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URBAN HIGH SCHOOL ADMINISTRATORS SECOND ORDER CHANGE

The purpose of this study was to investigate the possibility of a relationship between second-order change leadership behaviors of high school administrators and changes in student achievement on the Florida Standards Assessment English Language Arts/Reading component and the Algebra I End of Course examination in two large urban school districts. This study further sought to determine the leadership behaviors that high school administrators felt had the most impact on student achievement. As a mixed-method research study (N = 69), quantitative and qualitative data were collected for analyses. Quantitative data were collected via the Principal Actions Survey (PAS) developed by La Cava (2009). A Pearson r correlation was conducted to determine if there was a relationship between individual principal scores on the PAS and changes in student achievement from school years 2016 and 2017. Qualitative data were collected via telephone interviews using the Second-Order Change Principal Interview Protocol (Taylor, 2007). A thematic analysis was utilized to determine themes among administrator responses, specific to the seven leadership responsibilities determined by Marzano, Waters, & McNulty (2005). Themes were determined by frequency of occurrences among interviewees. The quantitative analysis determined that there was no statistically significant relationship among the mean scores of principals on the PAS and changes in student achievement. Qualitative analysis revealed themes specific to administrator change implementation. Themes included: creating a culture of change, data-driven professional learning communities, professional learning, development, and administrator leadership.

As educational leadership theories evolve, attention has turned to the role of school districts and educational leaders in creating the supports necessary for teachers to sustain engagement with challenging new ideas about their practice (Galluci, Van Lare, Yoon, & Boatright, 2010; Gu & Sammons, 2016). The type of principal leadership is moderated by specific factors, including accountability for student learning. Instructional leadership refers to those who have a major focus on creating a learning climate free of disruption, a system of clear teaching objectives, and high expectations for teachers and students (Hattie, 2009). Fullan and Knight (2011) identified the need for principals to be change agents at the instructional and organizational levels to promote systematic change.

Marzano, Waters, and McNulty (2005) identified 21 responsibilities of administrators of which seven were coined factors or behaviors of second-order change: (a) knowledge of curriculum, instruction, and as-

assessment; (b) optimizer; (c) intellectual stimulation; (d) change agent; (e) monitoring/evaluating; (f) flexibility; and (g) ideals/beliefs. The authors wrote that second-order change leadership behaviors promote “deep change” within educational organizations and involves departures from the expected both in defining a given problem and finding a solution. Although accepted by many as the preferred leadership approach, transformational leaders may or may not bring about second-order change defined as a significant departure from the norm accompanied by a sense of urgency (Taylor & La Cava, 2012). Second-order change requires instructional leadership focused on improving student learning. The study was structured to investigate the specific relationship between perceived second-order change leadership factors or behaviors of high school administrators and student achievement outcomes of the schools they served.

Purpose

The purpose of this study was to investigate the possibility of a relationship between second-order change leadership behaviors of high school administrators and changes in student achievement as measured by the Algebra 1 End-of-Course (EOC) Examination and Florida Standards Assessment (FSA) English and Reading Component for school years 2016 and 2017. The researcher analyzed data using the self-reported actions of high school administrators and students’ achievement outcomes.

Another purpose of this study was to investigate prior conclusions of La Cava (2009) and Kearney (2012) who researched the correlations between Florida Department of Education assigned elementary school grades and self-perceptions of second-order change leadership behaviors among principals in high poverty (60% or more) elementary schools in two different school districts.

Conceptual Framework

Shifts in educational reform have reinforced “demands for greater accountability, especially appeals for the use of more outcome-based measures...” (Lunenburg, 2010, p. 1). This shift has brought with it dramatic changes in what public education needs from principals (Bolman & Deal, 2018). In the new era of accountability, administrators “need to be educational visionaries; instructional and curriculum leaders; assessment experts; disciplinarians; community builders; public relations experts; budget analysts; facility managers; special program administrators; and expert overseers of legal, contractual, and policy mandates and initiatives” (National Association of Secondary School Principals, 2013, p. 1). Policy-makers aiming to improve schools on a large scale invariably assume that the success with which their policies are implemented has much to do with the nature and quality of local leadership, especially leadership at the

school level (Leithwood & Jantzi, 2006).

Early models of instructional leadership may be prescriptive and describe instructional leadership as the integration of the tasks of direct assistance to teachers, group development, staff development, curriculum development, and action research (Glickman & Gordon, 1995). DuFour (2002) observed that instructional leaders should have knowledge of curriculum, instruction, and assessment. Hallinger (2003) put forth three dimensions of instructional leadership, noting that instructional leaders: (a) define the school's mission; (b) manage the instructional program; and (c) promote a positive school climate that is conducive to learning (p. 6). Consistent with Hallinger and DuFour, Stewardt (2006) suggested that instructional leadership focuses on school goals, the curriculum, instruction, and the school environment. Inherent in the concept of instructional leadership is the notion that learning should be given top priority, and everything else revolves around the enhancement of learning (Jenkins, 2009). As school administrators take on more active roles as instructional leaders, there must inherently be "a redefinition of the role of principals, one that removes the barriers to leadership by eliminating bureaucratic structures and reinventing relationships" (Jenkins, 2009, p. 37). Most recently, Gurlley, Anasy-May, Oneal, and Dozier (2016) discuss the necessity to implement such behaviors and practices while incorporating current practices as a result of school accountability.

Bolman and Deal (2018) discuss the necessity to change the normative structure of school leadership by evaluating the lenses through which leadership is accomplished. Fullan (1993) noted that change leadership comes with obstacles. He discussed the need to diagnose the needs of an organization and map the terrain or analyze the relationships and how one change may impact another before implementing change which in turn may cause disruption if the organization is stabilized. As principals restructure educational organizations to meet the needs of stakeholders, "Principals are responsible for working with the entire spectrum of stakeholders: from students to school board members, parents to policy makers, teachers to local business owners, support staff to union officials" (Mangin, 2007, p. 319). The Wallace Foundation (2013) believes that principals should perform five key functions to include: (a) shaping a vision of academic success; (b) creating a climate hospitable to education; (c) cultivating leadership in others; (d) improving instruction; and (e) managing people, data, and processes to foster school improvement. Principal perception and, in turn, principal behavior determine the extent to which school leaders influence organizational change for student improvement (Urick & Bowers, 2014). There has been "consistent evidence that demonstrates the potential positive and negative impacts of leadership, particularly principal leadership, on school organization, culture and conditions, and, through these, on the quality of teaching and learning and student achievement" (Day, Gu, & Sammons, 2016, p. 223).

Second-order change deviates from the norm and an alternative approach is carried out to meet the needs and priorities of educational institutions. Given this notion, “second-order change requires a different approach to leadership” (Marzano et al., 2005, p. 116). Such change can be characterized as innovation-driven, irreversible, and requiring fundamental change from current practice. Marzano, Waters, and McNulty (2005) identified 21 leadership factors or behaviors that are important for school leaders, seven of which they identified as factors of second-order change: (a) knowledge of curriculum, instruction, and assessment; (b) optimizer; (c) intellectual stimulation; (d) change agent; (e) monitoring/evaluating; (f) flexibility; and (g) ideals/beliefs (Marzano et al., 2005, pp. 70-72). Furthermore, Marzano et al. (2005) expressed the belief that second-order change leadership must be present among school leaders to aid in the effective transformation of schools in relation to policy and structural and instructional decision-making processes. These priorities cannot be met with traditional leadership approaches; they must be accomplished through second-order change leadership behaviors (La Cava, 2009).

