, it's really hard to teach them how to multiply fractions or find the main idea and supporting details."

Active Role Modeling

The building liaisons typically meet with the PSTs every day they are at the PDS site, sometimes casually and sometimes in formal liaison meetings. They mentioned holding sessions that touched on this idea of getting to know children, modeling how to conduct interest inventories, and doing things like checking in with their students at the beginning of each day. The gears click in nicely. The PSTs see the real-world value of the Teacher as Researcher Kids Notes assignment in which they have to collect information on their students and tie it into their teaching. It also demonstrates for the PSTs that what is being done at the PDS site is valued back at the university.

While learning to know your students is a first-line lesson, the building liaisons also work with the PSTs on all things related to teaching, many attached to assignments from the university

related to behavior management, writing lesson plans, implementing the plans, understanding curriculum, assessing learning, and differentiating learning. Such assignments are traditionally thought of as having a direct impact on student learning. To do this, building liaisons engage in active role modeling. The difference between being a role model and an active role model is typically the inquiry and scaffolding process as well as the mediating of their thinking to the PSTs in everything they do. Jo provided very detailed feedback in an ongoing inquiry/response notebook with her PST, asking questions about what she noticed about Jo's lessons as well as her own. These often became discussion starters or means to source answers.

Often, this involved helping them interpret curriculum and assessments. Beth explained how the teachers have had to work at the challenges of a new reading curriculum, which includes continuous assessment: "The program is very directed with dynamic small groups based on the assessments. The PSTs are planning it regularly with their classroom teacher." They are seeing the entire cycle of teaching and assessing." PSTs in these classrooms you cannot escape having this process modeled, scaffolded and explained as they work alongside their mentor teachers. Beth personally "would always have them stand behind [her], watch [her progress monitor], and ask, 'Did you hear [the student] misread that word?'" Beth further expounded, "I take them through the whole thing because it's all there. I can access all of their data from the entire year…we can map it, we can see it…there's a trend." She further stated, "there's no way a student teacher is not experiencing that level of separation and implementation, especially literacy differentiation."

Kailani and Emma described their mediating process as being "teacher whisperers." They work to get past the "apprenticeship of observation" by thinking out loud and whispering into the PSTs' ears about things that are being done in the classroom as they are happening. Emma talked about getting PSTs involved in what she was doing: watching, discussing it, and then doing for themselves. Kailani mentioned that she spends nearly half her time mediating in the beginning: "Every time I give an instruction, a reward, or a reminder, I turn and whisper to the PST." Kailani also discussed the scaffolding she does with her PSTs using Class DoJo, by first giving rewards and consequences and having the PSTs post comments. As the PSTs feel more comfortable, she has them come up with ways to show learning happening "to promote something we're doing, to promote a child or promote a tool, such as a student's writing piece or art piece." Similarly, Kailani scaffolds her morning student check-ins with the PST sitting with her as she meets with each student. Eventually, the PST takes over and shares back with her. Kailani and Emma also discussed the benefits of the PSTs learning to co-teach and take on small groups of learning. Do these things help student learning? Emma emphasized this in her statement:

> The differentiation part, the co-teaching - I teach, you assist - we swap roles. It's immeasurable the amounts of help it provides…Do I know that the PST sitting with those three students in the small group while I'm doing whole group helped those students? Of course it did, because if it were just me…there's no way I could have given that intensive support!

Emma reinforced this by stating, "On the days that the PST is there, the students who really struggle have more success…just by having a knowledgeable person there who's helping." Kailani also described the inquiry process after she has modeled a certain aspect of teaching:

> At the end of the day, I ask, 'What things did I have today that enhance the lesson? What are the materials I needed? What different resources did I use?' Then I brainstorm with them about their own next lessons.

Beyond active role modeling alone, Beth explained that she and her team members do this with one another, often with the PSTs present. They have think-aloud conversations where they "process things, talking out loud with each other" so that they all share and learn together. The PSTs benefit from "hearing how we talk to each other as professionals, use our resources in the building, use each other as resources, and reach out for help when we need it." This was often the process used to scaffold the SLO project with the PSTs.

When the PSTs conduct their SLOs for the Teacher as Researcher course, the building liaisons often become involved. They, in addition to the mentors, help them think about the very specific objectives they will need to set as well as the best practice they will be using. Emma came to the university to describe the overall process she goes through for her own SLO and shared ideas for their mini SLOs with the entire class. Jo met with her grade level teachers and PSTs to discuss their SLO plans. They met and actively modeled the process for selecting the students, the topic, objectives, and possible lessons. Jo's PSTs benefitted from an entire team working and mediating the process with them and each other. As mentors of their own PSTs the building liaisons also helped them identify topics and times throughout the day when they could hold their small group learning experiences. For example, Kailani discussed modeling how she assesses and sets goals in math and language arts. These were then used as potential topics for her PSTs' SLOs.

Just as these building liaisons scaffold and actively mentor their PSTs, the next step is to have them do the same thing for the new PSTs coming up. By doing so they can see how their own modeling is being applied. Emma dubbed this "Circle of Life Teaching." The gears go around and around.

Implications for Practice/Next Steps

These reflective discussions highlighted ideas we had some inkling of but had not formally expressed or confirmed. The findings of this action research study made us realize a few things we would like to emphasize. One is the importance of knowing your students, your teachers, and one another; and being willing to actively model teaching knowledge and skills for PSTs and one another. In addition, this action research helped us recognize how much talking about these topics helped us realize the power of learning together through directed discussions. Emma, in particular, mentioned how much she enjoyed sharing with the other liaisons at the semi-annual liaison meetings and how much that helped her grow as a teacher leader. But those only occur twice a year during school hours. While a number of the liaisons have presented action research topics at these meetings, these were more formal than open discussions.

Our recommendation is to find ways that allow for these discussions, these connections, without excessive time demands on already busy schedules. Carving out time to share ideas and experiences about teaching and learning can be enriching to all. These discussions were mostly conducted via the online conferencing tool, Zoom, which enabled a number of people to talk at once and to see one another while doing so. The conversations typically lasted under an hour in length, with some people coming and going during that time. It seems reasonable for these types of opportunities to be scheduled more regularly and opened up to a wider group without strings attached. Building a professional learning community run by teachers for teachers could also benefit the PDS. More informed and connected teachers and faculty that have learned to trust one

another through interactions such as these will help develop PSTs who enhance student learning for the long run.

Limitations

While the knowledge gained from these building liaisons illuminates the role played as teacher leaders, it is very specific to our PDS and our particular approach to PDS. The actions of these teacher leaders are not necessarily generalizable to those of others in liaison roles with PDS partnerships. In addition, these teachers work within the confines of their particular districts with very specific curricula within their schools and very specific curricular demands from the ESU methods courses. The relationships they have with their building administration, fellow mentor teachers, PDS partners and even the pre-service students add a layer of ever-changing complexity that further entangles any notions of generalizability. Furthermore, we need to remember that these are stories, reflections of actions taken over time, and therefore colored by overlapping and interwoven experience.

Conclusion

Knowing one's students is a foundational concept for teaching and for learning to teach. Getting this concept to click into place like a gear involves actively modeling for PSTs and by extension, for mentors. University PDS faculty also need to model this skill in their own classrooms and in their relationships with their PDS partners. While learning to create strong learning objectives and lesson plans is essential, knowing one's students and how and why they learn comes first. Knowing and connecting with students makes learning memorable. Being memorable to students – from K-5 to PSTs –means you are having an impact on them and their learning. This action research study helps to confirm the need for being memorable to students through building relationships and active role modeling. It also reinforces the benefits of sharing with other teachers in order to extend professional learning within a safe and trusting environment. As Emma summed it up:

> I don't think the program would run as well if there wasn't a liaison in the building…I think there is a comfort zone in having a teacher leader they can come to, whether they are PSTs or mentors…And I value the role…it really makes me reflect on my own practices [so that I can] be certain that I'm practicing what I preach.

As a result of this action research study, ESU's PDS building liaisons' contributions and impact as teacher leaders became explicit, and now their important work is documented.

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Fostering Beginning Teacher Growth through Action Research

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Abstract: In an effort to support beginning teachers in professional development schools (PDS) to cultivate helpful, substantive school-university collaborations and promote student learning, three faculty-in-residence collaborated with three in-service teachers at three different PDSs sites to conduct action research. This article describes the action research projects, which included implementing departmentalized teaching across a third grade team, increasing student motivation in a seventh grade band class, and reducing test anxiety in a tenth grade social studies class. Obstacles faced and recommendations for mediating the challenges of action research are also discussed.

KEYWORDS: *professional development school, action research, school-university collaboration, faculty-in-residence, beginning teachers*

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

Teachers are currently experiencing high levels of stress and increasing demands on their time. Adding to these stressors are expectations for teachers in professional development schools (PDS) to work with pre-service teachers who are learning how to enact the tasks of teaching that will be required of them upon program completion. To counter these pressures and support beginning teachers in PDSs while normalizing the enactment of unique and substantive school-university collaborations, university faculty assigned to the PDSs partnered with beginning teachers to conduct action research. This opportunity enabled teachers to develop teacher leadership skills by participating in professional growth and inquiry without being experts at the research process itself. Faculty and teacher partners collaborated to identify a challenge to student learning, cull research-based strategies to address it, document the implementation process, and analyze data to assess the efficacy of the enacted approach. In this context, beginning teachers

learned how to conduct action research as part of low-risk, collaborative partnership. Much like lesson planning, engaging in these processes helps teachers develop patterns of action and thought that then become more of a "habit" and less of a time-intensive practice (Wickstrom, et al., 2018).

Description of the PDS and School-University Partnership

The Winthrop University-School Partnership Network (WUSPN) began in 2009 as a shared vision among school, district, and university faculty. Today, the partnership represents nine school districts, three educator preparation colleges, fifty individual schools, and hundreds of teachers. Each participant in the Network - district, school, and teacher - has a mission that differs according to specific contextual factors, thus affording the partnership wide-ranging perspectives, needs, and inputs. While celebrating each partner's strengths and contributions, we maintain a common WUSPN purpose and shared vision of simultaneous renewal and support of P-16 (preschool through college) education, practicing educators, and educator preparation. To fulfill this mission, network partners collaborate to meet four specific goals: (1) Improve P-12 student learning; (2) Improve professional learning for district and university faculty and teacher candidates; (3) Strengthen pre-service teacher preparation; and (4) Increase support for new teachers and leaders.

The WUSPN has a unique structure offering simultaneous renewal for schools and individuals. Professional development schools (PDS) make up one part of the partnership. PDS sites engage in unique and intense school-university collaboration through action research and inquiry projects, and host teacher candidates for field experiences and year-long internships. Each PDS has a significant university presence with a Winthrop faculty-in-residence (WFIR) to support faculty, pre-service teacher candidates, and practicing teachers. With a dedicated faculty member collaborating from inception, PDS sites work to solve problems and find creative solutions that can be shared among WUSPN partners.

In spring of 2019, three beginning teachers in PDSs collaborated with university faculty in individual action research projects. Teachers were identified based upon their interest in gaining skills with action research for the purpose of improving student growth and development. The authors collaborated with Winthrop University teacher education graduates in their first four years of teaching, which allowed us to simultaneously consider teacher education program impact (e.g., curriculum changes) and facilitate teacher leadership.

The projects included an investigation of third grade departmentalization, increasing middle school student motivation in band class, and reducing test anxiety in high school students. This article describes each of the three action research projects. Obstacles faced and recommendations for mediating the challenges of action research are also discussed.

Literature Review

Beginning Teacher Support

Research suggests that problem-driven and people-driven support are the most effective types of mentoring programs for new teachers. Problem-driven support consists of "mentoring structures and activities linked to specific challenges that early-career educators encounter in the

classroom" whereas people-driven support includes mentors supporting "teachers' entry into professional communities" (SREB, 2018, p. 1). Ginnis, Heirdsfield, Atweh, & Watters (2001) identified several common activities that promote teachers' professional growth, including a focus on practical problems, reflection on teaching practices, and inquiry. The authors noted that working with beginning teachers to conduct participatory action research was a successful way to promote professional growth. Likewise, Hunzicker (2012) found that in-service teachers' exposure to research-based practices and participation in action research had a positive impact on their development as teacher leaders. Working with teachers on shared action research expands each educator's role, allowing for professional growth and development in teaching practices. In this way, the notion of university research transforms into a collaborative process that benefits all parties. The result is greater teacher efficacy and increased student achievement (Stevens, 1999; Martin, Snow, & Torrez, 2011).

Relationship Building

School-university partnerships continue to provide opportunities for positive outcomes for K-12 students, pre-service and in-service teachers, and university faculty. Although the potential for a successful partnership is transformative, the practical issues of interpersonal relationships and complex organizational structures make for a difficult path to success. The differences between a school setting and a university setting include work tempo, focus, reward, and power. These characteristics create challenges for school-university partnerships that often result in miscommunications, varied perceptions, and hidden barriers (Stevens, 1999).

To move past these difficulties, university teacher educators work to establish partnerships that support teacher development and, ultimately, student achievement. The university teacher educator plays a critical role in building a successful partnership by becoming a supportive member of the school who interacts and facilitates collaborative self-studies while recognizing the complex ecologies of a school setting. Embracing the ambiguity and tensions of this role assists partnerships in moving from cooperating relationships to collaborating ones (Martin et al., 2011). In establishing these effective relationships, considerations regarding how to collaborate authentically and in a partnership void of unequal power must be addressed. Authentic collaboration requires parties to acknowledge, consider, and overcome their stereotypes and misconceptions. Concurrently, university faculty-in-residence understand that relationship building is critical, and dedicate time, work to develop trust, and project a willingness to accept constructive criticism. In addition, the WFIR seeks to empower the teachers with whom they collaborate so they can share in ownership and control. This effective distribution of power encourages equitable partners (Easley, Henning, & Bradley, 2003).

Bronkhorst, et al. (2013) suggest one way to develop a collaborative partnership is to engage in "formative intervention" research in which university researchers' work with teachers to conduct research on real-world teaching problems. The intervention is deemed formative because it occurs during the normal day-to-day teaching practices and can be altered extemporaneously if necessary. The authors contend that the ability of the teacher to deviate from an original intervention design encourages the teacher to develop a sense of agency that will carry over into other areas of teaching. In addition, teachers' data analysis skills are enhanced because they become more adept at discerning which contextual variables affected the efficacy of their

intervention. Research indicates that such an integrated research approach leads teachers to feel that they are part of a collaborative effort rather than "being researched" from the outside (Bronkhorst, et al.).

Action Research Plan

WFIRs collaborated with recent Winthrop University (WU) graduates in established PDSs on action research projects. The projects were designed to devise and assess the efficacy of approaches used to improve K-12 student learning and to provide authentic, job-embedded professional development for educators. Three WFIRs identified three in-service teachers in three PDSs interested in conducting action research. The PDS sites included one elementary school, one middle school, and one high school. Additional information about each teacher and class is included in the results section. Teachers identified students' relative strengths and weaknesses in relation to specific teaching/learning challenges to determine the focus of the individual action research project. Projects included implementing departmentalized teaching across a third grade team, increasing student motivation in a seventh grade band class, and reducing test anxiety in a tenth grade social studies class.

Next, WFIRs worked with their teacher partners to cull relevant pedagogical research pertaining to the broadly defined action research questions being addressed. The WFIR and K-12 educators then discussed which pedagogical or procedural intervention(s) would be enacted. Next, they defined targets that indicated exactly what success would "look like" in a measurable way, as well as which observations, assessment measures, and/or artifacts would be used to assess students' growth. Finally, they created a preliminary protocol for analyzing and triangulating the data for use in continuous improvement. To ensure all research teams followed equivalent methodological protocols, an action research template was created in accordance with the protocols defined by Efron & Ravid (2013). Using these protocols, each action research project was completed collaboratively between WFIRs and their K-12 teacher partners.

Action Research Results

Pertinent facts regarding the settings in which these studies were conducted, the problem statements that informed the questions posed, the corresponding protocols enacted, and the results of these approaches and interventions are explicated below.

Elementary School: Third Grade Departmentalization

Setting. The elementary school is a neighborhood school comprised of approximately 650 students and 41 full time teachers in grades K-5, where more than half of students in the school (55.9%) receive free or reduced lunch. The research took place in a third grade classroom with 18 students; 9 boys and 9 girls. There were six Black, two White, and one Latino males, and three Black, three White, and three Latina females.