Research Questions

This study was guided by four research questions:

- 1) What are the overall Principal Actions Survey (PAS) scores for high school administrators and the seven leadership factors of second-order change, determined by Marzano, Waters, and McNulty (2005)?
- 2) To what extent, if any, does a relationship exist between the scores of high school principals on the Principal Actions Survey (PAS) and the change in student achievement from the school year 2016 to 2017 (Algebra 1 End-of- Course Examination and Florida Standards Assessment English Language Arts/Reading)?
- 3) How do reported second-order change leadership behaviors of high school administrators compare with the findings of elementary school administrators reported by La Cava (2009) and Kearney (2012) on the Principal Actions Survey (PAS)?
- 4) According to high school administrators, what leadership behaviors have the most influence on changes in academic student achievement?

Methodology

This study utilized a mixed-methods research design to investigate the possibility of a relationship between second-order change leadership

behaviors of high school administrators and changes in student achievement from the school year 2016 and 2017 on the Florida Standards Assessment ELA/Reading component and the Algebra 1 End-of-Course Examination. Through purposive sampling, participants were selected based on the criteria that they were current high school administrators (i.e., principals and assistant principals) in the traditional public-school sector, excluding charter and special schools, in two large urban school districts in Florida.

Population

The targeted population for this study consisted of approximately 45 high school principals and 190 high school assistant principals in two large urban diverse school districts in Florida. The research specifically targeted principals and assistant principals in the high school setting. Data were collected from administrators working within the public-school sector, not including charter high schools or special schools. Through purposive sampling, 69 high school administrators made up the sample for this study. Pseudonyms used in this study for the two school districts are LUSD 1 and LUSD 2.

LUSD 1 is a large urban school district located in Central Florida. As the 10th largest school district in the United States and the fourth largest school district in Florida at the time of the study, LUSD 1 served approximately 203,000 students from diverse racial and ethnic backgrounds. Students within the district represented 200 countries and spoke 167 languages. As the second largest employer in Central Florida, LUSD 1 had approximately 24,000 employees, 548 of whom were school level administrators.

At the time of the study, LUSD 2 was also a large urban school district and located in south Florida. As the 11th largest school district in the United States and the fifth largest school district in Florida, LUSD 2 served approximately 189,000 students from various racial and ethnic backgrounds and employed approximately 21,000 individuals. Students in the school district represented 198 countries and spoke 150 languages and dialects.

Instrumentation

The Principal Actions Survey (PAS), developed by La Cava (2009), was used to measure the self-perceived leadership behaviors of high school administrators. The PAS consisted of 22 items. Items contained within the survey were specifically related to the following leadership factors: (a) knowledge of curriculum, instruction, and assessment; (b) optimizer; (c) intellectual stimulation; (d) change agent; (e) monitoring/evaluating; (f) flexibility; and (g) ideals and beliefs. These factors are

the seven second-order change leadership behaviors of the balanced leadership framework of responsibilities (Marzano et al., 2005). Initial survey items allowed respondents to select demographic data and educational background. The PAS, consisting of 22 statements specific to second-order change leadership behaviors and utilized a 5-point Likert-type scale, giving respondents the option to select: strongly agree, agree, neither agree or disagree, disagree, or strongly disagree. Two items on the PAS allowed respondents to share specific leadership experiences regarding leadership behaviors and challenges through open-ended responses.

Data Analysis

A mixed-methods research design was used to collect data and investigate a possible relationship between second-order change leadership behaviors and student achievement. Inferential and descriptive statistics were utilized to analyze quantitative data. After the survey closed, data were downloaded to an external spreadsheet. Data analysis was completed to determine the relationship between second-order change leadership behaviors and student achievement. A correlation was utilized to investigate if a relationship existed between the dependent variable of second-order change leadership behaviors and the independent variable of student achievement.

The qualitative analysis was completed using thematic analysis which calls for examining common themes among administrator leadership behaviors (Lunenburg & Irby, 2008). Thematic analysis permits the identification, analysis, and reporting of patterns within data (Braun & Clark, 2006). According to Braun and Clark, a theme captures something important about the data in relation to the research question and represents some level of patterned response or meaning within the data set (2006, p. 82).

Findings

Research Question 1

What are the overall Principal Actions Survey (PAS) scores for high school administrators and the seven leadership factors, determined by Marzano, Waters, & McNulty (2005)?

The means of the self-perceived leadership behaviors of administrators were determined applying administrators' PAS results. Specific questions were aligned to each of the seven leadership factors. After survey completion, the mean of the sum and the means were calculated for each individual leadership factor. Table 1 displays the PAS results.

Table 1

Principal Actions Survey Sums, Means, and Standard Deviations by Leadership Factor (N=69)

	Factor Items (Item Number)	Mean of Sum*	Mean	Standard Deviation
Monitoring/ Evaluating	16, 19	9.04	4.72	0.9
Change Agent	2, 3, 9, 13	18.54	4.63	1.41
Ideals/ Beliefs	14, 15, 18	13.83	4.6	1.14
Intellectual Stimulation	7, 12, 22	13.61	4.52	1.32
Optimizer	4, 6, 8, 20	17.68	4.38	1.81
Knowledge of Curriculum, Instruction, and Assessment	10, 17, 21	13.26	4.38	1.36
Flexibility	5, 11	8.33	4	1.59

Research Question 2

To what extent, if any, does a relationship exist between the scores of high school principals on the Principal Actions Survey (PAS) and the change in student achievement from the school year 2016 and 2017? (Algebra 1 End-of-Course Exam and FSA English Language Arts/Reading)

Research question 2 was addressed through the use of a Pearson r correlation to investigate the possibility of a relationship between scores of high school principals on the PAS and the change in student achievement on the Florida Standards Assessment (FSA) English Language Arts/Reading component and the Algebra 1 End-of-Course (EOC) examination for the years 2016 and 2017. For this analysis, the sample consisted of 14 high school principals. Administrators who were not high school principals were not included because it would represent an inaccurate sample in relation to the research question as there would be duplications within a high school. Though a total of 22 principals completed the PAS, only 14 principals reported their work location so that the achievement data could be identified and matched. These 14 constituted 64% of the entire sample of principals participating in the study. For the purpose of analysis, the researcher put in missing values into the Statistical Package for Social Sciences (SPSS) platform, and this yielded a total of 14 useable responses on

the PAS.

Principals were ranked from highest to lowest based on their PAS score. Additionally, each principal was placed into one of three tiered groups based on their PAS score. The collective means for each tier were calculated for further analysis. Tier One, consisting of principals 4, 7, 18, 34, and 36, obtained a mean value of 4.78. Tier Two, consisting of principals 3, 11, 14, 16, and 39, obtained a mean value of 4.51. Tier Three, consisting of principals 12, 13, 15, and 17 received a mean value of 4.06. The means presented for each tier were aligned with the ranking order based on the PAS scores for each respondent.

Principal demographic data were gathered for the purpose of analysis. The two highest ranking principals by PAS score had at least 10 or more years of administrative experience. The highest-ranking principal by total PAS score was a white male and one of three principals reported that they worked at a school with a poverty level of 80- 100%. The four highest ranking principals, by total PAS score held a master's degree and not a higher degree. The lowest ranking principal, by total PAS score and mean, was also a white male with 10 or more years of administrative experience. Similarly, this respondent also held a master's degree.

To conduct further analysis, the total score for each of the 14 principals by leadership factor was calculated. To calculate the total score for each principal by leadership factor, the sum of items factored into each leadership factor was calculated. Through the utilization of the 5-point Likert scale, each principal received an individual score per leadership factor.

Changes in student achievement on the FSA ELA/Reading component and the Algebra 1 EOC examination were calculated by subtracting the overall 2016 scores on both assessments from the 2017 overall scores on both assessments. Achievement refers to any student that received a Level 3 or higher on 5-point scale. Changes in achievement data were calculated for the schools identified by principals as their current work locations (n = 14). The changes in student achievement data on the FSA ELA / Reading Component and the Algebra 1 EOC from school year 2015-2016 to 2016 and 2017 are presented in Tables 2 and 3.

Table 2

Difference in Overall Florida Standards Assessment English Language Arts/Reading Achievement by Principal (n=14)

Principal	Overall Achievement			
	Total PAS Score (Sum)	2017 (%)	Mean	Standard Deviation
18	106	39	33	6
11	101	25	21	4
3	101	65	62	3
17	90	56	53	3
39	103	46	43	3
7	103	49	49	0
12	90	63	63	0
34	109	30	31	-1
14	100	43	46	-3
15	85	61	64	-3
16	91	69	72	-3
36	103	40	43	-3
4	105	32	36	-4
13	88	25	29	-4

Note: Maximum PAS Score=110

Table 3

Percentage Difference in Overall Algebra 1 End of Course Examination Achievement by Principal (n=14)

Principal	Overall Achievement			Percentage Difference
	Total PAS Score	2017 (%)	2016 (%)	
36	103	37	28	9
39	103	43	36	7
11	101	18	17	1
12	90	50	51	-1
4	105	19	23	-4
13	88	17	21	-4
3	101	46	51	-5
17	90	36	41	-5
34	109	31	37	-6
14	100	20	27	-7
16	91	53	60	-7
18	106	18	25	-7
7	103	25	35	-10
15	85	39	51	-12

Note: Maximum PAS Score=110

A Pearson r correlation was utilized to investigate the possibility of a relationship between PAS scores and the changes in student achievement on the FSA ELA/Reading Component and the Algebra 1 EOC examination for the school years 2017 and 2016. The Pearson r correlation results determined that there was a statistically significant correlation among principal mean scores on the PAS and changes in student achievement on the FSA ELA/Reading component ($r = -.35$, $n = 14$, $p = .219$) and the Algebra 1 EOC ($r = -.187$, $n = 14$, $p = .182$). Table 26 presents the results of the statistical analysis for principal mean scores on the PAS and differences in student achievement level on the FSA ELA/Reading Component and the Algebra 1 EOC.

Table 4

Pearson r Correlation Between Principal Actions Survey (PAS) Scores, FSA ELA/Reading Component, and Algebra 1 End of Course (EOC) Results (n=14)

Correlation	PAS Mean	FSA ELA/Reading	Algebra 1 EOC
Pearson Correlation	1	-.350	-.187
Sig. (2-tailed)		.219	.522
N	14	14	14
Pearson Correlation	-.350	1	.378
Sig. (2-tailed)	.219	0	.182
N	14	14	14
Pearson Correlation	-.187	.378	1
Sig. (2-tailed)	.522	.182	0
N	14	14	14

Research Question 3

How do reported second-order change leadership behaviors of high school principals compare with the findings of elementary school principals reported by La Cava (2009) and Kearney (2012) on the Principal Actions Survey (PAS)?

Research Question 3 was answered by using a one-sample t-test to compare the overall PAS means of elementary principals in schools with more than 60% poverty, as determined by La Cava (2009), and also using a one-sample t-test to compare the PAS scores of elementary principals in schools with less than 60% poverty, as determined by Kearney (2012), to the current study.

In order to find the overall mean score of the findings presented by La Cava (2009), the researcher used the total scores of responses presented by La Cava (2009) divided by the total number of PAS items. The result of the computation was a mean value of 4.63 for principals in schools with 60% or more poverty. The researcher ran a one-sample t-test to compare the findings to the current research. According to the analysis, there was no statistical difference between scores of high school principals ($M=4.48$, $SD=.34$) and elementary principals in schools with more than 60% poverty ($t(13) = -1.68$, $p = .12$). However, there is a slight difference in the scores of elementary and high school principals' means on the PAS of $-.15$.

Table 5

Results of One-sample t-test: Elementary School Principals With 60% or More Poverty and High School Principals

t	Df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
				Lower	Upper
-1.68	13	.12	-.15	-.35	.04

To compare the overall PAS score of elementary principals studied by Kearney (2012) to the current study, the scores were recalculated from a 4-point Likert type scale without a neutral response option to a 5-point Likert type scale with a neutral response type. After recalculation, the results of the computation yielded a mean of 4.48 for elementary principals at a school with a less than 60% poverty level. The researcher ran a one-sample t-test to compare the findings to those in the current research. According to the analysis, there was no statistically significant difference between the mean scores of high school principals ($M = 4.48$) and elementary principals ($M = 4.48$) in schools with less than 60% poverty $t(13) = -.031, p = .98$. However, there is a slight difference among elementary school principals in schools with a poverty level of less than 60% and high school principals of .003.

Table 5

Results of One-Sample T-test for Elementary School Principals with Less Than 60% Poverty and High School Principals

T	Df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
				Lower	Upper
-.031	13	.95	.003	-.20	.19

Research Question 4

According to high school administrators, what leadership behaviors have the most influence on changes in academic student achievement?

A total of 50 responses from a total sample of 69 administrators were included in the thematic analysis of survey item 6, and three promi-

nent themes emerged related to administrators' actions and behaviors to make changes at their schools. To be a theme, there had to be at least 10 administrators who responded to this item. The three themes identified in the analysis related to survey item 6 were: (a) professional learning, (b) professional learning communities (PLCs), and (c) monitoring. Tables 36, 37, and 38 contain the administrator responses identified in the analysis for the three identified themes.

Professional Learning

Professional learning was cited by 17 of the high school administrators in their open-ended responses on the PAS. Responses were specific to job-embedded professional learning used for the purpose of increasing expertise of instructional practice to increase student achievement and book studies to promote change. In discussing job-embedded professional learning, AP1 wrote, "Planned and organized professional development to assist teachers in expanding their knowledge and expertise in instructional strategies." AP 18 wrote, "I have been largely responsible for planning and implementing professional development training sessions, targeting research-based practices, and standards-based instruction." AP 24 wrote, "...offered opportunities for teachers to shadow one another and provide mentoring...." In discussing professional learning using book studies, AP2 wrote, "We conducted book studies on the growth mindset and blended learning to help build teacher capacity." Additionally, AP 24 wrote, "I have led book studies...for new teachers."

Professional Learning Communities

Professional learning communities (PLCs) were mentioned by 15 high school administrators. Responses were specific to the implementation, structures for analyzing student data outcomes, and monitoring for effectiveness of structures through PLCs. In discussing the implementation of PLCs, one respondent (P9) wrote, "Implemented common planning times for PLCs and set up structures for more efficient operations." In discussing the use of PLCs to analyze data outcomes, another respondent (AP5) wrote, "I have assisted in creating high functioning PLC teams that use data to drive their instruction..." AP 11 wrote, "Teachers have been taught data analysis through their PLC in order to drive instruction based on their student data." In discussing monitoring for the effectiveness of PLCs, AP16 wrote, "Attending regular PLC meetings to observe the process of collaboration among teachers to see how it will affect instruction." AP20 observed, "Being more hands-on in PLCs and guiding planning and instructional strategies and monitoring for consistent implementation in the classroom to ensure that standards and skills are being taught and understood at the appropriate level of rigor." Respondents reported the

utilization of PLCs as a means of analyzing data and incorporating strategies for the implementation of standards-based instruction and instructional strategies.