Problem Statement. In the previous school year, 45.9% of students met or exceeded grade level expectations on state standardized tests of achievement in math. Although this number exceeded both the state (42.6%) and district (44.6%) passing rates in math, Mr. Ford (pseudonym),

a first-year, third grade teacher, was concerned about his students' performance in math. He and the other two third grade teachers at his school presented a proposal to school administrators requesting that they be allowed to departmentalize their instruction, with each teaching a single content area to all three third grade classes. As part of the proposal, Mr. Ford would teach math.

Mr. Ford felt that the change to departmentalization would increase teacher morale and efficacy because each instructor could focus his/her lesson planning on individual areas of expertise. Additionally, Mr. Ford noted the use of common assessments, data tools, and analysis as a benefit of the departmentalized approach. Since each student in third grade would work with each teacher in third grade, the teachers would use a team approach to provide parents and caregivers with academic updates on their children.

Background. As high stakes testing measures and student performance outcomes continue to drive instruction, educators are compelled to consider methods for maximizing the time they spend preparing for and implementing quality instruction (Plank & Condliffe, 2013). Departmentalization has emerged as an increasingly viable means of providing quality instruction to a wider contingent of students in elementary schools (Gewertz, 2014). Departmentalization involves a team approach in which teachers specialize in one content area and focus solely on teaching that subject to a larger group of students within the grade level or school (Parker, Rakes, & Arndt, 2017). Research indicates that elementary teachers who participate in departmentalization report high levels of satisfaction related to lesson planning and instruction (Strohl et al., 2014). Critics of this approach cite the lack of attention given to the whole child and the (possible) attenuation of organically developing the positive student-teacher relationships that often occur in self-contained elementary classrooms (McGrath & Rust, 2002).

Implementation. In January of 2019, the third grade team was granted permission to begin the departmentalization approach. They developed a daily and a departmentalization schedule, which provided students with frequent breaks and access to varied instructional techniques (see Tables 1 and 2).

	Mrs. Jones' Homeroom	Mrs. Williams' Homeroom	Mr. Ford's Homeroom
7:30 – 7:45	Morning Routines	Morning Routines	Morning Routines
7:45 – 8:15	Schoolwide SOAR	Schoolwide SOAR	Schoolwide SOAR
8:15 – 9:10	Guided Reading/Prep/IDR	Guided Reading/Prep/IDR	Guided Reading/Prep/IDR
9:10 – 9:15	Transition Time	Transition Time	Transition Time
9:15 – 10:15	Content Session 1 (w/ AJ)	Content Session 1 (w/ TS)	Content Session 1 (w/ HS)
10:15 – 11:00	Special Areas	Special Areas	Special Areas
11:00 – 11:10	Transition Time	Transition Time	Transition Time
11:10 – 12:10	Content Session 2 (w/ TS)	Content Session 2 (w/HS)	Content Session 2 (w/ AJ)
12:10 – 12:15	Transition Time	Transition Time	Transition Time
12:15 – 12:45	Lunch	Lunch	Lunch
12:45 – 1:10	Recess and Restroom	Recess and Restroom	Recess and Restroom
1:10 – 2:10	Content Session 3 (w/ HS)	Content Session 3 (w/ AJ)	Content Session 3 (w/ TS)
2:10 – 2:20	Wrap Up and Dismissal	Wrap Up and Dismissal	Wrap Up and Dismissal

Table 1: Daily Schedule

Mrs. Jones' Content Session (students w/ Mrs. Jones)	Mrs. Williams' Content Session (students w/ Mrs. Williams)	Mr. Ford's Content Session (students w/ Mr. Ford)
Reading Mini Lesson (15 min.) Writer's Workshop (40 min.) Wrap Up / Sharing (5 min.)	Science/Social Studies (30 min.) Research/Content Writing (25 min.) Wrap Up/Sharing (5 min.)	Math Mini Lesson (20 min.) Stations/Guided Math (30 min.) Wrap Up/Math Talk (10 min.)

Table 2: Departmentalization Schedule

Each teacher spent the first two weeks establishing classroom rules and procedures with students from the other two classrooms. Admittedly, this process took time and patience, as the format was unfamiliar to the children. By the third week of the process, the children were comfortable with the new schedule and reported high levels of enjoyment as indicated by their responses to informal questioning.

At the beginning of the implementation period, Mr. Ford administered the Measure of Academic Progress (MAP), a computerized individually adapted test, to all students in his class (see Figure 1). In terms of overall performance, eight students (44%) scored in the lowest percentile on the assessment (<21%), four students (22%) scored in the Low Average percentile (21-40%), two students (11%) scored in the Average percentile and four students (22%) scored in the High Average percentile. None of the students score in the High percentile (>80%).
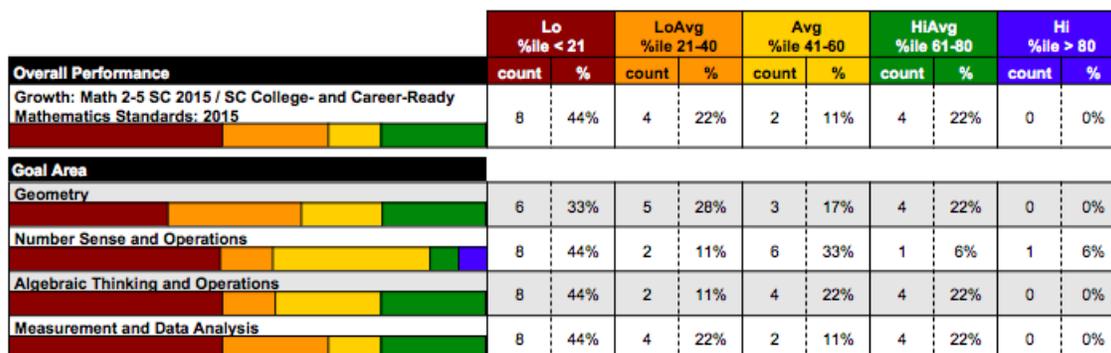

Figure 1: Winter MAP Scores

Analysis of student performance on specific math content indicated that a majority of the students (50%) performed in the Low or Low Average percentile on Geometry tasks; 55% of students performed in the Low or Low Average percentile on tasks related to Number Sense and Operations; and, 63% to 67% of the students performed in the Low or Low Average percentile on Algebraic Thinking and Measurement/Data Analysis, respectively.

Assessment. Following the intervention, there was little change noted in student performance relative to the MAP scores (see Figure 2). The number of students performing in the Low, Low Average, and Average percentiles remained the same. One student moved from the High Average percentile to the High percentile. The changes in relation to each of the math strands were minimal as well.

	Lo %ile < 21		LoAvg %ile 21-40		Avg %ile 41-60		HiAvg %ile 61-80		Hi %ile > 80	
Overall Performance	count	%	count	%	count	%	count	%	count	%
Growth: Math 2-5 SC 2015 / SC College- and Career-Ready Mathematics Standards: 2015	8	44%	4	22%	2	11%	3	17%	1	6%
Goal Area										
Geometry	8	44%	1	6%	2	11%	4	22%	3	17%
Number Sense and Operations	8	44%	2	11%	6	33%	1	6%	1	6%
Algebraic Thinking and Operations	5	28%	6	33%	5	28%	1	6%	1	6%
Measurement and Data Analysis	7	39%	5	28%	3	17%	1	6%	2	11%

Figure 2: Spring MAP Scores

Despite the lack of change in student performance on the MAP assessment, Mr. Ford was pleased with the outcomes related to student satisfaction, classroom community, student-teacher rapport, and teacher morale. Additionally, the teachers were successful in meeting their commitments to the departmentalization intervention. As a beginning teacher, it was rewarding for Mr. Ford to problematize academic concerns in the classroom and develop realistic data-driven solutions. Having the autonomy to make programmatic decisions reaffirmed the teachers' efficacy and administrators' confidence in his instructional decision-making.

Middle School: Student Motivation

Setting. The middle school action research project took place in a seventh and eighth grade school with almost 750 students. It is a Title I school, located in a rural community, where band classes are divided by grade level and instrumentation. The action research was conducted specifically with seventh grade students in their second year of band. The band director had taught for five years. The goal of the musical performance project was to increase student participation in music festival performance. In previous years, the teacher had a low turnout of students who were willing to perform at the music festival. By incorporating a motivational incentive, the teacher's goal was to increase the number of students performing at the festival.

Problem Statement. Research on student motivation for middle school students in a band classroom indicates that students who believe they are efficacious in music are more motivated to learn (Cogdill, 2104). Self-efficacy in music is defined as "beliefs about one's ability to accomplish musical goals" (Cogdill, 2014, p. 2). In addition, students' motivation to learn is associated with whether they have a growth or fixed mindset. Students with a growth mindset believe that with effort comes improved musical ability (Woolfolk, 2019). Consequently, students are more likely to put forth sustained effort. Intrinsic motivation to learn is also informed by self-determination theory, which indicates that students who feel competent, sufficiently autonomous, and a sense of relatedness are more apt to engage and persist in their learning (Deci & Ryan, 2000).

Given these motivational theories, the research question asked, what strategies will motivate students to engage in class and rehearsal and encourage students to take ownership of

their musical development? As essential skills for musical performers' success, motivation and ownership of the learning experience were the foci.

Implementation. The action research was conducted over a six-week period, during which time the music teacher enacted motivational strategies to provide his students with more choices, greater levels of autonomy, and a stronger sense of relatedness. For example, students were permitted to choose their own music to perform, their partners, and the setting of their performance. The teacher granted greater autonomy by allowing students to create their practice schedule with their chosen piece. Students' sense of relatedness was enhanced by allowing them to identify and work with musical partners who complemented their ability.

Students completed a pre- and post-survey to determine their levels of motivation and attitudes toward the class, the teacher, practicing time, performances, and their own confidence and ability. Students also completed a benchmark self-evaluation and a benchmark peer evaluation. The teacher used these data to monitor and adjust strategies throughout the unit. At the end of the unit, students completed a self-reflection. Observations and interviews were conducted by the WFIR.

Assessment/ Reflection. As noted above, the students were assessed in several ways to determine the degree to which their motivational levels increased, and if so, the impact on musical performance. Students' motivational levels were measured by a survey with a 5-point Likert scale, and included statements such as: I believe I can learn in this classroom, Learning is exciting in this class, and I am motivated to get better at playing my instrument. After participating in the intervention, average scores on each item became more positive, indicating increases in student motivation.

The benchmark self-evaluations and peer evaluations showed motivational gains as well. The self-evaluations included questions about difficult parts of the music selection, preparedness, and goals for improvement. The peer evaluation asked if the partner kept a steady tempo, appeared confident, and recovered quickly from mistakes. The final self-reflection allowed the students to consider their progress during the unit and reflect on improvements for the future. Notable comments included, "Teamwork made a difference," "I feel great. I gave it my all and put in effort," and "My favorite part was becoming closer to some of the people in our band and building new bonds."

Student observations and interviews were conducted during the third and fourth weeks of the unit. Students were focused and engaged during the observations. When interviewed, students said they appreciated the freedom to choose their musical piece and their partner. Several students mentioned that the task of creating their own practice schedule provided a sense of ownership. One student said, "This is my own responsibility to learn this piece."

When interviewing the teacher during the middle of the unit and at the end of the unit, the teacher repeatedly commented, "Sometimes it's about the process and not just the product." Giving students choice in the project encouraged high motivation and, therefore, high achievement. In referring to levels of motivation, the teacher said, "I can tell there is a difference. The motivation and excitement from this project has transferred into other activities and performances." He noted the unique success of teaching the unit with the inclusion of practices used to foster student motivation:

I have done this project a number of times, but by shifting my focus to the journey rather than the destination, I could see a difference in how students approached their learning. This is the first time I have ever had this many students excited to work on this project. Students could choose to perform at the musical festival or participate in a class performance. Of 57 students, 36 (63%) chose to perform at the music festival. The remaining 21 students (37%) performed in class.

The focus of this project was on developing young musicians; not just performing the musical piece. The unit was used to develop the habits and practices of good musicians through increased student motivation. By giving students autonomy and choice that related to their own learning, they were more motivated, which likely resulted in feeling greater musical efficacy. Developing students' intrinsic motivation, important concepts of discipline, and work ethic will likely prove beneficial in other areas, such as academic study and relevant life skills.

High School: Test Anxiety

Setting. The high school action research project took place in a suburban high school with approximately 1,400 students where the student population is 57% minority and 49% economically disadvantaged and the graduation rate is 84%. The action research took place in a tenth grade honors government/economics class with 34 students.

Problem Statement. Through observation, the teacher noticed that students appeared highly anxious regarding classroom tests. She also wanted to prepare students for the many high-stakes tests they would be required to take in high school. Research suggests that providing practice tests (Salend, 2011) and teaching test-taking skills (Supon, 2004) can reduce test anxiety in students.

Intervention. Over 12 weeks, the teacher taught students test-taking strategies; gave students frequent quizzes so they could practice test-taking strategies and become more comfortable with testing formats and introduced humorous/calming elements to the test-taking environment.

Assessment. Before and after the interventions, students completed a Test Anxiety Questionnaire (Nist & Diehl, 1990) consisting of ten statements. Students were asked to think about past testing experiences and rate their frequency of specific feelings and behaviors. Sample statements included, I feel sick to my stomach before a test, my mind goes blank during a test, and I am nervous before a test. Likert scale responses included 1=Never, 2=Rarely, 3=Half-time, 4=Often, and 5=Always. Possible scores ranged from 10 to 50. A low score (10-19 points) indicates that a student does not suffer from text anxiety. Extremely low scores (close to 10), indicate that a student may actually need more anxiety to be motivated to study. Scores between 20 and 35 indicate that a student exhibits some characteristics of test anxiety. This level of stress and tension is considered healthy. Scores over 35 suggest an unhealthy level of test anxiety. Complete pre and post data were collected from 26 of the 34 students. Student scores on the pre-test ranged from 10 to 49 with an average score of 29.7. Five students scored in the low range, 13 in the healthy range, and eight in the unhealthy range. Student scores on the post-assessment ranged from 10 to 50, with an average score of 24.25. Eleven students scored in the low range, 11 students scored in the healthy range, and 4 students scored in the unhealthy range. Table 3 displays the pre and post-test anxiety questionnaire results.

	Low Anxiety (10 to 19)	Healthy Anxiety (20-35)	Unhealthy Anxiety (>35)
Pre-test	5	13	8
Post-Test	11	11	4

Table 3: Test Anxiety Pre and Post Test Results

From the pre- to the post-assessment, student anxiety scores dropped slightly, by 4.82 points. More importantly, fewer students scored at the unhealthy level of stress on the post-assessment, dropping from eight students to four. Of the eight students who scored at the unhealthy anxiety level on the pre-test, three remained at the unhealthy level on the post-assessment, four moved to the healthy category, and one moved to the low stress level. These results suggest that teaching students test-taking strategies and introducing stress management techniques may help decrease student test anxiety levels.

Discussion

Enacting these action research projects was far more complex than the methodology and results, described above, suggest. In-service teachers' stressors, their responsivity to emergent concerns, and the feasibility of implementing new strategies and systematically assessing their efficacy make partnering in action research a complex interpersonal endeavor that often progresses in fits and starts. In addition, university faculty members – many of whom formerly taught these in-service teachers – are often viewed as authority figures by teachers, making perceived differences in power salient dynamics within the context of this process (Elliot, 1994). These complexities are described in further detail below. Also described are techniques that faculty-in-residence can use to mitigate these obstacles.

First, conducting action research can be appealing to many in-service teachers, and they will indicate this in initial conversations. However, there is an understandable difference between aspiring to do something and actually commencing a small-scale research project – particularly in a context of changing professional priorities. For example, one in-service teacher expressed concern regarding her students' difficulty decoding words, as it impeded their ability to comprehend test questions. The faculty-in-residence suggested using an open-source technology that read highlighted text to students aloud. Although this teacher found the suggestion helpful, she quickly pivoted towards a newly emergent concern: students' levels of test anxiety (Hakanen, Bakker, & Schaufeli, 2006). Thus, concerns that emerge for teachers on a regular basis, as well as how these concerns impact when they are able to implement specific interventions, make conducting collaborative action research a somewhat challenging task.

Second, identifying a problem to solve as an in-service teacher necessitates admitting that you neither have all the answers nor are able to control all changes among students. Discussing this openly can feel like risky business in the accountability-driven culture imposed upon schools, and, by proxy, teachers (Gill & Lerner, 2017; Dorman, 2003). In addition, as a mechanism for remaining in compliance and maintaining high standards, many administrators determine in-service teachers need to learn. This purportedly ensures that K-12 educators are learning the tasks of teaching that will foster their students' success (Shulman, 1986). Although that may be true,

this also creates a context of continuous improvement using a top-down approach. Action research, on the other hand, encourages inquiry from the bottom up, and necessitates honestly talking about the complexities of the classroom (Elliot, 1994). As such, these complexities do not remain safely cloaked in compliance metrics, such as K-12 students' performance on standardized tests (Gill & Lerner, 2017).