Monitoring and Evaluating

Eleven high school administrators indicated their actions and behaviors in monitoring and evaluating resulted in changes to practice at their schools. Responses were specific to monitoring the effectiveness of instructional strategies, transfer of knowledge, and student data outcomes. In discussing the effectiveness of instructional strategies, AP18 wrote, “I always provide very actionable feedback to teachers through the clinical observation cycle, coaching observations, walk-throughs, informal observations, and formal observations.” AP21 wrote, “...monitor teacher skill acquisition for new teachers.” In discussing data outcomes, A6 wrote that administrators incorporated “structured planning and data analysis with a remediation plan built from the results.” AP29 wrote, “I monitor and identify data trends to drive rigorous instruction.”

Creating a Culture of Change

Twenty-two respondents provided responses related to creating a culture of change, making it the prominent theme in the thematic analysis of survey item 7. The subthemes identified after analysis of responses were resistance, growth mindset, and changes in traditional practices. In discussing resistance, AP5 wrote, “Teachers are resistant to change due to being uncomfortable with a new approach to teaching.” AP34 stated “The greatest challenge I encounter is requesting staff to change instructional practices that have been in place for a long time.” In discussing implementing a growth mindset, AP31 wrote, “Challenges are encountered by those with fixed mindsets.” P18 wrote, “The greatest challenge is shifting the mindset of teachers who strongly believe that change is not needed.” In discussing change related to tradition, AP19 wrote, “The school I work at is extremely entrenched in tradition which is a good thing generally. The downside to the history of tradition is that it can sometimes be difficult to make changes.”

Discussion

Systems of accountability within the educational sector require school-based administrators to deviate from traditional norms to impact student achievement through various approaches to strategic and sustainable instructional leadership. Specifically, second-order change encourages the implementation of seven leadership factors to increase student achievement outcomes. Three prior studies (LaCava, 2009; Taylor, 2012a;

Kearney, 2012), conducted in elementary schools, confirmed the ways in which second-order change increases student achievement and the role of each leadership factor in that process. This study investigated the relationship between second-order change leadership behaviors of high school administrators and student achievement outcomes. Though the sample of administrators in the aforementioned studies were elementary school principals, current findings were in alignment with incorporation of the seven leadership factors of high school administrators.

It is important to point out the similarities and differences between the principal and assistant principal study groups. Specific to this study, scores of the principal group and the assistant principal group on the Principal Actions Survey varied depending upon the leadership factor. Principals scored higher overall means than assistant principals in the areas of knowledge of curriculum, instruction, and assessment, optimizer, change agent, and monitoring/evaluation. However, assistant principals scored higher overall means in the areas of intellectual stimulation, flexibility, and ideals/ beliefs. The greatest difference among mean scores (-4.53) was the leadership factor optimizer which is “being the driving force behind the new innovation and fostering the belief that it can produce exceptional results if members of that staff are willing to apply themselves.” (Marzano, Waters, & McNulty, 2005, p. 72). Based on each leadership factor, such change may be due, in part, to the distinct roles and responsibilities of principals and assistant principals. Flexibility had the lowest mean score between both groups. It may be concluded that accountability, such as state and district mandates, may hinder flexibility.

The researcher set out to determine the correlation between principals’ scores on the PAS and student achievement. The analysis indicated that there was a statistically significant difference between principals’ scores on the PAS and student achievement, as evidenced by the Florida Standards Assessment ELA/Reading component ($r = -.35$, $n = 14$, $p = .219$) and the Algebra 1 EOC ($r = -.19$, $n = 14$, $p = .522$). Principals were placed into three tiers in order of overall PAS score. Although Tier One principals ($n = 5$) reported the highest overall scores on the PAS, tier two principals ($n = 5$) had the highest collective gains in student achievement on the FSA ELA/Reading component and the Algebra 1 EOC. Tier Three principals decreased in student achievement outcomes on the Algebra 1 EOC, while one principal in this tier had the greatest decline (-12) in student achievement on the FSA ELA/Reading component. Changes in student achievement were not necessarily contingent upon years of administrative experience, age, or the earned degree.

Four action themes emerged as a result of qualitative analysis: professional learning, professional learning communities, monitoring/evaluating, and creating a culture a change. As such, the developed action themes may be important in implementing school turnaround efforts. The researcher determined the intersectionality among the developed action

themes and the seven leadership factors. The analysis of themes across the seven leadership factors presents the importance of knowledge of curriculum, instruction, and assessment, alignment of standards, curriculum and instruction, and collaboration manifested as leadership behaviors were themes that participants stated contributed to the successful implementation of second-order change. While the thematic analysis presented professional learning as a contributing factor in leading change, it was only evident for the leadership factors of knowledge of curriculum, instruction, and assessment and intellectual stimulation.

Conclusion

Instructional leadership serves as one of the factors that aids in the success of school leadership and the improved student achievement in the current era of accountability. Second-order change, as outlined by Marzano, et al. (2005), encompasses the seven leadership factors that contribute to effective instructional leadership practices. However, as the roles and demands of school-based administrators change, it is important to place emphasis on and strategically take approaches to implement and sustain the following: professional learning opportunities, professional learning communities, monitoring and evaluating, and creating a culture of change.

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Eugene Pringle is an assistant professor at Bethune-Cookman University.

A COST-BENEFIT ANALYSIS OF A TEEN PREGNANCY PROGRAM EMPLOYED AS A HIGH SCHOOL DROPOUT INTERVENTION

The purpose of this study was to evaluate a state-wide teen pregnancy dropout prevention program using cost-benefit analysis. Data analyzed from five high schools covering a decade compared three student populations: teens from the general population, teens who were enrolled in the fully online program, and teens who selected out of the full program but made use of daycare services. Graduation outcomes and the cost per student for administering each version of the program were examined. Results revealed that students in the full program (over the 10 years) experienced a graduation rate of 1.6% with a negative rate of return of \$-8,989,736; whereas, student continuing their face-to-face courses (but making use of daycare services) experienced a graduation rate of 64.5% and rate of return of \$293,370. These findings demonstrate the utility of employing a cost-benefit analysis, encouraging school districts to collect more data regarding educational outcomes of pregnant and parenting teenagers to guide the efficient allocation of resources. This methodology could be adopted to inform future policy decisions aimed at increasing high school graduation rates while judiciously evaluating the investment for those interventions.

Introduction

For decades, failure to complete high school has been recognized as a social and economic problem in the United States. Dropping out of school accounts for long-term negative social and economic effects for the dropouts themselves and society. Dropouts report a variety of reasons as to why they leave school early, but these reasons do not often identify the underlying causes of dropout behavior. It is difficult to attribute any single factor as the cause of dropout behavior (Bowden & Belfield, 2015).

Identifying students with risk factors early in their academic careers and providing them with ongoing support, remediation, and counseling are likely to be the most promising means of encouraging them to remain in school. It is possible to identify the factors more closely related to dropping out. Home, life, and socioeconomic status are closely linked with dropout behavior. Ongoing absenteeism, poor grades, grade retention, school climate, practices, and resources may also affect dropout behavior (Beatty, 2001).