Third, many teachers are becoming increasingly tired and taxed (Vandenberghe & Huberman, 1999; Bakker & Schaufeli, 2000; Maslach, Schaufeli & Leiter, 2001). They are frequently required to engage in standardized test preparation, while teaching a vast spectrum of curricula in a relatively short time span. These requirements, as well as meeting the needs of students with increasing affective and social issues, make teaching a demanding career – precluding teachers from having the "bandwidth" to take on action research if it appears to be an added professional task (Browers & Tomic, 2000; Mitchell, Bradshaw, & Leaf, 2010; Evers, Tomic, & Brouwers, 2004; Isenbarger & Zembylas, 2006).

Fourth, many teachers graduate from teacher preparation programs with minimal data literacy, leaving a wide gap between their familiarity with, and understanding of, action research (Mandinach & Gummer, 2013; Mandinach, Gummer, & Muller, 2011). Thus, the benefits and requirements of action research remain somewhat unclear to in-service teachers, while the workload can seem overburdening. If the cost-benefit ratio of participating, particularly in partnership with a person with whom there is a power differential, is tipped in favor of costs, then it is no wonder that in-service teachers are hesitant to engage in conducting action research.

Implications for Practice/Next Steps

As noted previously, the faculty-in-residence who authored this paper learned how to mitigate some of these obstacles using a variety of techniques. One method, in addition to spending time building trusting relationships, was to make the action research methodology an organic, non-demanding exercise. For example, when one in-service teacher noted her interest in assessing methods used to attenuate students' test anxiety, the faculty-in-residence found an assessment measure that day and provided the teacher with copies immediately thereafter. Another method, used in the context of relationship-building and establishing trust, was to ask the in-service teacher to call the faculty-in-residence by her first name. This was emblematic of creating an equal partnership, not a relationship between an authority and his/her subordinate (Gascoigne & Wolfendale, 1995). Faculty-in-residence also mapped out the action research process for simplicity and reiterated the benefits of thinking about discrete challenges and ways to address them (Schwarzer & Hallum, 2008). In fact, they couched these practices as part of their "tasks of teaching" – not add-ons to an already very busy day. These practical and interpersonal methods, guided by inter-subjectivity (Prepin & Pelachaud, 2013), led many in-service teachers to endorse the benefits of working with these faculty-in-residence. These endorsements "spread" to other teachers interested in gaining support through learning, relationship building, and inquiry. Research indicates that teacher leadership is a developmental process and that teachers move into both formal and informal leadership roles over time (Hunzicker, 2017). By participating in action research with university faculty, these three teachers have begun their journey to teacher leader.

Limitations

It is hard to know whether the results from, and implications of, these action research projects are generalizable to other contexts and partnerships. The quality of university-school partnerships, the duration of time faculty-in-residence have been immersed in local schools, the challenges faced by the teachers therein, and the degree of "safety" and administrative support in-service educators receive are all likely to influence the degree to which these partnerships are robust, fruitful, and potentially normative facets of a K-12 environment. However, pervasive themes including ever-evolving issues in the classroom, feelings of trepidation regarding whether it is "safe" to discuss these challenges, power differentials, and the taxing nature of teaching appear characteristic of most educators with wide applicability throughout the United States (Chang, 2009).

Conclusion

The authors assert that the techniques described in this article, used to mitigate impediments to commencing action research, are likely to be not only helpful practices, but necessary pre-requisites to forming strong partnerships. They recommend implementing these strategies and assessing efficacy in dyads (teacher and faculty-in-residence), as well as within the broader school-based ecosystem, where reciprocally beneficial partnerships can have reverberating effects. These data can, and should, be collected and analyzed to inform "next steps" within this important work.

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Daring Greatly: School-University Partnerships and the Development of Teacher Leadership

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Abstract: This survey-based self-study explored how teachers' commitments to a formalized lead teacher role in relationship with a university partnership impacted their perceptions of themselves as educational leaders and as agents of change; and how these perceptions impacted P-12 student learning. The study showcases the importance of creating an infrastructure that includes a lead teacher component when establishing professional development school (PDS)-university partnerships and demonstrates the value and impact that teacher leaders bring to partnership work. Through this study, the authors hope to further professionalize and exonerate the role of lead teacher in order to encourage others to "dare greatly" by building on this effective model.

KEYWORDS: *professional development schools (PDS), teacher leadership, partnership infrastructure, simultaneous renewal, lead teachers*

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
7. A structure that allows all participants a forum for ongoing governance, reflection, and collaborate
8. Work by college/university faculty and P–12 faculty in formal roles across institutional settings

It is not the critic who counts; not the man who points out how the strong man stumbles, or where the doer of deeds could have done them better. The credit belongs to the man who is actually in the arena, whose face is marred by dust and sweat and blood; who strives valiantly; who errs, who comes short again and again, because there is no effort without error and shortcoming; but who does actually strive to do the deeds; who knows great enthusiasms, the great devotions; who spends himself in a worthy cause; who at the best knows in the end the triumph of high achievement, and who at the worst, if he fails, at least fails while daring greatly.

~ Theodore Roosevelt

Teacher leaders are in the arena that Teddy Roosevelt described when giving the *Citizenship in a Republic* speech at the Sorbonne in Paris, France in 1910. His message included that a democracy needs leaders of the highest caliber in order to hold the average citizen to a high standard. He called for leaders to engage in high integrity action and cautioned that words alone are not enough. Today's socio-political climate has created a need for teacher leaders to be in the arena as strong, moral, and engaged citizens more than ever before.

Many definitions can be found in the literature of what constitutes a lead teacher or teacher leader (York-Barr & Duke, 2004; Wenner & Campbell, 2017). Wenner and Campbell, in their comprehensive review of teacher leader research from 2004 to 2013, defined teacher leaders as "teachers who maintain K-12 classroom-based teaching responsibilities, while also taking on leadership responsibilities outside of the classroom" (p. 141). They go on to "acknowledge that this definition of teacher leadership does not represent a consensus conception but is one that helps differentiate teacher leaders from other forms of leadership in schools (e.g., administrators, disciplinary specialists)" (p. 141).

For decades, professional development schools (PDSs) have been discussed as a place for teacher leadership to be recognized and cultivated. Darling-Hammond, Bullmaster and Cobb (1995) described how leadership in schools "looks very different from traditional bureaucratic, hierarchical conceptions that slot individuals into different, limited functions and that place them in superordinate and subordinate relation to one another" (p. 93). Hunzicker's (2018) more current interpretation of teacher leadership in professional development schools, describes it as "a strategic, process-oriented stance motivated by deep concern for students and activated through formal, informal, and hybrid leadership roles that span the boundaries of school, university, and community" (p. 24). This definition illustrates the complexity of the multi-faceted roles a teacher leader plays as well as the dynamic nature of the conditions where those roles exist. Still, at the heart of a teacher leadership role is what Sergiovanni (1987) calls "cultural leadership;" the "power to accomplish" as opposed to "power over people or events."

In January of 2018, the Association of Colleges for Teacher Education (AACTE) published "A Pivot Towards Clinical Practice, Its Lexicon, and the Renewal of Teacher Education," which was the culmination of years of work from experts in the field engaged in clinical practice. The document outlines ten proclamations to further operationalize the recommendations of the 2010 NCATE Blue Ribbon Panel report. Many of the proclamations encompass the concept of teacher leadership, but the Expertise Proclamation describes its essence best:

> Teaching is a profession requiring specialized knowledge and preparation. Educators are the pedagogical and content experts. It is through the assertion and application of this expertise that they can inform the process and vision for renewing educator preparation. While external stakeholders play a role in the development of policies and regulations that affect educator preparation and licensure, educators themselves must take the lead to guide, shape, and define the parameters and renewal of their profession (American Association of Colleges for Teacher Education, 2018, p. 42).

Teacher leaders play essential roles in the renewal of schools, in preparing future teachers, and in supporting in-service teachers; and are often the next generation of school administrators. Studying how to identify, support, and retain this talent is imperative to the health of all schools, but especially those serving in PDSs with the charge of preparing new teachers for the profession.

This survey-based self-study explored how teachers' commitments to a formalized lead teacher role in relationship with a university partnership impacted their perceptions of themselves as educational leaders and as agents of change; and how these perceptions impacted P-12 student learning.

Description of the School-University Partnership

The University of Connecticut (UConn) Neag School of Education Professional Development School mission is predicated on the concept of simultaneous renewal and participation of all stakeholders. It is important to note the distinction between the *reform* of schools, a process where the emphasis is on fixing something perceived as broken, and *renewal*, a commitment to revisiting a system, partnership, or school many times and responding to the needs or changes of a dynamic, reciprocal relationship. Characterizing the difference between reform and renewal, Goodlad, Mantle-Bromley, and Goodlad (2004) explained, "Whereas school reform attempts to include in daily educational fare something that presumably was not there before, school renewal creates an environment – a whole culture – that routinely conducts diagnoses to determine what is going well and what is not" (pp. 156-157). At the center of UConn's partnership network is the commitment to simultaneous renewal.

UConn's PDS network as spanned 30 years and consists of 40 schools across nine school districts with clinical faculty who hold terminal degrees overseeing the settings. The long history of partnering has allowed time for reciprocal, trusting, professional relationships to develop among school and university-based educators (Fullan & Hargreaves, 1996).

The purposes of this study are to showcase the importance of creating an infrastructure that includes a lead teacher component when establishing PDS-university partnerships and to demonstrate the value and impact that teacher leaders bring to partnership work. Additionally, we hope to further professionalize and exonerate the role of lead teacher in order to encourage others to "dare greatly" by building on this effective model.

Formalizing the Lead Teacher Role in PDS

Teacher leadership capacity and potential has significant implications for school renewal, particularly in response to a national concern for educational improvement and accountability with regard to meeting the needs of all learners (Danielson, 2007; Mayrowetz, 2008; Muijs & Harris, 2007; Phelps, 2008; Scribner et al., 2007; Vernon-Dotson & Floyd, 2012). University and public school partnerships foster collaboration that attempts to break down traditional institutional walls so that research and practice can merge in a way that is life-giving for school and university-based educators, P-12 students, and preservice teachers enrolled in teacher preparation programs.

In 2010, University of Connecticut's Schools as Clinics Committee (SaCC) was initiated and co-chaired by the Director of School-University Partnerships and the Associate Director of Teacher Education. The committee's purpose is to provide PDS stakeholders with a forum for identifying and discussing pertinent partnership issues, recommending policy, processing candidate performance issues and dialoguing about the continued improvement of the teacher

education program. Also discussed were ways to promote simultaneous renewal, which is the ultimate goal of maintaining professional development schools.

In 2013, the Schools as Clinics Committee created a formalized Lead teacher role in an effort to professionalize and empower the role of school-based educators. This position ensures that communication between the university and the school is effective and ongoing. In addition to the goal of strengthening the communication loop, the role assists in improving the quality of clinic and student teaching experiences for teacher candidates. The coalescing of this group of professional educators has resulted in deeper, stronger, and more authentic relationships between the lead teachers and university-based teacher educators.

The lead teachers attend several meetings a year on campus with the intent of soliciting feedback from practitioners in university teacher preparation program revisions as well as promoting the sharing of current, best educational practices. This dynamic group has discussed topics such as effective qualities and dispositions of cooperating teachers, gaps and strengths of the teacher preparation program, and high leverage teaching practices. They have reviewed and provided feedback on the evaluations used to measure the quality and impact of field placements as well as on observational protocols generated to focus on teacher candidate strengths and areas for growth. Lead teachers helped create a tool to measure and assess university supervisor efficacy and have identified quality indicators of effective internship experiences for graduate students. The work and initiatives the lead teachers have engaged in have greatly improved the overall effectiveness of UConn's teacher preparation program.

Lead teachers hold a ten-month, annually appointed position in one of UConn's 40 partnership schools. They are nominated at the building level, using a process designed and/or endorsed by the district-level pre-service placement coordinator, and selected by their building administrator based on their values of simultaneous renewal and school partnerships. Lead teachers receive a stipend of $250.00 per semester for a total of $500.00 per academic year, which is commensurate with the compensation offered to cooperating teachers.

The roles and responsibilities of lead teacher include providing ongoing support to clinic teachers, cooperating teachers, and internship supervisors; participating in educational consortium meetings organized by the university to engage in educational discourse and to offer a practitioner's perspective and expertise with regard to teacher preparation; contributing to a receptacle of academic resources, such as videos, rubrics, observation protocols, and assessments, that support teacher candidates; and collaborating with university faculty in designing and executing research to add to the knowledge base of best educational practices, especially in the areas of the 19 Core Practices and how these practices can be leveraged to improve university-based teacher education at the university and beyond.

Examples of the type of work lead teachers engage in on a daily basis include offering supplemental information to clinic and cooperating teachers; observing pre-service teacher candidates; supporting problem-solving between cooperating teachers and the pre-service teacher candidates; and maintaining open lines of communication with all invested parties, including district-level personnel, school administration, university faculty, university supervisors and pre-service teacher candidates.

Methodology

Although UConn has greatly benefitted from the contributions of the lead teachers, it is also important to understand how a university and public school partnership impacts lead teachers' perceptions of their own leadership capacity and potential. This survey-based study served as a self-study of seven teachers currently serving as lead teachers in UConn partner schools. The study was guided by two questions: 1) What is the impact of establishing a Lead teacher component when building professional development school-university partnerships? and 2) How does this role impact teachers' perceptions of their leadership capacity and potential?

A survey of three open-ended questions was administered to all lead teachers (n = 11) in the partnership, and seven teachers responded. The survey questions prompted lead teachers to describe their perceptions of their leadership capacity and potential, share positive impacts of the PDS partnership on learning in their schools and classrooms; and suggest ways UConn might contribute to their development as teacher leaders.

The survey responses were analyzed for trends and new learnings. Content analysis was the process used to categorize and summarize the written responses. The researchers began with open coding, which included the initial organization of raw data in order to make sense of the written responses. The analysis continued with interconnecting and linking similar responses (axial coding), and concluded with selective coding, which allowed the researchers to formulate a cohesive explanation of the responses to survey questions by connecting three identified categories, which are discussed in the next section.

Discussion of Findings

Teachers' Perceptions of Leadership

Several teachers noted that teacher leadership was a necessity and important for educational improvement at all levels. The importance of teacher leadership is widely documented in the literature as a key factor in improving schools, raising student achievement, and retaining teachers (Cosenza, 2018; Dozier, 2007).

In this study, teachers felt the partnership supported collaborative work that allowed for "openly discussing, questioning and evaluating practices and pedagogy" and that their school community and teaching has improved as a result that "could not have been accomplished independently." This statement is supported by Warren and Peel (2005), as they assert that "teachers receive a greater sense of unity, greater sense of empowerment, a higher sense of responsibility for their school's destiny and an increased level of pride" as a result of successful partnerships between schools and universities (p. 351). One teacher noted that teacher leadership is "so important and undervalued" and appreciates that the university values her opinions as a practicing teacher.

Darling-Hammond (1997) stated that "in any successful professional development process, teachers will not simply receive knowledge but also generate new knowledge about students, learning, and teaching" (p. 10). Although the Lead teacher group does not provide a formalized professional development structure, it does provide both school and university-based educators

opportunities to learn with and from one another, and to generate new knowledge that has a direct impact on shaping the next generation of teacher educators as well as shaping the important work of teachers in their own school districts. For example, Wenner and Campbell (2017) reported, "As a result of participating on a leadership team in a school-university partnership school, teacher leaders in Vernon-Dotson and Floyd's (2012) study began to take on more formal district-level leadership roles" (p. 152).

One lead teacher's response to the survey confirmed that participation in the school-university leadership team has shaped her perceptions of the importance of teacher leadership at the district level:

> I think the greatest impact that this partnership has had on my perceptions of teacher leadership is the necessity for school districts to have a strong group of teacher leaders. This partnership validated and highlighted how teachers can make a positive difference in their district through work with others. It has been great to connect with other teachers around the state in order to hear about their experiences. I liked how we worked together toward a common goal but also spoke from our own perspectives.

Only one teacher stated that she did not think of the lead teacher role as leadership and perceived it as more of a liaison role. She was not sure if her views have changed based on the partnership. She added, "When I think of teacher leadership, I think of administration and learning to become an administrator." The idea that leadership is reserved for building principals is not uncommon. Conversely, another teacher explained how the school-university partnership has changed her perceptions of leadership by saying, "It has strengthened my idea that you do not have to be an administrator to be an educational leader."