Warning signs for students at risk of dropping out often appear in

elementary school with many interacting school-related, home life, and socioeconomic factors that lead to the process of dropping out (Rumberger, 2011; Beatty, 2001). The proportion of students who are racial, ethnic, and linguistic minorities and whose families' incomes are in the lowest 20 percent of the population are more likely to drop out than students now in the highest 20 percent of the population. An increased risk in academic difficulty can also be seen in students of single-parent families, those from large families, and those who become parents themselves (Beatty, 2001).

Within the complexity of at-risk factors that ultimately leads to dropping out of school, there is typically one final event that leads youth down the pathway to dropping out of school. Identified tipping points that lead to dropping out that have been described as: serious academic failure, expulsion and suspension, bullying, housing instability or homelessness, health issues, pregnancy, and gang membership or delinquent activity. The 'tipping point' is representative of a culmination of multiple unaddressed academic, behavioral, peer, and personal issues. A pregnancy, itself, is typically representative of the final dropout act following a lengthy history of academic and social problems as pregnancy may have expedited the way out from an already adverse situation (Feldman, et al., 2017).

After forty years of research, the effect of teenage childbearing on educational attainment is still unclear, and there is a presumed negative effect on the rate of graduation that results from teenage childbearing (Kane, 2013). Many of the earlier studies suggested that the teenagers who became pregnant were not doing well before their pregnancy occurred as they were more likely to come from disadvantaged backgrounds, experienced problems in school, and had lower expectations of going to college than their peers (Furstenberg, 2003).

A review of the research suggests that the dropout process may be greatly accelerated by teenage pregnancy for a student who already exhibits one or more of the at-risk factors of drop out behavior prior to such events. Research has documented that academic failure is typically experienced by young women before becoming pregnant, and pregnancy was often the catalyst for dropout behavior (Feldman et al., 2017). It is also more likely that social and economic factors that a teenage mother experiences lead to poor outcomes compared to the experience of early childbearing (Hotz, et. al., 1999).

Rapid departures from school are often associated with expulsion, homelessness, bullying, and pregnancy. These accelerated leavers drop-out within such a shortened time frame that intervention opportunities are difficult if not impossible to implement. Pregnancy has been consistently identified as one tipping point that leads young women to a rapid departure from school. The dropout problem matters because high school diplomas have served as credentials for labor markets and colleges. Understanding risk factors and identifying and implementing effective practices and policies that reduce the dropout rates remain a critical issue for the nation

(Feldman, et al., 2017).

Pregnancy and Specific Dropout Behavior

The idea that teen childbearing elicits the poor socioeconomic outcomes that teen mothers face implies that the young mother already had developed the skills and knowledge required to compete in the labor market. The adverse outcomes attributed to teenage childbearing may simply reflect preexisting differences in family background, such as poverty and other factors that make teen mothers different from women who delay childbearing. These adverse outcomes may have little to do with the timing of motherhood (Hoffman, 2012).

Hotz, McElroy, and Sanders determined the counterfactual conditions of an adolescent mother's economic outcomes if she had not had a child as a teen. They compared the outcomes of women who became pregnant and experienced a miscarriage as teenagers to women who became pregnant as teenagers. Through this natural (in vivo) experiment, researchers obtained comparison groups from which they derived estimates of counterfactual outcomes for teenage mothers. These researchers found that the negative consequences of teenage childbearing were much smaller than indicated in previous studies and that the consequences of early childbearing were short-lived. This experiment raised doubts about teenage childbearing as a social problem in the United States (Holtz, et al., 1999). Most studies have indicated a negative effect of becoming a teenage parent on educational outcomes (Mollborn, 2010). The proportion of students who are racial, ethnic, and linguistic minorities, who come from poor families, and who live in single-parent households, are factors that research has shown to be associated with school failure and dropping out and, as such, are increasing in the nation's schools (Rumberger, 2011).

Cost Benefit Analyses in Education

With respect to a cost-benefit approach, it is clear that completing high school results in substantial benefits to taxpayers over time. The benefits can be seen as increases in federal, state, and local tax revenues, increases in contributions to social support and insurance programs, reductions in public expenditures on social support and insurance programs, and reductions in public expenditures on the criminal justice system (Carroll, et. al., 2009).

While educational spending has increased, historically, little attention has been given to the cost and productivity of education and how education may be improved relative to the costs (Levin, 1988). Typically, more time and attention has been devoted to educational program effectiveness rather than to the costs of achieving this effectiveness. Cost analysis in research promotes the use of interventions in consideration of the

resources required to implement them. It is necessary to determine which methods are most efficient at increasing the rate of high school completion (Hollands, et al., 2013).

Policymakers allocate a significant amount of resources to efforts to prevent teenage childbearing (Kane, 2013). However, less funding is allocated for tracing pregnant and parenting student academic outcomes (Pillow, 2006). This study examined the graduation outcomes of pregnant and parenting students in the selected Florida school district data and the rate of graduation achieved through teenage parenting academic program interventions.

About the Teenage Parenting Program

The Teenage Parenting Program (TAP) was a voluntary program designed to provide comprehensive and ancillary services to facilitate coursework completion necessary to earn a high school diploma. Each school district in the state of Florida maintains a TAP for pregnant and parenting students and their children. The program provided the option to participate in a tailored online program that included daycare (i.e., the full program) or regular classroom activities with included daycare (i.e., day-care only). The established and defined goals of the Teenage Parent Programs were as follows:

- Support the health and well-being of the teenage mother, father, and their infant, both physically and psychologically;
- Prevent pregnancy among teenagers and avoid subsequent births;
- Provide alternative academic arrangements to assist teen mothers in completing school;
- Provide counseling assistance or case management services; and
- Teach teen parents strategies for caring for themselves and parenting skills for the care of their child(ren) (Teenage Parenting Program, 2017).

The costs of caring for the children of teenage students were based on the accounting report of the selected Florida school district of this study. In addition to the regular academic program, the TAP program provided four additional ancillary services for pregnant and parenting students and their children that included childcare, health services, social services, and transportation. These services were provided during the hours when the child's teenage parent was in school. For funding purposes, Florida school districts reported the children of participants and completers for full-time equivalent student membership in the Florida Education Finance Program, when the district met certain conditions. Child care health services including prenatal and postnatal health checkups, health and nutrition education, routine physicals and checkups, and immunizations for teenage parents

and their children coordinated during the time that the teenage parent-student reported for FTE in the teenage parent program (FRS, Sec. 003.54).

Children enrolled in child care provided by the district were funded at the special program cost factor while their parent was enrolled full time in the Florida public school district (Senate, 2018). Provided that the child of a TAP student had not attained the age of five or was eligible for kindergarten, the child of a TAP student continued to receive childcare services until the parent graduated or withdrew from the TAP program.

Transportation service was provided for pregnant and parenting students who were enrolled in the TAP program or for TAP program completers who have returned to their home schools and their children. Provision of this service required transportation for teenage parents and their children to and from home and the childcare facility and the school as required for the parent's educational activities during credit-earning hours, regardless of distance (FRS, Sec. 003.54).

Students enrolled in the TAP intervention program often shared defined risk factors such as lower socioeconomic status, limited English proficiency, exceptional student education (ESE) status, previous grade retention, and rates of poor academic progression. While their parenting status was the sole qualifier for the intervention, students who received the TAP interventions exhibited an assortment of at-risk factors that have been identified as precursors to dropout behavior. Data from the TAP program included ESE status, English language learner (ELL) status, low socio-economic (SES) status as determined by participation in the free and reduced school lunch program and graduation outcome status were included in the analyses.