Beachum and Dentith (2004) and Hunzicker (2012) found that, "By and large, teacher leaders were reported to feel more confident, empowered, and professionally satisfied via their work as a teacher leader" (Wenner & Campbell, 2017, p. 152). This assertion was implied in the following lead teacher quote: "Serving in the role of lead teacher affords staff the opportunity to impact the learning across classrooms. Through supporting and developing the next generation of teachers, lead teachers have a powerful role within the building."

Impact on P-12 Learning

Lead teachers were able to identify several ways the school-university partnership impacted student learning in their classrooms and school. Some of the findings were expected, such as how the partnership encourages teachers to reflect and that through making their practice transparent, their practice improves. Another expected finding related to the presence of a second teacher in the room and how that provides more access to instruction for students as well as different ways to explain concepts. The last anticipated finding was that the partnership affords the opportunity to share new practices and ideas across settings.

Interesting or unexpected findings shared by the lead teachers noted that public school students were motivated by the presence and participation of the university students to do their best work. Also, the teachers felt that not only did the partnership provide their students with more opportunities to connect with a caring adult for academic support, but also for emotional support.

Our understanding of the socio-emotional needs of students has become more complex, and lead teachers feel that partnering with the university can contribute to meeting more of those needs.

Lead teachers found value in knowing the experiences they were providing to university students may assist them in becoming more resilient in their in-service careers. Lead teachers acknowledged that the mistakes candidates are able to make under their tutelage would shape them into gritty educators later on. These altruistic reasons for engaging in mentoring or partnership work have been cited in the literature (Wenner & Campbell, 2017; York-Barr & Duke, 2004). Finally, engaging in partnership work makes teaching feel less isolating for lead teachers. Vernon-Dotson and Floyd (2012), much like Wenner and Campbell (2017), assert that "Teachers who go above and beyond their job description of teaching in their isolated classroom encapsulate teacher leadership" (p. 40).

Supporting Teacher Leadership

These teacher leaders offer insight into ways universities can contribute to their development as teacher leaders. This unique role affords them the opportunity to expand their teaching role beyond the constraints of their classroom walls. Additionally, it provides a lens into the instructional practices in various grade levels and content areas.

The role of lead teacher creates an opportunity for educators to network and refine their craft. In the words of one lead teacher:

> I think sometimes we get so bombarded with classroom responsibilities that we can't find the time to research other things. Providing an opportunity for us to engage in discussions with colleagues outside of our school setting is great for my professional development." In the isolating constraints of the classroom walls, educators can often crave the opportunity to network, discuss educational trends, and debate current issues. The lead teacher role is a unique collaboration with other teachers doing leadership work across school districts and content areas.

Lead teachers report that the university can contribute to their professional growth through a continued focus on highly effective teaching strategies. Exposure to these research-based strategies could then be turnkeyed to their own teaching staffs, maximizing the impact across districts. Participants have also discovered the benefits of sharing common experiences. As one lead teacher stated, "I would like to have time to discuss and share experiences with other cooperating teachers. This would support my role as a cooperating teacher, ensuring I am doing all I can to support student teachers and interns." Ultimately, teachers cited wanting more time to discuss the work they do on a day-to-day basis.

Finally, opportunities for continued teacher leadership exist through the role of lead teacher, a role that is not present in all school environments across the state. One lead teacher reported, "I would also, personally, hope to continue the work I have done with teaching dispositions and to continue to present at conferences and the partnership summit. All this work has truly strengthened my teaching and my capacity for leadership." Educators who are searching for opportunities to grow professionally and are not afforded opportunities in their own school buildings can continue

to build leadership potential. The following lead teacher response expresses the valuable contribution universities can have on the development of leadership:

> Being the liaison for my school and the university is one of the activities that impact my own leadership capacity and potential. I am able to support student teachers and interns in the important work of becoming certified educators, while being able to meet and form relationships with university personnel allows me to have a voice in, as well as knowledge of, the program that has been designed to support the creation of new educators.

Compensation for the time teachers put into partnership work seems to be an issue for most universities. It is widely cited in the literature that teachers are underpaid and are often asked to take on extra work for little or no additional compensation. While the lead teacher role provides a $500 stipend per year, one teacher noted that she would "love to see more compensation for the lead teachers and cooperating teachers, although [she knew] this can be a difficult task given budget priorities at the university."

A final interesting insight by a lead teacher noted that the best way to ensure strong future teacher leaders was to enroll the most qualified and excellent teacher candidates into teacher education programs. This teacher felt the likelihood that someone will become a teacher leader is something that is apparent while they are in their pre-service careers.

Implications for Practice and Next Steps

These findings provide insight in regard to furthering the capacity of UConn's lead teachers as well as how to develop leadership capacity in all teachers. The findings also may be valuable to those who want to start a conversation with academic deans, directors, or school administrators regarding the value and impact lead teachers bring to partnership work and how to create an infrastructure for the lead teacher role in PDS partnerships.

Greenlee (2007) pointed out that the top-down bureaucratic structure of schools is a challenge for the development of teacher leadership capacity. Through partnership work, the field has an opportunity to intentionally build leadership capacity in non-traditional ways. Teacher leadership development is not typically considered one of the goals of the PDS model; however, it is likely an unintended positive outcome. Rutter and Leon (2018) state that "layering the concept of teacher leadership onto a professional development school (PDS) model elicits many possibilities to enrich student learning, future teacher learning, teacher learning, and a generally richer profession" (p. 217).

Cosenza (2018) outlines several leadership roles that emerge in PDSs such as coaching/mentoring, collaboration and sharing best practices, guest speaking, and lecturing, prestige of being a PDS, steering committee membership, and the ability to engage in reflective practice. Many of these roles or benefits emerged from our data. Knowing these are the ways schools and teachers perceive the benefits of PDS partnerships allows us to thoughtfully consider ways to strengthen these opportunities or build them into a partnership experience.

Limitations

A limitation to this study is the small sample size. Because the sample was drawn from teachers associated with one university in one partnership model, the findings may not be generalized. In addition, the study did not report on what teachers who do not serve in the lead teacher role might be able to offer.

Conclusion

Barth (2001) found that "a powerful relationship exists between learning and leading. The most salient learning for most of us comes when we don't know how to do it, when we want to know how to do it, and when our responsibility for doing it will affect the lives of many others" (p. 445). Lead teachers are uniquely postured in that they are able to engage in this powerful relationship between learning and leading in order to have an impact on many lives. The school-university partnership acts as a conduit for simultaneous inquiry among all involved (Roselle et al., 2017), which ultimately benefits all stakeholders, including school and university-based teacher educators, P-12 students, and preservice teachers. The goal is that "both entities must collaborate and work together to create learning communities guided by shared beliefs about teaching and student learning, based on mutual trust and respect, and grounded in current evidence-based research and practitioner knowledge" (Vernon-Dotson & Floyd, 2012, p. 38). Our hope is that, through this collaboration, lead teachers will perceive themselves as powerful and impactful leaders, daring greatly, in their own educational communities and arenas.

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Analyzing Students' Self-Confidence and Participation in Class Discussions

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Abstract: This action research project was designed to determine whether teaching explicit discussion strategies to students receiving special education services would lead to an increase in self-confidence and participation during small group and whole class discussions in a general education classroom. Data were collected by two teacher researchers in a fifth grade English Language Arts (ELA) classroom using a pre/post student survey and classroom observation. Findings of the study suggest that explicitly teaching social skills focused on discussion allows special education students to self-identify situations where they struggle, rehearse new skills and receive feedback, and self-monitor their progress, sometimes with the desired end result of generalization to other settings.

KEYWORDS: *action research, special education, English language arts (ELA), class discussion, self-confidence, co-researchers*

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 partners

Imagine a fifth-grade classroom where a lively class discussion ensues over themes found in the novel *Hatchet* by Gary Paulsen. Around the room, many eager hands are up in the air, belonging to students anxious to share their thoughts and conclusions. However, there are a few students whose hands are not raised. Chances are, these may include the students who have Individualized Education Programs (IEPs). This is not uncommon; many students in special education may feel hesitant to participate in class discussions when surrounded by their general education peers. As Tanner (2013) states, simply calling on a student to answer a question in class can be "deeply uncomfortable to many students" (p. 325). Stefiel, Shiferaw, Schwartz, and Gottfried (2018) suggest that students with special needs may be unlikely to participate, leading them to feel singled out compared to their general education peers, and a lack of self-confidence may be partly to blame. Studies have shown that inclusion in the general education classroom provides multiple positive opportunities for students with disabilities, including exposure to grade level content and opportunities to engage in academic dialogue with grade level peers (Karlsudd, 2017; Sigstad, 2017). However, to fully benefit from learning in the general education classroom there are some hurdles to overcome for these students.

Karlsudd (2017) asserts that inclusion is necessary for providing students in special education with quality instruction and access to the same experiences that are offered to their typically performing peers. However, we (the first and second authors) noticed in our own fifth grade English/language arts (ELA) classrooms that there was a disconnect in classroom participation between general education students and special education students. We observed that when students receiving special education services were in small groups with general education peers of similar academic abilities, they demonstrated more self-confidence and willingness to participate, whereas during whole-class activities within the general education classroom, students with disabilities participated less often and appeared less confident. We also noticed, as Vasileiadis and Doikou-Avlidou (2018) observe, that many students with disabilities may feel "loneliness and rejection from their typically performing peers" (p. 268). This provided an opportunity for us, as teacher researchers, to examine this identified problem from a more systemic perspective. This action research project was designed to determine whether teaching explicit discussion strategies to students receiving special education services would lead to an increase in self-confidence and participation during small group and whole class discussions in a general education classroom.

Research Setting

This study was conducted throughout the 2018-2019 school year via a collaborative action research project between a general education fifth-grade teacher leader (first author) and a special education teacher leader providing services to students in a resource setting (second author). An assistant professor from Kansas State University's (KSU) Department of Curriculum and Instruction (third author) served as the facilitator of the districtwide action research group of which the teacher researchers participated. In addition to acting as facilitator, the assistant professor was on hand to provide feedback and assistance as needed for the duration of the action research project.

The study was conducted at Bluemont Elementary School, one of nine elementary schools in Manhattan-Ogden Public Schools, which supports approximately 320 students in grades K-6 (kindergarten through sixth grade). The district services approximately 6,500 students in Manhattan, Kansas. Bluemont Elementary School is a professional development school (PDS) that partners with KSU. As a PDS location, Bluemont hosts both undergraduate and graduate students from KSU's College of Education who are working through their pre-service practicum placements. The school is an accredited Title 1 school with 55% of the student population classified as economically disadvantaged. During the time of the study, the fifth grade class at Bluemont had 41 students, 20 of whom were male, and 21 of whom were female. The fifth grade was divided into two sections, or classes; one with 22 students and the other with 19 students. The students attended all core subjects in their homeroom classroom with the exception of ELA and math. These classes were departmentalized, meaning that one fifth grade teacher taught ELA to both classes while the other taught math to both classes. The study focused on three special education students.

Literature Review/Theoretical Framework

Class discussion is a vital part of any ELA classroom. While there are many instructional methods a teacher may use, such as lecturing and assigning projects for students, one of the most critical methods of instruction is grade level discussion (Witherspoon, Sykes, & Bell, 2016). Shaughnessy and Forzani (2012) explain that class discussion incorporates a combination of curricular content and student talk that is both high quality and high quantity (as cited in Witherspoon et al., 2016, p. 6). Additionally, a positive relationship must be established between the students and the teacher leading the discussion (Breeman et al., 2015). Teachers commonly play a role in connecting multiple students' input by asking one student to expand on another's ideas, or to restate an answer given by another student (Ghousseini, 2015). Although there have been several studies exploring the social relationships between teachers and students and the effect of teacher experience on discussions (Ghousseini, 2015; Nelson, 2018), there is little research examining how student self-confidence affects willingness to participate in class discussion in an ELA classroom.

While there are many benefits to engaging in class discussion, students don't always participate equally (Dallimore, Hertenstein, & Platt, 2004). Specifically, more research is needed to study the participation of students who receive special education services while learning in a general education ELA classroom. Due to the fact that special education students may already have negative perceptions about social interactions (Stiefel et al., 2018), they may interact differently in various classroom processes (Breeman et al., 2015). For example, negative perceptions may play a factor in students' willingness to participate. If a special education student has concerns about certain situations, such as sharing an answer or idea in front of their general education peers, a physiological arousal may lead to avoidant behaviors resulting in lack of participation (Nelson, 2018). Feeling included or experiencing a sense of fellowship with peers is a social benefit of inclusion (Sigstad, 2017), but this can be hindered if a student with special needs feels uncomfortable participating in discussions in the general classroom.

Useful and thoughtful class discussion does not come naturally for some students, so social skills may need to be taught (Dallimore et al., 2004). This is especially true for students with special needs, as they often need explicit instruction in social skills and discussion behaviors to gain self-confidence and proficiency (Swenson, 2003). Providing students with explicit instruction on strategies to call upon when faced with stressful social situations, such as a class discussion, can positively influence students' willingness to participate in those situations. It is often the role of the teacher to help build students' self-confidence (Tanner, 2013). There are not always strategies and organizational structures in place in an inclusive classroom, and this is where the teaching of explicit strategies comes into play (Sigstad, 2017). Sigstad (2017) found that the best inclusive lessons are ones where students have an option for social interaction. Learning strategies for participating in a class discussion gives special education students opportunities to interact with their general education peers on an equal footing. Instruction can be individualized or part of a social skills curriculum.

Skillstreaming, a research-based social skills curriculum, was developed by Dr. Arnold P. Goldstein and Dr. Ellen McGinnis in 1973, and is currently on its third edition (McGinnis, 2012). The curriculum is designed for use with students from early childhood through adolescence in both general education and special education settings. Within Skillstreaming, social skills are

clustered into five main domains, including classroom survival skills, friendship making skills, dealing with feelings, alternatives to aggression, and dealing with stress (McGinnis, 2012). Each social skill lesson follows a four-part framework. First, the targeted skill is briefly defined, then modeled by the teacher using situations that are relevant to students' lives. The modeling is done through a think-aloud, and the skill steps are clearly identified. Following the think-aloud model, students brainstorm situations where they feel the skill would be useful. The second part of the framework is role-playing. Each student takes turns role-playing the behavioral steps with a co-actor through a think-aloud in a situation of their choosing. The other students serve as observers, watching explicitly for each social skill step in action. Providing performance feedback, the third component of the framework, occurs next, first by the co-actor, then the observers, then the teacher, and finally the main actor. The process continues while each student takes the role of lead actor. The fourth step of the framework, generalization, occurs with the use of skills homework. Students are asked to try the social skill steps in real-life, then complete a homework report that addresses the social situation, implementation of the necessary steps, and a self-evaluation of performance.

Once students have received explicit instruction, guided practice, and opportunities for feedback, they are ready to begin the steps for self-regulation and generalization of their newfound skills through goal setting and self-monitoring. Research has found that the practice of student goal setting and self-monitoring leads to positive student outcomes, including higher self-confidence, increased participation, and decreased stress (Lee, Palmer, & Wehmeyer, 2009).

Research Methods

Stringer (2014) notes that an action research project allows teachers to feel ownership in the research activities in which they engage and is essential in facilitating active participation in their classroom. The action research process begins with a plan for the research process, then provides an opportunity for teacher researchers to gather data, analyze and reflect on the data, and identify an action plan for moving forward (Stringer, 2014). For this action research project, two teacher researchers set out to determine whether teaching explicit discussion strategies to students receiving special education services would lead to an increase in self-confidence and participation during small group and whole class discussions in a general education classroom. They collected data on three fifth grade students; two males and one female. All three students were on the caseload of the special education teacher. All three students received pull-out services in both ELA and math, which took place in the resource (i.e., special education) classroom, but spent approximately 85% of their day in the general education classroom since they all attended core ELA instruction in the general education classroom by the general education teacher.

Data were collected through quantitative self-assessment surveys and classroom observations, which serve as the basis for discussion in this article. Institutional Review Board (IRB) approval was granted by the school district, and parental permission was collected through an informed consent form for each student. To begin, students completed a survey to self-identify their self-confidence and participation in class activities and discussions. Students in the general education population were given the pre-survey as well for the purposes of comparing their answers to those of the target students. Following the pre-survey, over a period of three months, the three target students received explicit instruction by the two teacher researchers on two different social skills strategies focused on discussion.

Skillstreaming Curriculum

The first strategy implemented was Skillstreaming: Contributing to Discussions (McGinnis, 2012). Student participants received specific skill instruction in a small group in the resource classroom by the special education teacher. Instruction was implemented over 30-minute sessions one time per week for one month. Students received initial instruction, including definitions and teacher modeling, during the first week. During the next two weeks, students role-played and provided feedback to one another. At the conclusion of the second and third sessions, students were assigned skill homework, or application, which took the form of goal setting and self-monitoring.

Goal setting and Self-monitoring

After a one-month period of Skillstreaming, the second strategy was implemented, which included a combination of goal setting and self-monitoring. This strategy, based on a plan designed by Sprick and Howard (2012), is intended to help students using the Self-Determined Learning Model of Instruction (Wehmeyer, Palmer, Agran, Mithaug, & Martin, 2000). First, the exact behavior needing growth was identified and defined in a conference between the teacher and each student. Next, students were given the opportunity for guided practice. The teacher provided discussion topics in advance and privately prompted the student before asking them to participate. For each attempt, students were positively reinforced with specific feedback. Following this, students were given a self-monitoring card. They self-identified a goal for the number of times they would attempt to participate in a discussion. They tracked each participation attempt as well as how they felt while participating by selecting a frowning face, neutral face, or smiling face. Over the course of one month, progress toward each student's participation goals and their self-confidence related to participating in small group and whole class discussions were discussed, and new goals set as needed.

The teacher researchers observed the three target students during general classroom instruction, both before and after learning about the participation strategies. Observational notes were taken, and a rubric was used to determine the quality and quantity of student participation small group and whole class discussions. Finally, the three target students took a post-survey, which had the same questions as the pre-survey.

Results and Discussion

As Stringer (2014) notes, data analysis is an important part of the action research process. In this study, data analysis revealed several interesting findings.

Pre-Survey

The pre-survey, written by the teacher researchers, had three main goals. The first aimed to judge the comfort level the target students felt when participating in both a whole class discussion and discussion in a small group setting, with either the general education or special education teacher. On the Likert-style pre-survey, students rated their comfort level with whole

class discussion on a scale of feeling comfortable: never, sometimes, often, or always. Two of the target students shared that they often felt comfortable participating in a whole class discussion in the ELA general education classroom, while one reported only feeling comfortable sometimes. This is in comparison to two students who often felt comfortable in small group discussions and one student who always felt comfortable in small group discussions.

These findings were unsurprising to the teacher researchers, as normally students are placed into small groups with peers of similar academic ability. This preference was further evident throughout the rest of the pre-survey, when students were asked about their feelings while participating in class discussions, and the factors behind those feelings. In all cases, the target students were more comfortable and willing to participate in small group discussions rather than in whole class discussions.

Additionally, the teacher researchers asked students to identify feelings associated with joining in on a class discussion in both a whole class environment and in a small group environment. The target students expressed feeling "scared" and "shy" when included in a discussion with the entire class. Factors mentioned by all three of the target students that led to these feelings included the number of people in the class, consideration of who was around them, and concern over what other students thought of them. On the other hand, students described feelings in small group discussions as "good," "great, because I know them [students]," and "Okay. I don't really care." Only one student was worried about what other students would think, sharing that s/he sometimes had trouble thinking of an answer. As previously mentioned, this is further proof that students tend to feel more comfortable when surrounded by peers of a similar academic ability. Having closer contact and feeling comfortable with the teacher may also be a consideration; none of the students said that they were concerned over what their teacher thought of their answers as a factor in their comfort level.

Finally, the pre-survey intended to see what, if any, skills or strategies students self-identified for helping themselves to feel more comfortable participating in small group and class discussions. As expected, the special education students were unable to determine which strategies to use. One did not respond to this question, while the other two students responded, "no clue" and "I try to think." This lack of articulated strategies was made even more evident when compared to the answers from their general education peers who were able to identify strategies such as "just think about if my answer makes sense," "pretend I'm talking with my parents or brother," and "I count in my head and pretend no one is around." These responses show that, while an awareness of others does affect typically performing students, they are able to use a variety of strategies to overcome any uncomfortable feelings or anxiety. Because the typically performing students were already able to self-identify participation techniques, they did not show a need for additional instruction and were not a part of the remainder of the action research study.

Classroom Observation

The teacher researchers observed the target students in whole class and small group discussions three different times: before any strategies were taught and after the explicit teaching of the two strategies. Observations included how often students participated in a discussion and whether-or-not their responses were basic or advanced. The teacher researchers defined a basic response as nodding, a one-word answer, an incorrect answer, or simply saying "I agree with

[another student]." An advanced response was defined as expanding on a peer response, initiating conversation/discussion, or sharing a unique thought. Additionally, the teacher researchers kept track of whether-or-not the targeted students' answers were prompted or unprompted. An answer was considered prompted if the teacher called on a student without their hand raised, and unprompted if a student had their hand raised to participate.

No strategies used. The first observation of the three target students occurred prior to teaching any specific strategies. During whole class discussions, all students either had zero participation in discussion or responded with only a basic response. None of the students gave an advanced response, although 75% of the basic responses were unprompted, versus 25% that were prompted. In small group discussions, the students showed a higher participation rate. Even without employing any strategies, the students were considered non-participating only 18% of the time. The majority of student responses during small group discussions were unprompted. One of the three students was observed giving advanced responses.

Skillstreaming: Contributing to discussion. After students were taught the strategy of Skillstreaming: Contributing to Discussion (McGinnis, 2012), they proved to be more willing to participate in whole class discussions; however, most answers were still considered basic responses. Sixty-three percent of the responses given, while unprompted, were considered either no participation or a basic response. Student participants were occasionally provided with a Contributing to Discussion reminder page (McGinnis, 2012), which may have had an effect on whether-or-not they applied these strategies. Similarly, in small group discussions, the three students were likelier to participate. Only 5% of their answers fell into the category of no participation, and 52% of their answers were considered basic responses.

Goal setting and self-monitoring. Student responses to the goal setting and self-monitoring strategy (Sprick & Howard, 2012; Lee, Palmer, & Wehmeyer, 2009) were even more encouraging. After setting their goals, 100% of student responses during whole class discussion were unprompted, and 71% of those were considered advanced responses. This was a dramatic increase from previous observations. Only one instance was observed where a target student did not have an answer when called on. Notably, as opposed to previous observations, students did not respond as well during small group discussion when taught using the goal setting and self-monitoring strategy. This may be because the target students felt self-conscious having their goal sheet visible to the peers at their small group table. While 63% of answers were considered advanced responses, only 37% of answers were unprompted.

Post-Survey

While some areas of the post-survey showed little change from the pre-survey, there were some areas of distinct improvement shown by the three target students. Despite some of the data collected while observing small group discussion after the goal setting and self-monitoring strategy was taught (Sprick & Howard, 2012; Lee, Palmer, & Wehmeyer, 2009), the target students continued to express comfort in participating in small group discussion with their similar-ability general education peers. Students shared that during small group discussion, they were "really ok with it," and that they considered small group discussion "great and good and fun." As with the pre-survey, one student said s/he always felt comfortable in small group discussions, with the other two students sharing that they often felt comfortable. One interesting point is when asked what

factors contributed to these feelings, two of the students took into consideration what the teacher thought. No students had chosen this as a factor on the pre-survey. This change is likely because the students had become aware of the teacher doing observations during class discussions throughout the research timeframe.

The post-survey showed an increased comfort level for the target students when participating in whole class discussion. One student always felt comfortable, one student often felt comfortable, and one student sometimes felt comfortable participating in discussion with their typically performing peers. Additionally, in the post-survey, students described their feelings as "good" and said [they were] "fine with it, I like it." Factors contributing to these feelings were the number of people in the class, the students who were around, and being able to think of an answer. This third factor was not mentioned in the pre-survey, indicating that students had learned to spend more time considering an answer before sharing it with the class during a discussion. This finding was further evidenced by the fact that the target students were able to share strategies they used to support their involvement in class discussions. Prior to instruction of the two strategies, the three students were not able to articulate any strategies, but on the post-survey one student shared, "I think of the answer before or read it before the teacher speaks." Students also mentioned "paying attention in class" as a helpful strategy.

It is important to note that while observations were only done in an ELA classroom, there was evidence that students were beginning to transfer these strategies to other content areas as well. One student proudly and excitedly expressed to the teachers, "I raised my hand in math today!"

Future Implications

There are many opportunities to extend this action research project. The teacher researchers recommend continued research to include a larger sample size. This would provide more data to analyze and offer continued validation to support this research. Additionally, since observations were done only in a general education ELA classroom, further research is needed to determine whether students can transfer these strategies across different subject areas. While one of the students verbally demonstrated the transfer of skills, observations were not collected in different content areas.

The teacher researchers also recommend a longer observation period. It would be worth doing follow up observations after explicit instruction of the strategies has concluded. This could be done during the following school year to address whether-or-not the students internalized the strategies they were taught. In addition, this action research study only included observations of students' responses when they were called on. A further research study might seek to include the number of times students raise their hands to participate but are not called on.

Something that must also be considered is the nature of the students' personalities and their relationship with the teachers. During this action research study, the teacher researchers were the ones who taught the strategies and completed the observations. The students had prior relationships with the teacher researchers since this was their second year working with the special education teacher, and they had been with their general classroom teacher for over half of the school year at the time of the study. Due to this prior relationship, students may have been more comfortable than they would have been with an outside observer. One of the target students was very shy and

withdrawn, particularly with unknown adults. Another student was very outgoing and loved attention from all adults. It would be worth investigating whether-or-not student personalities and student-teacher relationships play a part in the effectiveness of this type of study, and how these factors affect students' comfort in participating in discussions.

This action research study only addressed two strategies for increasing students' self-confidence in participation during class discussions. There are other strategies to consider, and it would be worth including these in a future research study. By expanding the study in this way, a future researcher could study the effect of each strategy in isolation to determine the most effective strategies for students.

Limitations

There are some limitations to this action research study. The sample size was only three students. This makes it hard to know if these results would carry over to a larger group. Additionally, the teacher researchers were directly involved with the students prior to the study, which may have influenced students' responses. Another potential limitation was the level of understanding the target students had when taking the pre- and post-survey. The teacher read the survey questions aloud, but the students did not ask for any clarification on what the questions meant, which may have caused some questions to be skipped since students were not required to answer every question. Finally, it is worth noting that the post-survey was given after both strategies were taught. This makes it difficult to determine whether one strategy was more effective, or if the changes between the pre- and the post-survey were due to a combination of both strategies.

Conclusion

The findings of this study suggest that explicitly teaching social skills focused on discussion allows special education students to self-identify situations where they struggle, rehearse new skills and receive feedback, and self-monitor their progress, sometimes with the desired end result of generalization to other settings. In this study, target students were found to have increased self-confidence and participation in both small group and whole class discussion after receiving explicit instruction. By studying student participation in this way, the teacher researchers who conducted this action research were able to take on new leadership roles within their own classrooms to ensure active engagement of all students.

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Investigating Student Motivation to Read: Community, Environment, and Reluctant Readers

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Abstract: This action research project, conducted by a classroom teacher and a university professor, investigated fourth grade students' reading motivation. The research project was supported by a professional development school (PDS) partnership grant to support literacy education. The focus of the study was on students who were capable, scored well, and generally met expectations on assigned reading tasks yet remained unmotivated during independent reading. Findings of the study revealed that understanding a student's reasons for being a dormant, uncommitted, or unmotivated reader equips teachers with knowledge that can guide interventions. When teachers understand the structure of a student's reading community and environment, they can determine what supports are needed.

KEYWORDS: *reluctant readers, action research, professional development school (PDS)*

NAPDS NINE 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

Reading instruction encompasses a vast and ever-changing landscape of literacy development, strategies, and pedagogy. Much of this focus is on developing early reading literacy and supporting students who need remediation at each grade level. Often, students who are capable of reading, test well, and complete their tasks are considered successful, especially in the intermediate grade levels. These students may even receive enrichment to support and challenge their abilities. However, unbeknownst to their teachers, they may still lack needed reading support.

In this action research project, Todd Spreer, a fourth grade teacher and first author, and Dustin Meritt, a university professor of practice and second author, worked together to investigate students' reading motivation in order to help improve Spreer's classroom practice. The research project was supported through a professional development school (PDS) partnership between their university and school district, which had recently received a grant to support literacy education. As part of the districtwide action research group, Spreer and Meritt joined with other educators to investigate classroom practice under the guidance of a university professor. The focus of their study was on students who were capable, scored well, and generally met expectations on assigned reading tasks yet remained unmotivated during independent reading. For these students, it was clear that just because students can read does not mean that they will read. Therefore, their study was inspired by the following question: Why were these students, who were by most measures considered successful readers, not engaging in acts of personalized reading?

Research Setting and Background

Since 1989, the Kansas State University (KSU) College of Education has entered into mutually beneficial partnerships and projects with local school districts to positively impact teaching and learning. The project that served as the research setting for this study included all PK-12 (pre-kindergarten through high school) schools in Manhattan-Ogden Public Schools in Manhattan, Kansas. Within this PDS partnership, the district hosts teacher candidates in rigorous, carefully sequenced field experiences; and network partners collaborate to conduct and disseminate research that examines critical questions facing educators today. University personnel also provide professional development and support for educators and play a key partnership role in district initiatives. Through this established PDS partnership, the school district asked for teachers to take on a different type of leadership role as researchers in their own classrooms. To support this effort, a districtwide action research group was formed. University faculty partnered with teachers to provide extended professional development through the process of classroom-based action research.

Manhattan-Ogden Public Schools serves roughly 6,500 students comprised of two early learning centers, nine elementary schools, two middle schools, and one high school. At the time of the study, the hosting elementary school served approximately 588 students in PK-6 (pre-kindergarten through sixth grade). The student population was approximately 67% white, 10% Asian, 9% Hispanic/Latino, 5% African-American, and 9% other, with 21% classified as economically disadvantaged. Spreer's fourth grade class was made up of 28 students, comprising 13 females and 15 males. Of the 28 students, two were identified as gifted with another student in the process of being tested for the gifted program. A total of four students received supportive services through speech or special education. The ethnic makeup of the students participating in the study consisted of 71% white, 15% Hispanic/Latino, 7% African American, and 7% Asian. Further, 14% of the students were identified as below grade-level benchmark, 32% on grade-level, and 54% score above the grade-level benchmark in the area of reading.

In this fourth grade classroom, the majority of students read on or above grade level. They were proficient readers. However, Spreer observed that many of his students only read when and what they were required to read. In other words, they did not read by personal choice. Recognizing that his students were literate but were developing aliterate patterns (i.e., unwilling to read, although able to do so) led to three questions: 1) What motivates students to read? 2) What leads them to choose to read versus reading only when they are required to? 3) How can the classroom teacher help a group of students who can read, but choose to read only because they are required to?

Because Meritt had been a special education teacher in the district before transitioning to KSU, Spreer and Meritt already had an established professional relationship. As part of the districtwide action research group, they paired as a classroom teacher and university partner and developed an action research plan to address Spreer's classroom observations and unanswered questions. Before beginning the study, a signed release to conduct action research was granted by the district office and the school's administrator. In accordance with procedure, guardian permission for students to participate was garnered through a signed guardian release form. All 28 students were granted permission to participate in the study.

Research on Reluctant Readers

A struggling reader has been defined in multiple and complex ways. It is not as simple as saying who can read and who cannot read. Much research has been devoted to struggling readers, or readers who experience difficulties while learning to read. This difficulty can lead students to be disinterested in reading for information and for pleasure. A report from the National Assessment of Education Progress (NAEP) identified that only 38% of fourth grade students read at the proficient level (Lee, Grigg, & Donahue, 2007). As a result, many teachers focus on identifying struggling readers and begin an instructional intervention or differentiation process, putting into place extra instruction, peer to peer reading, and/or targeted comprehension and fluency strategies. But what about reluctant readers? These readers possess the ability to read; however, they choose not to read. Tovani (2000) stated that for these students "reading has lost its purpose and pleasure" (p. 9). As a result, the focus of instruction must change. Instruction becomes less about developing skills and more about developing positive attitudes in regard to reading, both in and out of the school setting.

There are several reasons that students might become reluctant readers. Beers (1998) provided three categories. Dormant readers are those who enjoy reading but can't find the time to engage in the act of consuming text. The uncommitted reader wavers between positive and negative feelings about reading. These students read to accomplish tasks but have not developed a peer reading group or an enjoyment for reading. Miller (2012) described them as "readers, who possess the reading skills needed for academic tasks, see reading as a school job, but not an activity in which they would willingly engage outside of school" (p. 89). The third category comprises the unmotivated reader. These students have negative attitudes about reading and surround themselves with peers who feel the same (Beers, 1998).