Research Questions

This study examined a dropout prevention education intervention strategy designed to meet the needs of pregnant and parenting teenagers and to provide a cost-benefit analysis. Specifically, the study compared the graduation outcomes of the program provided in two formats (i.e., full online-program with daycare provisions and daycare provisions only) to the graduation outcomes of a traditional high school program. This study weighed each program format intervention cost against the outcomes and the best intervention approach was considered (Levin, et al., 2018). In addition, this study evaluated the economic consequences of students who dropped out of the public school program and the public savings or societal benefits of each high school graduate of each intervention format.

Research question one: How did the graduation outcomes for students enrolled in the full TAP academic and daycare service intervention (treatment one) compare with the graduation outcomes of students enrolled in the TAP daycare-only service intervention with an academic program in a traditional high school setting (treatment two)?

Research question two: Which intervention approach is the most

cost-effective in achieving higher rates of graduation?

Research question three: For each intervention approach, what is the cost per high school graduate?

Research question four: What public savings occur with each program intervention graduate when compared with the program intervention public cost?

This study examined the allocation of resources to a TAP as applied to achieve the program's goal of an increased rate of graduation. This study also examined the graduation rates of students of pregnant and parenting teenagers to determine which educational programming is most effective and efficient in achieving the graduation outcomes for pregnant and parenting teenagers.

Fiscal Context

Using the latest available audited financial statements, the 2016-2017 financial report of the selected Florida school district, the average school enrollment cost of a typical student was \$7,784. Based on this 2016-2017 enrollment cost, the total cost of public school education from kindergarten to twelfth grade was \$101,192. In 2017-2018, the graduation rate in the state of Florida was 86.1 percent. In 2017-2018, the rate of graduation in the state of Florida was 89 percent for whites, 85.1 percent for LatinX students, and 80.9 percent for Blacks. Florida students from non-economically disadvantaged households experienced a graduation rate of 90.9 percent in 2017-2018 while Florida students from economically disadvantaged households experienced a graduation rate of 82 percent in 2017-2018. "Non-at-risk" Florida students graduated at a rate of 90.3 percent in 2017-2018 while "at-risk students" in Florida graduate at a lower rate of 72.7 percent in 2017-2018 (Education Attainment, 2017).

From a public and social cost perspective, an extensive body of research literature has established that poor education contributes to significant costs in the form of lower-income and economic growth, reduced tax revenues, and higher costs of public services such as health care, criminal justice, and public assistance. Levin has identified seven social consequences of inadequate education, which he defined as the failure to complete high school.

- Forgone national income.
- Forgone tax revenues for the support of government services.
- Increased demand for social service.
- Increased crime.
- Reduced political participation.
- Reduced intergenerational mobility.
- Poorer levels of health. (Levin, 1972).

Research Methodology

This study examined three populations of female students enrolled in a selected large Florida public school district between 2006 and 2016, inclusively. Treatment one consisted of 246 typically-enrolled students that received the full TAP academic and TAP daycare intervention treatment. Treatment two consisted of 35 typically-enrolled students who received TAP daycare-only and TAP parenting class-only services while in a traditional high school academic program, and control group which consisted of 10,184 typically-enrolled high school students in one of five regular district high schools. The five area high schools were selected as the control group for this study given that these schools were the zoned home schools of the students who received the TAP intervention. Members of the control group provided a baseline estimate of what the treatment group would have attained in the absence of the treatment.

All collected data remained anonymous and each student's district-assigned number was replaced with a randomly assigned number. The researchers examined the costs of the TAP as well as the costs of the regular education high school program with accounting data provided by the district.

A cost analysis was conducted to compare the monetary estimates of the cost-benefits of the TAP program. A cost-benefit analysis determined whether the benefits of given alternative outweighed the costs of providing it. The program and its alternatives were compared to determine which program provided the greatest amount of benefit relative to its cost (Levin, et al., 2018). The cost-benefit ratio provided a simple indicator of whether the benefits outweighed the costs and were interpreted as the number of monetary units of benefit for each unit of costs. The benefits for the taxpayer as well as for program participants were calculated.

This analysis controlled for pregnancy and parenting variables. It was anticipated that even after establishing these controls, the TAP improved educational outcomes for pregnant and parenting students.

The researchers used graduation data from 2006-2016 from five high schools in the selected Florida school district that served as the original home schools of the females who received the intervention. Data were analyzed and characterized by student demographic information that included female gender, socioeconomic status as determined by the percentage of students who received free or reduced-cost lunch, race, ESE status, ELL status, and graduation outcome status. Participation in the school lunch program determined the incidence of economic need among students in this program as they had come from families at or below 130 percent of the poverty level and eligible for free meals. Students from families with an annual income between 130 percent and 185 percent of the poverty level were eligible to receive meals at a reduced price. Participation in the free and reduced lunch program determined the socio-economic

status of the students in this study (Hotz, et al., 1999).

The first research question explored the graduation outcomes for students enrolled in the TAP academic and daycare intervention compared with the graduation outcomes of students enrolled in the TAP daycare-only intervention and an academic education program in a traditional high school setting. This question required a control group that tested the TAP intervention groups. Binary logistic analyses were performed to investigate which of the demographic factors predicted the successful graduation outcomes for the female students in the three study groups; treatment one group, treatment two group, and the control group. Demographic factors consisted of ELL status, ESE status, SES status, race defined as Black, white, or LatinX, and graduation outcomes.

The dataset used in this study contained 10,465 cases. Of the 10,465 cases, 10,184 females (97.3 percent) were in the control group and enrolled in the traditional high school academic program. There were 246 females (2.4 percent) who were in the treatment one group and enrolled in the teenage parenting academic intervention program (TAP) with their children enrolled in the TAP daycare. The treatment two group consisted of 35 females (0.3 percent) enrolled in a traditional high school academic program and their children were enrolled in the TAP daycare intervention service.

The demographic characteristics of each study group are presented in Table 1. There were significant differences among the three study groups on all variables, except ESE status. Specifically, the treatment two group had a smaller percentage of white females, a larger percentage of females eligible for free and reduced lunch, and more females with ELL status compared to the other two groups. As for the variable of interest, the graduation rate is significantly smaller in the treatment one group compared to the control and treatment two groups.

Binary logistic regression analyses were performed to investigate which of the demographic factors contributed to the chances of graduation for the females in the three study groups. The first analysis included the main effects of the demographic variables as well as the interactions with the study group to investigate whether demographics had different effects in each group. All nonsignificant interactions were eliminated in the final model.

The final regression model had a good fit with these data, $X^2(9) = 1508.02$, $p < .001$, Nagelkerke $R^2 = .21$. The model correctly predicted 80.9 percent of the cases in the sample, which is a 2.4 percent difference compared to the null models without any explanatory variable. The regression coefficients for the final model are presented in Table 2.