When students have the skills to read, but not the motivation, teachers are charged with not only developing lessons to support these readers but also considering the classroom environment. Miller (2012) suggested various strategies for activating reluctant readers. First, educators should provide ample access to a variety of texts. When students are given options between varying genres, subjects, and forms of text they are interested in, students are more likely to engage in the act of reading for pleasure. Miller also suggested scheduling intentional time to read at school while offering students free choice over the books they read. Underlying these suggested strategies, it is important that educators cultivate an atmosphere that supports the sharing of books and reading, encourages a culture of healthy reading habits, and provides a safe and text-rich environment.

In conjunction, Beers (1998) supported the idea that teachers should develop a culture of reading in the classroom that values the voices and choices of student readers. Investigating communities of readers, Robinson and King (2008) further iterated the power of students participating in a community of readers. They shared that active involvement by students is, in part, central to knowing the joy and satisfaction of reading. Reluctant readers are often hesitant to find new texts, which is compounded when they cannot find text in which they have an interest in (Brinda, 2011). Teachers need to understand their students' reading interests so that they can work to foster their interests, in addition to exposing them to other texts.

Brinda (2011) also addressed aliteracy and the concept that outside factors in students' lives could be impacting and creating their aliteracy. Brinda's literacy ladder showed that for

students to rise from aliteracy, reluctant readers need to be introduced and activated to a text before they read and discuss it. What is critical to the literacy ladder is that family, teachers, friends, and peers all help to hold the ladder together to ensure an impact on the reluctant readers' ascension. These ideas are similar to Beers' (1998) in relation to the people influencing students' attitudes towards reading. When looking for ways to identify a student's cause for being an unmotivated or reluctant reader, the impact of their community and environment within and beyond the classroom needs to be considered. Additionally, some of the factors that are related to unmotivated readers may also be uncontrollable by the student. These factors could be coming together, much like Brinda's (2011) "literacy ladder", by preventing or limiting the students' motivation to read.

Research Methods

Investigating reader motivations using measures that were age appropriate, revealed honest insight, and disclosed what kept students from becoming avid readers was the goal of the study's data collection and analysis. To do this, two techniques were employed; a survey and an interview.

For the first stage of data collection, every student completed a series of 20 survey questions in the format of an elementary reading attitude survey (McKenna & Kear, 1990). The Garfield Survey is a time-tested instrument used to gauge the attitudes of individual readers (McKenna & Kear, 1990). Researched and validated by its originating authors, it is a student-friendly, visual Likert-style scale ranging from 1 to 4. Drawing from the literature review, the researchers identified questions 2, 3, 5, and 13 of the Garfield Survey as questions related attitudes of reluctant readers. These questions highlighted student attitudes toward reading during free time at school, reading for fun at home, spending free time reading, and attitudes about reading at school. All four questions specifically related to student choice and attitude about reading, which was the foundation for the inquiry of the study.

Student completion of the survey involved a single session which took approximately 20 to 30 minutes. Data were analyzed and desegregated to identify students who scored a 2.5 or lower out of a total of four on the identified questions. Of the 28 students participating, eleven scored at or below the associated benchmark. After identifying these students, Spreer conducted individual interviews with each of the 11 students. The interview consisted of five questions derived from and inspired by Miller's (2012) Wild Reader questionnaire. The interview questions were: 1) What types of books do you most like to read?, 2) How often do you read on your own?, 3) Do you think that finding time to read for you is easy or hard? Why?, 4) What is the greatest obstacle that keeps you from reading outside of school?, and 5) Are you successful in finding your own books to read? Why or why not?

Together, Spreer and Meritt triangulated past research, the student survey ratings, and the student interview responses to disaggregate the data. The student interviews answers were individually audio recorded and transcribed and coded by both researchers in efforts to highlight trends. Recordings were listened to separately by each researcher and coded based on student responses. Open coding was used to summarize students' responses. From the codes, characteristics and themes developed, including the factors that influenced students' motivation to read.

No student personal information or recordings were shared with anyone other than the primary and secondary researchers collecting the data, and all names were changed. In taking these

steps, the researchers obtained enough data to advance classroom practice and increase students' interest and motivation to read independently as well as to provide explicit examples when discussing the topic in the university teacher preparation program.

Research Findings and Discussion

According to the data, two major factors influenced students' drive toward self-motivated reading and a supportive community and environment. In addition, the data revealed that students move fluidly between the reluctant reader classifications. Students were not exclusively dormant, uncommitted, or unmotivated readers, but rather some combination of the three depending on their interactions with the community and environment. While the dynamic reader classifications of dormant, uncommitted, and unmotivated are student responses, the community and environment were found to be the stimulus. Figure 1 below displays this relationship:
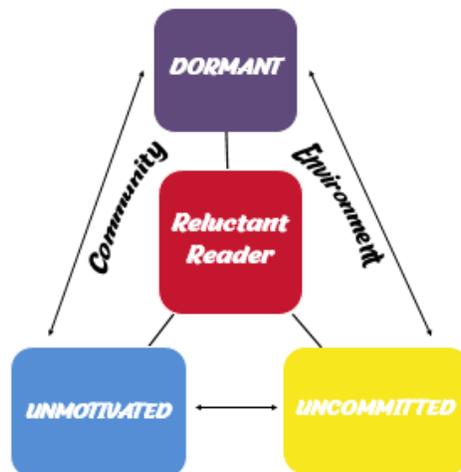

Figure 1: Relationship between Dynamic Reader Classifications, Community, and Environment

In this study, reluctant readers shifted across the categories of dormant, uncommitted, and unmotivated reader depending on the context in which they found themselves, which included the community (i.e., readers or non-readers) and the physical environment. Based on the Garfield Survey data, 39% of the students scored as reluctant readers. This classification was determined as a result of survey scores averaging a 2.5 or lower. Four questions were related to the influences that community and environment hold over young readers. Question 2, how do you feel when you read a book in school during free time? and question 5, how do you feel about spending free time reading a book? related to environmental influences such as time and access. In comparison, question 3, how do you feel about reading for fun at home? and question 13, how do you feel about reading in school? incorporated both environmental and community influences. Community influences included, but were not limited to peers, family, and school models.

The effect of community and the environment was even more evident in the student interview responses. When students lacked supportive factors relating to community and environment, they were more likely to become reluctant readers, shifting between the dormant,

uncommitted, and unmotivated classifications. Easy access to books of interest was an important environmental factor. Students were able to identify specific titles that motivated them to read including the *Harry Potter* series, the *Little House on the Prairie* series, the *Diary of a Wimpy Kid* series, and the *Magic Tree House* series (see Figures 2 and 3).
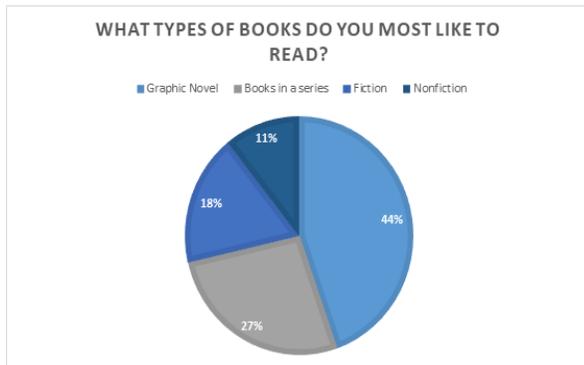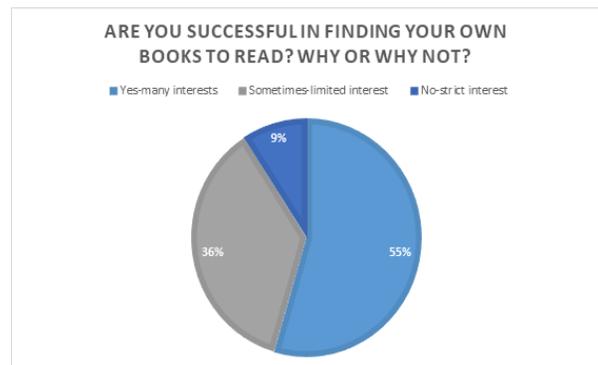

Figure 2: Most-Liked Books

Figure 3: Success Finding Own Books

Students also identified specific genres or content that interested them. General fiction comprised 18% and nonfiction books comprised 11% of the group questioned. Other topics of interest included ghost books, comic books, and animal books. Further, 44% of students interviewed preferred graphic novels while 27% were drawn to books in a series. One student shared, "I know what I want. Non-fiction-books that are real help me learn." Another student commented, "I can't find any comics at school. I like books to have some pictures." In addition, a third student stated, "At home, we don't have any biography books." This seemed to indicate that reluctant readers who were uncommitted knew what they liked but didn't always have access to the books they would choose to read, which prevented them from reading, both at home and at school.

This concern relates to both environmental influences, those involving both time to read and access to specific texts, as well as community influences, relating to the people comprising students' reading interactions at home and at school. Interestingly, 36% of students identified as reluctant readers shared that they read daily in some form. Seventy-three percent of students admitted that finding time to read was hard due to outside influences (see Figures 4 and 5).
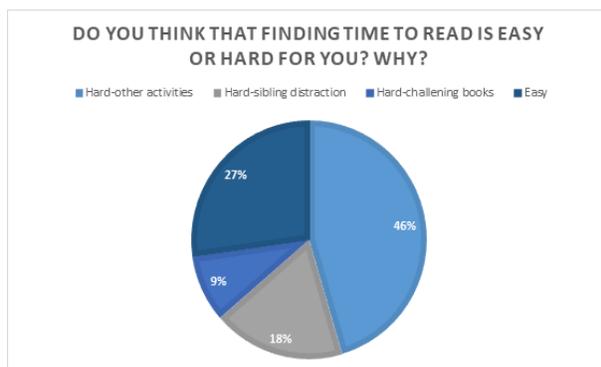

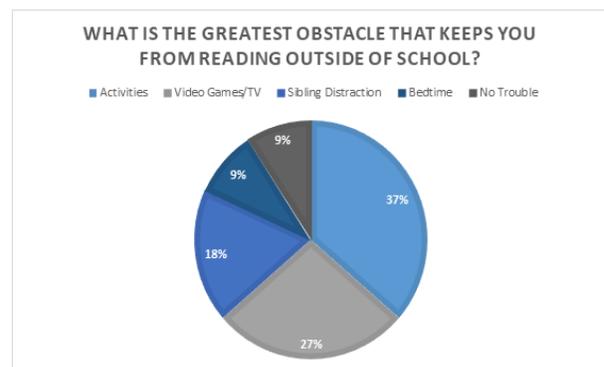Figure 4: Finding Time to Read

Figure 5: Greatest Reading Obstacle

The student's environment was a factor here, and often left students without control of the situation. However, 55% of students indicated that they were successful in being able to find books to read, while 36% said they were sometimes successful. It seemed that these dormant readers were indeed able to read and to find books to read, but they choose not to as a result of environmental and community influences. One student expressed, "I have four practices a week." Another student explained, "I'm watching my brother sometimes and it makes it difficult to read." Figures 4 and 5 summarize student responses to the five interview questions.

Impact of the Study

The action research process is a cyclical one, which prompts additional action and research. This action research project impacted both Spreer's fourth grade classroom, in which the study took place, and Meritt's college classroom at KSU. Based on the data collected, Spreer made immediate changes to his instruction, which included expanding his classroom library with additional books and comic books and asking students what their weekly demands outside of school were each week to reasonable expectations for self-reading. Spreer also recognized the need for further classroom investigation. Spreer is also considering revisions to the survey and interview questions for the next year's group of students to better assess students' communities and environments both in and outside of school. With this extended understanding, he hopes to begin designing an effective plan to better support the needs of reluctant readers in his classroom.

Meritt found that the study's results had the potential to affect his pre-service teachers at KSU, not based just on the findings, but as further reinforcement that teachers benefit from leadership roles in research. Following the study's conclusion, as part of a class discussion at KSU, teacher candidates explored the research findings and considered possible implications. Discussion about the findings led to discoveries and deeper understanding concerning the impact that early literacy has on students. Teacher candidates also realized that impacting reluctant readers comes in various forms and that students can be influenced in many ways. Synthesizing these findings, teacher candidates discussed how to plan future lessons with the understanding that utilizing relatable text and incorporating text discussions within the learning environment supports diverse learners and establishes an environment that reinforces literacy and spans all subject areas.

Without exposure to the findings of this action research project, teachers may struggle in knowing what steps to take to identify possible root causes of reluctant readers, and university professors may lack authentic information to guide teacher candidates. In order to increase educator awareness, Spreer presented the study's research methods and findings to fellow teachers at his elementary school, and as a result began working with the school librarian to explore strategies for supporting reluctant readers school-wide. In addition, Spreer and Meritt shared the research project at the 2019 KSU Graduate Student and Partners Research and Creative Activities Fair, which generated meaningful, data-driven conversations between the researchers, future educators, and university faculty. The study was also presented at the 2020 NAPDS Conference.

Action Research, Teacher Leadership, and the NAPDS Nine Essentials

Essential 4 of the National Association for Professional Development Schools (NAPDS) Nine Essentials of PDS states that an effective PDS partnership includes "a shared commitment to

innovative and reflective practice by all participants" (NAPDS, 2008, p. 3). The action research project described in this article was an excellent example of this principle. The college faculty and teacher researchers involved benefited from this collaboration, but the project also benefited the PK-12 students in the participating classrooms (Teitel, 1997). As in Doolittle, Sudeck, and Rattigan's (2008) example, the district's action research group functioned as a small learning community, with professors of practice supporting classroom teacher researchers as critical friends. This framework "supplied an infrastructure for improved communication and connectedness, trust, and equity between school and university partners" (p. 309). This trust and relationship allowed the participating teachers to take on leadership roles in the learning community as well as in classroom research.

Trust is critical when building transformative PDS partnerships, and the smaller projects that take place within these partnerships. Finding someone who can build upon previous work relationships and prior knowledge of work while also demonstrating dependability is important in relationships such as collaborative action research (Teitel, 2008). In this study, Speer's leadership was encouraged and promoted by the established school-university relationship. Because classroom teachers were empowered to take on leadership roles through action research, his findings directly and positively impacted the learning of his fourth grade students during the study and changed his approach to literacy instruction the following school year. Additionally, he shared his findings with his building peers, and with support from the university partners, produced a model that can be applied in other classrooms through presentations with and without Meritt at local and national conferences. In this way, the action research study reported here also accomplished NAPDS Essential 5, "Engagement in and public sharing of the results of deliberate investigations of practice by respective participants" (NAPDS, 2008, p. 3).

Limitations

The action research study was limited to one district, a single school, and one classroom, resulting in a small sample size. However, this study could be replicated in additional classrooms within the school to create a stronger understanding of the reluctant readers in the school and implications related to the particular school's demographics. Extending the reach of the study to outside classrooms and grade levels would widen the scope of data. Further replication could be conducted in any location. The Garfield Survey is easily available. In addition to survey size, the Garfield Survey results may vary depending on student attitudes and experiences during the interview day or week. Environmental factors such as recent experiences with reading may sway attitudes one way or another. To minimize these effects, it would be beneficial to have students retake the survey additional times in an effort to triangulate student responses. Finally, within the parameters of this study, the classroom teacher conducting the survey and interview had an established relationship with the students. This relationship may have caused bias in his interpretation of the data.

Conclusion

Not all reluctant readers are the same, which means each reluctant reader needs different support. What this research discovered was that simply identifying a reader as dormant,

uncommitted, or unmotivated leaves the student's motivations unknown. Understanding a student's reasons for being a dormant, uncommitted, or unmotivated reader equips teachers with knowledge that can guide interventions. When teachers understand the structure of a student's reading community and environment, they can determine what supports are needed. Is it time that restricts a student from engaging in personal reading? Does lack of access to text create a barrier to success? Is there a respected circle of readers in a student's life? Before schools can expect students to cultivate internal reading motivation, educators must carry out their due diligence to understand student interests, community, and environment. With further inquiry and research, these answers can be revealed and meaningful relationships with text can be fostered.

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Action Research in STEM: Teacher-Led Projects from Primary to Middle School

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Abstract: Action research is one strategic approach teachers can use to positively influence teaching and learning in their classrooms, their schools, and beyond. Action research encourages best practice instruction, supports student learning, inspires school-university partnerships, advances the four professional development school (PDS) core purposes, and cultivates teacher leaders. This article illustrates the impact of teacher leadership on student learning in the STEM areas by reporting summaries of three teacher-led action research projects conducted in partnership with one university's Center for STEM Education. The article concludes that action research is a worthwhile endeavor for both teachers and students.

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

Ten years ago, Merrill and Daugherty (2010) observed, "Teacher leadership has become an increasingly important concept in education because it is believed teacher leaders are positioned to influence school policies and practices, student achievement, as well as the teaching profession" (p. 25). More recently, teacher leadership has been described as a "strategy for schoolwide instructional improvement" (National Institute for Excellence in Teaching [NIET], 2019, p. 3). Action research is one strategic approach teachers can use to positively influence teaching and learning in their classrooms, their schools, and beyond. By publicly conducting and sharing action research, teacher leaders demonstrate the positive impact the action research process can have on best practice instruction, which in turn can positively impact student learning (Wolkenhauer, Hill, Dana, & Stukey, 2017).

Where and in what areas should action research be conducted? The authors of this article believe that investigating teaching and learning related to science, technology, engineering, and mathematics (i.e., STEM) within the context of professional development schools (PDS) is a great place to begin. During a 2014 convocation on STEM teacher leadership hosted by the National Research Council of the National Academies, participants identified "a vast and largely untapped opportunity for STEM teacher leaders to improve student learning" (Olson & Labov, 2014, p. 13). Moreover, action research can be designed to address most – if not all – of the four core purposes of professional development schools: teacher preparation, professional development, inquiry and research, and student learning (Holmes Group, 1986, 1990). Because action research is more likely to be conducted in PDS settings than in non-PDS settings, teachers in professional development schools often experience opportunities for teacher leadership (Garin, 2017). This article illustrates the impact of teacher leadership on student learning in the STEM areas by reporting summaries of three teacher-led action research projects conducted in partnership with one university's Center for STEM Education.

Background/Research Setting

Founded in 2011, Bradley University's Center for STEM Education is a university-wide collaboration dedicated to increasing STEM literacy and improving STEM education and career opportunities for P-12 students (pre-school through high school), preservice and practicing teachers, and others in the Peoria, Illinois area. Co-directed by faculty with backgrounds in science education and biology, the center provides STEM-focused programs, events, and services designed to address the shortage of qualified educators in the STEM areas and support STEM-focused teacher preparation and professional development. In addition, Bradley's Center for STEM Education contributes to the STEM knowledge base by sponsoring and disseminating research on best practices in STEM education, teaching and learning, teacher preparation, and professional development. Many of these projects are conducted as part of Bradley's Professional Master of Arts (PMA) graduate program and focus on effective teaching practices in STEM and their impact on student learning.

Bradley's PMA program in STEM education was designed for practicing P-12 teachers interested in becoming leaders in their field. Offered in two tracks, Elementary STEM Education (focused on primary through middle school) and Environmental Science Education (focused on middle and high school), the 33 semester hour program includes four inquiry-based content courses, five research-based courses, two teacher leadership courses, and two electives. The program culminates with a capstone project that requires teachers to design, conduct, and share the findings of classroom, grade level, or school-wide action research.

Action Research Projects

In his book, *The Action Research Guidebook: A Four-Stage Process for Educators and School Teams,* Sagor (2011) indicated that teacher-researchers must 1) clarify their vision and targets, 2) articulate a supporting theory, 3) implement an action research plan and data collection, and 4) reflect on the data collected before planning informed action to address a classroom- or school-based problem or need. During summer 2018, after conducting in-depth needs analyses and

literature reviews of STEM curricula and/or current issues, all six teacher-researchers enrolled in the Elementary STEM Education master's program wrote action research proposals based on Sagor's (2011) four-stage process.

The year-long design, implementation, and reporting of the action research projects involved an ongoing partnership between Bradley's Center for STEM Education and the six-student cohort. Once Institutional Review Board (IRB) approvals and participation agreements were obtained, the six teacher-researchers implemented their action research plans during fall 2018 under the supervision of a faculty mentor. Twice during the semester, the faculty mentor met with each teacher-researcher to monitor the data collection phase, with additional e-mail contacts as needed. Upon completion of the on-site research, the teacher-researchers and faculty mentor met over a three-week period in January 2019 to analyze the data and draft scholarly manuscripts reporting their research findings. Additional mentoring was provided as needed during spring and summer 2019 as the manuscript submission and revision process continued.

Of the six teacher-researchers in the cohort, four worked independently and two worked collaboratively, resulting in a total of five action research projects. Of the five projects, two focused on case studies about students with special needs and three focused on STEM education. Following a brief review of the literature to provide a theoretical framework, this article summarizes the three STEM-focused action research projects as a basis for discussion of the important connection between action research, student learning, and teacher leadership.

Action Research, Student Learning, and Teacher Leadership

Action research enables teachers to address issues directly and immediately by trying new instructional approaches and reflecting on what does and does not work (Nolen & Putten, 2007). It is a valuable strategy teachers can use to document changes in teaching practice and student learning (Garin, 2017). However, the idea of conducting action research in addition to daily teaching responsibilities can be overwhelming for teachers (Olson & Labov, 2014). When action research is embedded within graduate-level teacher education programs, it has the potential to "develop more knowledgeable teachers, encourage improvement in student learning in schools, and contribute to the professionalization of teaching" (Vaughn & Burnaford, 2016, p. 286).

School-university partnerships that provide practicing teachers with opportunities to engage in advanced STEM-focused opportunities and experiences can "strengthen the content knowledge, pedagogy, research (especially action research), and leadership capabilities of teachers" (Merrill & Daugherty, 2010, p. 21). One year-long study of group action research projects conducted by practicing teachers and supervised by university faculty found that teacher-researchers valued opportunities to collaborate, felt more empowered to improve their teaching practice, and felt more confident participating in decision-making related to curriculum and instruction (Myers & Dillard, 2013). Action research also aligns closely with the four core purposes of professional development schools. As one example, a PDS partnership in New York that used Race-to-the-Top grant funds to sponsor 29 teacher-led action research projects found that many of the projects comprehensively supported teacher preparation, professional development, research, and inquiry, and student learning (Catelli, Carlino, & Petraglia, 2017).

When teachers conduct action research in their own classrooms and schools, they tend to become more reflective of their teaching practices (Lee, Sachs, & Wheeler, 2014), which often

results in instructional improvement (Vaughn & Burnaford, 2016; Rahman, Munakata, Klein, Taylor, & Trabona, 2018). Conducting action research also has the potential to build teachers' professional dispositions and identities as quality teachers, researchers, and leaders. Vaughn and Burnaford (2016) explain, "Action research courses in which students do not simply engage in reflection, but rather are led systematically in critical reflection and critique of schools and schooling [encourage teacher-researchers] to see themselves as change agents" (p. 288).

Two recent studies conducted in professional development schools document the connection between action research, teacher leadership, and student learning in STEM education. In New York, a third-grade teacher and a university faculty member collaborated on an action research project that differentiated instruction by learning mode (e.g., auditory, visual, tactile) and incorporated peer tutoring to increase student engagement and performance in solving multi-step multiplication word problems. Results of the study revealed an 8% increase in student engagement, a 40% increase in student achievement, and documented the teacher-researchers' improvement of eight different instructional strategies (Catelli, et al., 2017). In North Carolina, a fifth-grade teacher and a university faculty member collaborated on an action research project designed to increase hands on science instruction schoolwide (Sikma & Minshew, 2018). After creating several STEM kits that included engaging, adaptable lesson plans and activities, the teacher-researcher used the kits to model innovative science instruction for teachers in the school. Although teachers did not show as much interest in the kits as the research team had hoped, the innovative science instruction systematically provided to three different fifth grade classes increased students' interest and engagement in science-related topics. Additionally, the experience enabled the teacher-researcher to expand her influence beyond the school by serving as a guest lecturer at the partnering university, presenting at a national conference, and writing a scholarly manuscript for publication.

Projects such as these illustrate what Wolkenhauer and colleagues (2017) call "a symbiotic relationship between action research and teacher leadership" (p. 122). Illustrated by the three teacher-led action research projects in the next section, action research encourages teachers to "lead *with* literature, to lead *from* data, to lead *through* sharing, and to lead *by* example" (Wolkenhauer et al., 2017, p. 127).

Three Teacher-Led Action Research Projects

Draw a Scientist: First and Sixth Grade

Background and research problem. Preconceived notions of what a scientist should look like are grounded in the Modern Expectancy-Value model, which includes "expectancy of being successful in a task and having a value for engaging in the task" (Barron & Hulleman, 2015, p. 2). The Modern Expectancy-Value model explains how one's perceptions of personal experiences build their beliefs (Eccles & Wigfield, 2002). For example, students have preconceived notions of what scientists look like and do from what they have – or have not – learned in their lives.

Concepts of expectancy and value influence many people to see only the successful end result of scientific research. However, scientists do not have all the answers. In reality, they often have to test and retest a hypothesis many times before getting a conclusive result, similar to any problem-solving effort. This is why it is important to teach students that anyone can practice the scientific method to solve any problem. Allowing students to explore scientific skills within the

framework of scientists from a variety of disciplines and backgrounds provides opportunities for students to see themselves as scientists.

Draw a Scientist began in 1957, when two anthropologists performed a study asking high school students to draw a picture of a scientist. When faced with such a task, students typically draw an elderly man in a white coat surrounded by equipment in a laboratory (Chambers, 1983; Finson, Beaver, & Cramond, 2010). Even sixty years after the original study, many of the same stereotypes exist. Wondering if they were giving students the right idea of what a scientist really is and what scientists actually do, two teachers in two different Illinois school districts set out to see if exposure to new information about scientists could impact students' perceptions.

Action research process. Ninety first grade students and 119 sixth grade students participated in the study. Given simple instructions, students were given twenty minutes to draw a scientist using crayons, markers, and or colored pencils. After collecting students' drawings, both teacher-researchers tallied different aspects of the drawings, including gender, ethnicity, clothing, and hairstyles. During the next nine weeks, for 40 minutes each week, one-fifth of the participating students received specialized instruction that included research on five different scientists from different backgrounds, races, and genders, plus information about a range of scientific fields and career options. The remaining student participants did not receive the specialized instruction but instead continued with the district's science curriculum. At the end of the nine-week period, all students were again asked to draw a scientist using the same instructions and materials as before.

Research findings and discussion: The comparisons for first-grade students showed a significant change in gender between the two drawings, from 74% male scientists in the first set of drawings to 57% male scientists in the second set. The characteristics of ethnicity, clothing, and hairstyle remained fairly consistent. Sixth grade students' drawings showed a significant change in what they believed typical scientists looked like, progressing from a white man wearing a traditional lab coat to scientists that ranged in gender, clothing type, age, and race. Several students drew pictures of themselves.

Overall, the first and sixth grade students in this study showed a significant increase in depicting scientists as female, although only minor differences were noted in students' perceptions of ethnicity, clothing, and hairstyle. The results suggest that introducing students to a series of scientists could transform their view of what a scientist looks like. The data collected indicate that students' views on the appearance of scientists were impacted as a result of the specialized instruction provided, reminding teachers of the importance of expanding students' knowledge base of what scientists look like and the variety of career fields open to them.

Math Journals and Student Self-Efficacy: Fourth Grade

Background and research problem. Students with higher levels of math anxiety tend to perform lower on mathematical tasks than students with lower levels of math anxiety (Foley, Herts, Borgonovi, Guerriero, Levine, & Beilock, 2017). Math journals are one strategy for reducing math anxiety by improving students' understanding of mathematics. One study of third and fourth-grade students' use of math journals documented improved student understanding of mathematical concepts, more positive student attitudes toward math, and increased student capacity for reflection and self-assessment of learning (Scales, 2000). Similarly, Kostos and Shin (2010) found that

second-grade students' usage of math journals increased students' mathematical thinking and use of mathematical vocabulary, and improved students' conceptual understandings.

Recently, the National Council of Teachers of Mathematics (NCTM) targeted goal of mathematical communication supports the integration of math and writing through activities such as math journals (NCTM, 2019).Wilcox and Monroe (2011) suggested six strategies for integrating writing and mathematics in the elementary classroom: learning logs, think-write-share, note-taking/note-making, shared writing, class books, and alphabet books. With this in mind, one Central Illinois teacher-researcher used a combination of these strategies in her fourth-grade classroom as part of a math journal action research project designed to evaluate students' understanding of math concepts and real-world applications, reveal student successes and productive struggles, and inform her teaching practice.

Action research process. At the beginning of the school year, after completing a math self-efficacy survey created by the teacher-researcher, 13 fourth grade students in the teacher-researcher's class were each given a composition notebook for math writing purposes. Throughout the school year, students were encouraged to use the notebooks as journals to detail math concepts, copy examples, create new models, list math vocabulary, and reflect upon their learning during daily math instruction. Following instruction, students were encouraged to refer to their journals to review concepts and note celebrations and frustrations related to their math learning. Occasionally, the teacher-researcher collected and responded to students' reflections as a means of supervision and encouragement. As a special accommodation, one student in the class maintained a dialogue journal with the teacher-researcher to allow for frequent back-and-forth communication and support related to math homework.

Twice during the school year, each student took home one of two shared class math journals to document real-life connections to the math concepts being practiced in class. Each journal included a checklist to guide students through the process of identifying a real-life math event using a problem-solving strategy learned in class and describing the problem and process in writing. Each class math journal entry was shared and discussed as a class. For research purposes, each shared journal entry was coded using a rubric of understanding/mastery based on the checklist criteria. Then, each entry was rated high, medium, or low. At the end of the school year, the students completed the math self-efficacy survey a second time. The coded shared journal entries and the pre/post survey comparisons were analyzed for student success in relating events in their lives to current math concepts as well as to evaluate personal growth in physical and emotional processing of math competence. Anecdotal notes from the student math journals and the student-teacher dialogue journal were used to supplement the quantitative research findings.

Research findings and discussion. Students' pre/post survey responses revealed minimal change to the questions, how do you feel about math? and, does writing about math help you understand it better? Even so, the individual and shared class math journals were successful in helping students to self-reflect on their learning and to relate mathematical concepts to real-world experiences. In her individual math journal, one student wrote, "I am good with partial products for multiplication but not as good at regrouping." Of the 26 shared class math journal entries, 50% were coded high, 46% were coded medium, and less than 1% were coded low. After working on a real-life math problem and explaining her process for solving it, another student wrote, "I did this problem because it is getting close to Christmas."

Overall, the use of math journals provided students with opportunities for reflection and revealed evidence of growth in their mathematical understanding as they made connections between math and their own lives. The math journals revealed information that the teacher-researcher would not have known had she not incorporated writing into the math curriculum.

Digital Citizenship: Eighth Grade

Background and research problem. In the United States, social media has become an integral – and often unsupervised – part of students' lives (Van den Bulck, 2004). In one study, 24 of 57 elementary-aged students said it was okay to meet with someone they knew only from the internet, and 22 students said it was okay to click on pop-ups (Ey & Cupit, 2011). Unfortunately, the more time students spend online, the more likely they are to have a negative online experience (LaRose, Rifon, & Enbody, 2008). Best practice for improving the safety of online interactions involves informing students of the dangers and teaching strategies for avoiding or dealing with these dangers (LaRose et al., 2008). To improve the safety of the online activities and choices of eighth-grade students in a rural school, one teacher-researcher collaborated with colleagues to systematically compare three digital citizenship instructional programs: Safe Online Surfing (Federal Bureau of Investigation [FBI], n.d.); Be Internet Awesome (Google, 2017); and Digital Citizenship (Common Sense Education, 2018).

Action research process. Sixty-seven eighth grade students at one middle school were placed into three groups. Each group was assigned a different digital citizenship program: Safe Online Surfing (Group A); Be Internet Awesome (Group B); Digital Citizenship (Group C). All three groups had similar student characteristics except for Group A, which included nine students with individualized education programs (IEPs).

At the beginning of the study, each student was interviewed to get baseline measurements of online etiquette and behaviors before the curricula were taught. Additionally, students were surveyed to better understand their current internet use and whether they had been an online victim or victimized someone else online within the past month. After all interviews and surveys were conducted, the digital citizenship lessons were taught each day during class time for a period of nine weeks. Each program was taught by the same teacher. Throughout each program, students kept daily logs of three to five sentences reflecting on what they learned during each lesson.

Once each program concluded, students were interviewed and surveyed again using the same questions. Students' pre- and post- responses were averaged by group and compared for changes in thinking and behavior. In addition, students' daily logs were reviewed and categorized by the teacher-researcher according to four areas of digital citizenship: manages digital identity, understands intellectual property, engages in positive attitudes online, and keeps personal data secure (International Society for Technology in Education, 2012).

Research findings and discussion. Between the beginning of the study and the end of the study, the majority of the interview and survey response means for each group improved on all questions, and the sum of the change in means for each group was positive. At the beginning of the study, students in Group A spent the largest amount of time online compared to Groups B and C. After the study, time spent online decreased for students in Groups A and C, but students in Group B showed a slight increase. Also, at the beginning of the study, several students in all groups reported being victims of online bullying or victimizing someone online. At the end of the study,

the number of students participating in online bullying decreased, although witnessing online bullying and being victimized online remained about the same.