Table 1

Demographics of Study Groups

Variable	Group						Chi-square test of independence
	Control		Treatment two		Treatment two		
	Count	% within group	Count	% within group	Count	% within group	
Race							56.25***
Black	1733	17.0	37	15.0	10	28.6	
LatinX	4680	46.0	163	66.3	22	62.9	
White	3771	37.0	46	18.7	3	8.6	
ESE status	1414	13.9	35	14.2	3	8.6	85
Free lunch	5073	49.8	143	58.1	19	61.3	8.23*
ELL status	1639	16.1	53	21.5	14	40.0	19.69***
Graduation	8190	80.4	4	1.6	20	64.5	887.40***

* sig. .05

** sig. at .01

*** sig. at .001

Table 2

Regression Coefficients for Binary Logistic Regression

Variable	B	SE	OR	95% CI for OR	
				Lower	Upper
Black	-0.37***	0.09	0.69	0.58	0.82
LatinX	-0.43***	0.07	0.65	0.56	0.74
Treatment 1	-6.98***	1.00	0.00	0.00	0.01
Treatment 2	-0.79	0.42	0.45	0.20	1.04
ESE status	-0.89	0.07	0.41	0.36	0.47
Free lunch	0.02	0.06	1.02	0.91	1.15
ELL status	-1.42***	0.06	0.24	0.21	0.27
ESE status by treatment 1 group	3.71***	1.17	40.67	4.07	406.03
ESE status by treatment 2 group	1.15	1.36	3.15	0.22	45.05
Constant	2.14	0.05	8.52		

Results

Research question one: How did the graduation outcomes for students enrolled in the full TAP academic and daycare service intervention (treatment one) compare with the graduation outcomes of students enrolled in the TAP daycare-only service intervention with an academic program in a traditional high school setting (treatment two)?

Of all three study groups, Black and LatinX females were less likely to graduate compared to white females. Specifically, of all three study groups, black females had a 45 percent less chance to graduate and LatinX females had a 54 percent less chance to graduate. Similarly, females with ESE and ELL status were less likely to graduate compared to females without these conditions. However, the effect of ESE status varied across the three study groups. In the control group, the females with ESE status were 2.4 times less likely to graduate, and in treatment two group the chances to graduate for these females were similar. However, in the treatment one group, successful graduation outcomes for the females with ESE status were 16.7 times higher than for the females without this status. This result should be considered with caution, as in the treatment one group the graduation rate was very small and only one female without the ESE status had graduated, while three females with this status had graduated. ELL females had four times less a chance to graduate compared to non-ELL females.

Finally, the females in treatment one group graduated at a significantly lower rate compared to the females in the control group. There was no difference in the graduation rate between the control and treatment two group. Therefore, it is concluded that treatment two program was effective in increasing the graduation rate of at-risk females.

Research question two: Which intervention approach is the most cost-effective in achieving higher rates of graduation?

Based on the graduation outcomes of treatment one and treatment two, the intervention approach that was considered the most cost-effective was treatment two with a graduation rate of 64.5 percent between 2006 and 2016. The graduation rate of treatment one was 1.6 percent between 2006 and 2016. Using the treatment cost of \$18,886 for each typical female student and \$18,886 for her child, the total cost of the treatment one program between 2006 and 2016 was \$9,291,912 in 2017 dollars. Of the \$9,291,912, it cost \$151,088 for the graduated females and their children in the treatment one group and \$9,140,824 for the non-graduated females and their children in the treatment one group. The cost of graduates from the treatment one group minus the cost of non-graduates from the treatment one group was -\$8,989,736. Between the years 2006 and 2016, the treatment one group experienced a negative rate of return of -\$8,989,736 with a graduation rate of only 1.6 percent.

The graduation rate of treatment two was 64.5 percent between 2006 and 2016. Using the treatment cost of \$18,886 for each student's child enrolled in the intervention and \$7,784 as the cost for each typical

female student enrolled in the traditional high school program, the total cost of the treatment two program between 2006 and 2016 was \$933,450 for both graduates and non-graduates of the treatment. Of this \$933,450, \$613,410 was the cost of the treatment two graduates, and \$320,040 was the cost of the treatment two non-graduates. The cost of graduates from the treatment two program minus the cost of the non-graduates from the treatment two program was \$293,370 with a graduation rate of 64.5 percent.

Research question three: For each intervention approach, what is the cost per high school graduate?

In the 2016-2017 academic year, the cost of a typical student enrolled at one of the district's TAP intervention site one was, \$17,474. The cost of a typical student enrolled in the district's other TAP intervention site was \$20,298. Therefore, the average student cost of the TAP intervention provided by the district to a typical student at each of these intervention sites was \$18,886.

The school district appropriated funds to meet the needs of the program. The federal, state, and local revenues did not cover the full cost program expenditures and costs of the 2017 year. For 2017, the actual funding for one of the two program intervention sites in terms of revenue generated by the specific program was \$207,627 while the expenditures and costs were \$641,397. For 2017, the actual funding for the second of the two program intervention sites in terms of revenue generated by the specific program was \$143,938 while the expenditures and costs were \$533,956. This meant that the school district subsidized the intervention program through other revenue sources.

The 2016-2017 typical student cost of enrollment for the control group consisted of the enrollment costs for the five district high schools used in this study that served as the home-schools of TAP students for graduation reporting purposes. The costs of a typical student enrolled in each of the five district high schools were as follows: \$8,097; \$7,568; \$7,749; \$7,707; and \$8,316. Therefore, the average cost of a typical student enrolled in a traditional high school in the selected school district was \$7,784.

The difference in the average cost of typical student enrollment for the treatment group and the average cost of typical student enrollment in the control group was $\$18,886 - \$7,784 = \$10,998.60$. It costs an additional \$10,998.60 for the treatment program per typical student enrolled compared to the cost of the standard high school program per typical student enrolled.

In a program cost comparison, the treatment one group consisted of typical female students enrolled in the teenage parent academic program and their children enrolled in the teenage parent program (TAP) day-care. There was not an enrollment cost differentiation between the student mother and her child in the TAP treatment program.¹ The cost per female student was \$18,886 and her child enrolled was \$18,886.

The treatment two group consisted of typical female students enrolled in a traditional high school academic program and their children enrolled in the teenage parent program daycare. The cost for a typical student enrolled in a traditional high school was \$7,784 and the cost of her child enrolled in the TAP daycare program was \$18,886.

The control group consisted of typical female students enrolled in any one of the five district high schools that were considered home schools to the students served by the intervention. The average cost of a typical female student in any one of the five district high schools was \$7,784 and represented the control group of this study.

The cost of the treatment one program for the typical female student and her child was \$18,886 each or $\$18,886 \times 2$ which equaled \$37,772 in 2017. The treatment one group experienced an overall graduation rate of 1.6 percent and was more expensive to implement than the treatment two intervention.

The treatment two intervention costs consisted of the traditional high school program for the typical female student plus daycare for her child enrolled in the TAP intervention. The cost of a typical student enrolled in the traditional high school program represented the baseline education cost of \$7,784 plus the cost of daycare for her child at \$18,886 equaled \$26,670 in 2017. Overall, this treatment two group experienced a significantly higher rate of graduation at 64.5 percent and at a lower cost than that of the treatment one group.

The treatment one intervention consisted of typical female students who received full-time TAP academic intervention services with their children enrolled in the TAP daycare at a cost of \$37,772 or \$18,886 for the female student and \$18,886 for the child of the female student. The baseline cost of a typical female student in the traditional program was \$7,784. The implementation cost of the treatment one program at \$37,772 minus the baseline cost of a typical female student in the traditional program of \$7,784 equaled \$29,988. This figure represented the cost of the intervention per female student and child in the treatment one group.

The cost to implement treatment two was \$26,670. This figure included the cost of the typical female student in the traditional high school program at \$7,784 plus the cost of the TAP intervention daycare service provided to the student's child at \$18,886. The implementation cost of the treatment two program at \$26,670 minus the baseline cost of a typical female student in the traditional program at \$7,784 equaled \$18,886; the cost of the treatment two intervention per female student and child.