The three digital citizenship programs did not influence how much time students spent online or change the likelihood of negative student interactions online, but the need for a digital citizenship program was verified based on the amount of time students reported spending online each day. Analysis of students' daily logs revealed that all three programs taught students how to keep their personal data secure and how to engage positively online. All three programs also taught students how to manage their online identity, but Google's Be Internet Awesome stood out over the two programs in this area. Common Sense Education's Digital Citizenship was the only program that students reported learning about digital ownership of intellectual property.

Overall, the teacher-researcher concluded that, of the three digital citizenship programs, no single program conclusively emerged as most beneficial for students. Rather, all three programs rendered different benefits regarding students' understanding of how to be safer online.

Discussion and Implications for Practice

As the three teacher-led action research projects in this article illustrate, action research encourages teachers to "lead *with* literature, to lead *from* data, to lead *through* sharing, and to lead *by* example" (Wolkenhauer et al., 2017, p. 127). All three projects were grounded in scholarly literature (leading *with* literature), the conclusions drawn in all three projects were based on the data collected (leading *from* data), and all three projects were shared at state-level education conferences and reported in the form of scholarly manuscripts (leading *through* sharing). At the time of this writing, one research article has been published (Benson-O'Connor, et al., 2019) and the other two are under peer review.

In addition to leading with literature, from data, and through sharing, the teacher-researchers featured in this article continue to lead by example. One teacher leader reflected, "Pursuing this action research project made me more aware of my teaching goals and the importance of including data in my reflections." After conducting the Draw a Scientist project, this kindergarten teacher wrote and received a grant to fund a butterfly garden at her school. She stated, "Now my students can be scientists in a real project!" Along with continuing to use math journals in her fourth-grade classroom, a second teacher leader is promoting the student benefits and instructional processes of math journals by providing professional development for teachers in her region and leading social media discussions based on her recently-published article. After presenting his research findings to fellow teachers and administrators, a third teacher leader has been asked to lead the process of developing and implementing a district-wide digital citizenship program so that all students benefit. "This is still an ongoing project," he explained, "but it will strengthen our curriculum and make students feel safer."

Because these teacher-researchers are frequently called upon in their schools and school districts to supervise teacher candidates, mentor new teachers, and provide professional development, conducting action research enabled each one to accomplish the four PDS core purposes of teacher preparation, professional development, inquiry and research, and student learning (Holmes Group, 1986, 1990). In this way, action research has the potential to inspire the development of small-scale school-university partnerships, one or two teachers at a time.

Limitations

This article has two limitations. First, the background/research setting that serves as a basis for the three teacher-led action research projects is loosely defined as a school-university partnership between the teacher-researchers and a faculty member in Bradley University's Center for STEM Education. Although the setting is not a formal PDS, illustrating how universities can support teachers in conducting action research through loosely defined partnerships is intended to provide a possible starting point for non-PDS readers. Second, only summaries of the three teacher-led action research projects are reported in order to provide multiple examples of the connection between action research, student learning, and teacher leadership within one article. In addition to this composite article, each teacher-researcher individually or collaboratively wrote a full research article for publication in a peer-reviewed journal. Readers are encouraged to refer to each study's complete report as each article is published.

Conclusion

The federal Every Student Succeeds Act (ESSA) defines evidence-based professional development as "job-embedded activities that are informed by student and teacher need and designed to support strong curriculum and content" (NIET, 2019, p. 4). As the teacher-led action research projects described in this article illustrate, action research is a powerful form of evidence-based, job-embedded professional development that also encourages teacher leadership. Action research becomes teacher leadership when teachers use their research findings to inform professional development and teaching practices beyond their own classrooms (Merrill & Daugherty, 2010). When teacher leaders share action research findings with colleagues, policymakers, and the public, they positively influence student learning by contributing to ongoing development of the education profession (Lee et al., 2014). Whether the topic under investigation involves drawing a scientist, using math journals, or comparing digital citizenship programs, action research is a worthwhile endeavor for both teachers and students; it encourages best practice instruction, supports student learning, inspires school-university partnerships, advances the four PDS core purposes, and – perhaps most important - cultivates teacher leaders.

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Enacting Equity through Action Research in Professional Development Schools (PDS)

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Abstract: The 12 action research articles in this special issue of *School-University Partnerships,* themed "The Impact of Teacher Leadership on Student Learning in Professional Development Schools," illustrate that the tangible, practical goal of ensuring equity among teacher practice and student outcomes is fundamental to what it means to be a PDS. This closing article links several of these action research projects to NAPDS Essential 1 by describing how these PDS partnerships used action research to develop healthy teacher leadership habits, yield positive student learning outcomes, and increase opportunities to enact equity.

KEYWORDS: *action research, equity, professional development schools (PDS), teacher-researcher*

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.

In P-12 (pre-school through high school) education, change and innovation efforts are increasingly focused on diversity, equity, and inclusivity to address persistent problems of practice around teaching and learning. The 12 action research articles reported in this special issue of *School-University Partnerships*, themed "The Impact of Teacher Leadership on Student Learning in Professional Development Schools," illustrate that the tangible, practical goal of ensuring equity among teacher practice and student outcomes is fundamental to what it means to be a PDS.

Because PDS partnerships provide an ideal backdrop for addressing practical problems around equity in realistic ways (Corrigan, Weber, Beebe, Zenkov, & Semple, 2017; Fall, 2018), the potential is great for PDS models to address the unique needs of marginalized students (Benson, Curlette, Ogletree, & Hendrick, 2017; Putman, Cassady, Smith, & Heller, 2016; Rowe, Urban, & Middleton, 2016). Recognizing this, Essential 1 of the National Association for Professional Development Schools' Nine Essentials of PDS advocates for "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" (NAPDS, 2008, p. 2). This closing article links several of the themed issue's action research projects to NAPDS Essential 1 by describing how these PDS partnerships used action research to develop healthy teacher leadership habits, yield positive student learning outcomes, and increase opportunities to enact equity.

Equity in Professional Development Schools

As the articles in this themed issue illustrate, PDS partnerships trust the experiences and influences of teacher leader-generated research to establish policies and procedures that drive education decisions. Instructional personnel are no longer satisfied with top-down administrative mandates that demonstrate lack of regard for classroom-based knowledge and expertise. Teacher leaders are motivated to craft their own solutions to problems they face daily and are especially prone to embrace improvement ideas that are generated through collaborative innovation (Hunzicker, 2013, 2017; Jeffries, 2018). The articles in this themed issue indicate that combined efforts of teacher leaders and university faculty grounded in an ethic of social justice are effective toward improving educational outcomes for students. These partnerships are effective because they continuously examine classroom practice as the nexus of student success by turning a critical lens on schools as institutions of continuity and classrooms as initial sites for powerful change.

Action research illustrates the relevance of P-12 education institutions to create spaces for inclusivity to a wide breadth of students so that the diverse academic needs of students in classroom settings can be addressed. Unfortunately, many institutions writ large are still striving to effectively utilize the existing theoretical findings that have permeated the literature for decades (Banks, 1979, 1982; Boutte, 2008; Carlson, 1987; Gay, 2004; Hollins, King & Hayman, 1994; Jackson, 2009; 2018; Ladson Billings, 1995, 2009; Noblit, 1993). Action research exposes areas for growth and development regarding the need to effectively incorporate instructional methods that acknowledge diversity in its many forms.

Educators who successfully use theory within a cyclical pattern to design policy that evolves from daily practice to support continuous explorations of instructional expertise are the engine of PDS partnerships. With an overt commitment to continued improvement, PDS research is expanding its goal of improving teacher practice by acknowledging this fundamental responsibility that classroom leaders partnering with university faculty must embody and enact equity. At this practical level, educators can more swiftly utilize diverse perspectives to build theory and influence decision making spaces where policy is born. Such action research settings offer opportunities to disrupt pervasive inequities in education and inform not only P-12 teaching and learning opportunities but also teacher training programs in higher education (Chevalier, & Buckles, 2019; Málovics, Juhász, Méreiné Berki, Mihók, Szentistványi, Pataki, Nagy & Tóth, 2018).

Enacting and Embodying Equity through Action Research

This themed issue includes strong examples of effective PDS partnerships that have developed healthy teacher leadership habits, yielded positive student learning outcomes, and increased opportunities to enact equity. For example, Meritt and Spreer utilized their PDS partnership to investigate fourth-grade students' reading motivation. Their study revealed that teachers are better equipped to address the diverse needs of students once they understand their students' home communities and environments. Students' contextual lives in and out of school influence their relationship to reading texts and literacy in general. Findings from this research suggested that direct adjustments to instruction, which included expanding the classroom library with relatable texts to foster student-oriented discussions, increased literacy engagement for

diverse learners. Ultimately, this action research process was noted by the authors as cyclical in nature because it tested existing theories about literacy and facilitated the generation of new literacy practices across multiple content areas.

Many of the contributions to this themed issue successfully examined the process of conducting action research to support the cyclical nature of examining practice, testing theory, and generating policy in PDS settings. These sites of proactive contestation nurture the focused intent of PDS partnerships to improve learning, teaching, and leading around issues of diversity, inclusivity and equity. As another example, the assumption that gifted students are virtually capable of teaching themselves and therefore not rightfully positioned among the group of students considered diverse; the action research project conducted by the Polly led partnership explored the delicate association between motivation and growth mindset with third-grade gifted math students. Teacher leaders and candidates learned the value of differentiated and personalized instruction to keep gifted students engaged through choice and applied lessons. This action research project demonstrated that guiding encouragement from the classroom teacher supported persistence through complex and multi-step mathematical tasks. The outcomes of this study recommended the systematic examination of practice, but more importantly noted the positive outcome measures bolstered by the qualifications of the participant teachers. An increased sense of confidence gave these teacher-researchers credibility among their administrative colleagues to drive decision making and help set policy.

Conversely, the PDS partnership led by Mallon explored the self-confidence and participation of fifth-grade special education students with the goal of increasing their range of strategies for heightened engagement during whole class instruction. This action research study successfully noted methods that teachers can use to assist diverse groups of students recognize areas where they experience difficulty and specific skills to address identified areas for growth. The findings of this study highlight the importance of teaching normalized social skills used in school settings to a range of students who may come to school in need of more practice with fundamental behaviors that aid in academic performance. The necessity for teachers to recognize these needs among a diverse population of students cannot be underestimated. Action research in this vein advances our understanding of this critical instructional practice and how it can be successfully fostered in a supportive PDS partnership.

Of the three teacher-led action research studies reported by the Benson-O'Connor team, one in particular drove home the critical nature of teaching for equity. This project was grounded in the Modern Expectancy-Value model that suggests students' achievement and motivation are tightly coupled with their beliefs about the value of the assigned task and their perceived expectations for success. Students in first and sixth grades were polled regarding their socially constructed concepts of what a scientist looks like and does in that line of work, and regrettably, 60 years beyond the initial study on this concept produced little progress in the diversification of students' perceptions of this profession. This study, however, revealed that equity conscious instruction has the potential to reorient students' concepts toward progressive perceptions regarding the age, gender and race of a scientist. Considering Clark and Clark's (1939; 1950) research on colorism and racial preference, this study recognized the development of and external influences shaping personal consciousness toward an exclusive or inclusive nature. This PDS team noted the ability of action research to acknowledge theory, process data born from practice, and shape policy through dissemination and modeling to increase teaching and learning for equity.

Another featured PDS team led by Burns embraced the challenge of engaging in action research at an urban, high-poverty, low-performing school serving a high population of migrant and undocumented families. While the site was labeled as a turnaround school and positioned for institutional conservatorship, teacher leaders recognized the power of perception and worked to improve academic achievement through student leadership and engagement. The theory upon which this study was built implies that other urban schools labeled as failing and facing a takeover from an external entity might consider the impact of collaborative inquiry of this nature. The action research conducted at this site demonstrated the potential of cyclical inquiry to understand complex problems centered on equity issues that can be addressed through the PDS model.

Practice Architecture in Professional Development Schools

An additional contribution from the Burns PDS team was their recognition of the PDS model to create a hybrid third space. This third space or redirection of the binary created via PDS action research is a form of practice architecture. The prioritization of practice in the theory-practice-policy cycle is aptly described within the notion of practice architecture as a place where educational practice is deconstructed to understand its essence, its implicating factors, and its relationship to other formalized practices (Edwards-Groves, 2018; Goodyear, Casey, & Kirk, 2017; Mahon, Francisco, Kemmis, & Lloyd, 2017; Phelan & Griffiths, 2019). Ultimately, practice architecture and processes like action research that emphasize the hybridity theory maximize the cooperation of the two binaries - schools where practice lives and universities where theory lives - and utilize their combined power to affect policy, the third space where schools and universities are not typically as active. The PDS model standardizes this relationship while validating and strengthening the knowledge production of school-university partnerships.

Another major contribution of this themed issue is its examination of how action research further informs our understanding of the cyclical nature of theory, practice, and policy and speaks to the broader community through education. Action research continues to offer opportunities to model the building of infrastructure, as noted in the Roselle partnership work, which recommended sanctioning the role of teacher leader as a professional function under the expectation that teacher practice and educational pedagogy would routinely be evaluated among a community of experts of practice (school faculty) who are collaborating with experts of theory (university faculty). The effectiveness of this action research project, as well as others included in this issue, endorses the institutionalization of the PDS model as policy among education organizations.

The power of PDS models to drive policy is further seen in the action research from D'Amico and colleagues. This study's focus on developing effective pre-service, induction, and initial experiences for teachers addressed the eminent struggle in education to attract and retain strong teachers, especially in the STEM (science, technology, engineering, and mathematics) content areas. This study reiterated, along with others in this themed issue, the importance of teacher professionalization through conference attendance, continuing education, and structured opportunities to collaborate actively with university faculty in meaningful ways that influence teachers to remain in the classroom. This study also noted that simply keeping teachers in the classroom minimally addresses the ultimate goal of PDS partnerships by emphasizing the critical perceptions of administrators who acknowledged the increased effectiveness of early career teachers who had invested in PDS work compared to those who had not.

And last, the residual impact of PDS relationships on the professional preparation and career trajectories of early career teachers and the renewed investment and sense of service to the profession by veteran teachers is echoed by the Nettleton collaborative. The idea that PDS-supported early career teachers exhibit traits of enhanced instructional ability is reinforced by established research citing positive outcomes for participants (Castle, Fox, & Souder, 2006; Dodman, Groth, Ra, Baker, & Ramezan, 2017; Fisher-Ari, Martin, Burgess, Cox, & Ejike, 2018). This project acknowledged the realistic expectations of action research, with a reminder that the act of performing research often leads to surprise discoveries and teaches unexpected lessons. The action research conducted within each of these PDS partnerships is not only geared toward outcomes, but also toward processes that generate continued curiosity among school and university faculty and fuel the cycle to think more deeply, learn more broadly, and do more collaboratively.

Keeping the Cycle Alive through Action Research

The greater implications of this work extend well beyond PDS settings, and that is why PDS partnerships and the knowledge created at these sites is so vital to the growth, development, and realization of the NAPDS Nine Essentials, and especially NAPDS Essential 1. Action research propels the theory, practice, and policy cycle, and encapsulates some of the most meaningful work conducted around what teachers do in classrooms. Explorations of the relationship between theory and practice or practice and policy often prioritize the theoretical frameworks born from practice as well as the strategic policies that govern practice but rarely focus explicitly on practice as the cyclical driver (Lynch, Rowlands, Gale, & Skourdoumbis, 2017). Action research disrupts this misconceived dyad and recognizes the critical nature of locating practice as the fundamental component of education knowledge and innovation (Feldman & Orlikowski, 2011; Greene, 2009). As a result, the everyday actions of teacher practice become responsible for the reproductive structures that constitute curriculum and instruction. Thus, action research rightfully captures the evolution of excellence in practice and frames the crafting of standards across theoretical knowledge and policy documentation.

Conclusion

In the opening article of this themed issue, Hunzicker states, "Action research is important." Indeed, action research is a perfect vehicle for innovation through intentional inquiry and professional development (Efron, & Ravid, 2019; Mertler, 2019). Exemplified in this themed issue – and within the greater PDS network – are educators who lead the nation in partnership-oriented educational renewal through their commitment to equity and to impacting the broader community through education. Yet according to NAPDS Essential 1, action research begs for more explorations of teacher practice, more clarification of school policy, and more refinement of educational theory. In PDS and beyond, educators must keep doing action research until higher levels of teacher satisfaction, positive student outcomes, and ultimately civic engagement based on socially just understandings of our world are realized.

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