The control group consisted of typical female students enrolled in the traditional high school program between 2006 and 2016. Treatment one consisted of typical female students who received full time TAP academic intervention services with their children enrolled in the TAP daycare between 2006 and 2016. Treatment two consisted of typical female students who received the traditional high school academic program while

only their children received the TAP daycare intervention between 2006 and 2016. The control group experienced the highest rate of graduation at 80.4 percent while treatment one experienced the lowest rate of graduation at 1.6 percent. The treatment two group experienced a graduation rate of 64.5 percent.

Treatment one was the most expensive intervention to implement at a cost of \$29,988 with a significantly low rate of graduation of 1.6 percent. The implementation cost of treatment two was \$18,886 with a higher graduation rate of 64.5 percent. The control group represented the cost of a typical female student in a traditional high school program. This group experienced a rate of graduation of 80.4 percent at the baseline cost of \$7,784.

Of 10,184 female students in the control group between 2006 and 2016, 8,188 female students graduated from high school, and 1,996 female students did not graduate from high school. Of the 246 female students enrolled in the treatment one group between 2006 and 2016, 4 female students graduated from high school and 242 female students did not graduate from high school. Of the thirty-five female students enrolled in the treatment two group between 2006 and 2016, twenty-three female students graduated with a standard high school diploma and twelve female students did not graduate from high school. The 2017 lifetime total social benefit per Florida female by education level is a gain of \$283,535 for a high school graduate over a high school dropout (see table 3).

Research question four: What public savings occur with each program intervention graduate when compared with the program intervention public cost?

Society experienced a 1.76 billion-dollar gain in social benefits as represented by earnings, health savings, crime savings, welfare savings, and productivity gains, with the control group of this study. Society experienced a total lifetime loss of 67.5 million dollars in social benefits as represented by earnings, health savings, crime savings, welfare savings, and productivity gains, with the treatment one group of this study. Society experienced a 3.1 million dollar gain in social benefits as represented by earnings, health savings, crime savings, welfare savings, and productivity gains with the treatment two group. For all three groups, the lifetime social benefit loss per person for the total number of non-graduates was subtracted from lifetime benefit gains per person for the total number of high school graduates to determine the overall public benefits that occurred with each of the three groups in this study.

Earnings and Benefits by Educational Attainment

In the state of Florida, the total lifetime social benefits per female high school graduate was a total gain of \$283,535 over a female student with no high school diploma. (see table 3).

Table 3

Lifetime Total Social Benefits per Person by Education Level (Present Value at Age 18)

	Difference over HS dropout					
	Female		Male		Average	
	HS graduate	Expected HS graduate	HS graduate	Expected HS graduate	HS graduate	Expected HS graduate
College costs	\$-	(\$25,978)	\$-	(\$23,434)	\$-	(\$24,706)
Earnings	\$205,515	\$309,587	\$234,284	\$381,236	\$219,905	\$345,417
Health savings	\$45,693	\$61,851	\$31,831	\$42,642	\$38,762	\$52,246
Crime savings	\$12,838	\$14,573	\$186,414	\$201,623	\$99,631	\$108,104
Welfare savings	\$1,574	\$2,328	\$959	\$1,358	\$1,272	\$1,842
Productivity gains	\$12,331	\$18,572	\$14,067	\$22,873	\$13,204	\$20,729
METB savings	\$5,584	\$6,123	\$11,447	\$11,857	\$8,516	\$8,990
Total gains over HS dropout	\$283,535	\$386,056	\$479,002	\$638,155	\$381,290	\$512,623

Source: Clive R. Belfield, "The Economic Burden of High School Dropouts and School Suspensions in Florida," EScholarship, University of California, December 10, 2016 accessed January 28, 2019, <https://escholarship.org/uc/item/8cj0n19m>.

Discussion

There are recommended strategies that may be implemented to support pregnant and parenting students to stay in school. The availability of daycare to parenting students remains a crucial factor in supporting the mother’s decision to remain in school (Clewel, et. al., (1989). The daycare models in the TAPs increased the likelihood that teenage mothers remained in school and as such, treatment two experienced a higher graduation rate of 64.5 percent. Thus, this research supports Clewell and others regarding these programs.

A daycare center at a high school may help young mothers to stay in school, but it is also a public service with a potential constituency in-

dependent of the justification that it prevents dropping out. The existence of the daycare in school not only appeals to a student-mother but also the child's grandparents, neighborhood organizations, and school employees with their children (Dorn, 1996).

The researchers established that the traditional high school academic delivery of treatment two was the more cost-effective intervention that supported a higher rate of graduation among TAP students than did the academic pullout design of the TAP treatment one program. The full pull-out program design of treatment one did not prove beneficial in achieving successful graduation outcomes.

The precise tracking of the graduation outcomes of pregnant and parenting teenagers is imperative to inform the most cost-effective approach in achieving high school graduation. To inform educational policy decisions, cost-effectiveness comparisons of interventions should consistently be incorporated into education program evaluations.

Endnote

- 1 This figure was derived from the total cost of daycare on a per capita cost of daycare figure. The cost of the intervention was a fixed amount and reported by the district to cost \$18,886 per female student and per child enrolled in the TAP intervention.

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Susan Macchia is an assistant principal at the School District of Lee County in Fort Myers, Florida.

David J. Therriault is an associate professor at the University of Florida.

R. Craig Wood is a professor at the University of Florida.

IMPROVING MATH AND SCIENCE INSTRUCTIONAL QUALITY: EVIDENCE FROM A RURAL CONSORTIUM- BASED REFORM INITIATIVE

Rural schools face particular challenges with teacher quality. The Northeast Tennessee College and Career Ready Consortium was a collaborative reform effort among rural schools with a key goal of improving the quality of instruction in math and science to support its efforts to expand academically rigorous courses. This study examines progress made by the Consortium relative to a group of matched comparison schools in improving instructional quality between 2011 and 2014 during the implementation of a federal Investing in Innovation Fund (i3) grant. Based on a difference-in-differences analysis of over 400 classroom observations, we find evidence of broad-based instructional quality gains in the Consortium, particularly among advanced science classes. Although some of the improvement may be attributable to Consortium-specific activities, some improvements may also stem from statewide and nationwide initiatives during this period. We conclude with implications for rural schools in other settings.

Keywords: instructional quality, rural schools, difference-in-differences analysis, classroom observations

Rural schools face particular challenges in ensuring high quality teaching which has important implications given that instructional quality is an important determinant of college readiness. A recent review of rural education studies in Appalachia found that school administrators often have difficulty attracting and retaining high-quality teachers in geographically remote locations, and teachers who are from the region may lack adequate preparation to teach to rigorous standards. Schools often face teacher shortages in STEM-related fields which commonly leads to out-of-field teaching (Kannapel et al., 2015). In addition, maintaining teacher quality is challenging as access to professional development is limited by geographic isolation and lack of necessary staff such as instructional coaches in rural districts (Hansen, 2009; Rude & Brewer, 2003).

Recognizing these challenges, the Northeast Tennessee College and Career Ready Consortium (the Consortium) set a key goal of improving the quality of instruction in math and science to support its efforts to expand academically rigorous courses. Professional development was one of several strategies used by the Consortium to improve college and career readiness in its schools. Other strategies included expanding access to courses through distance and online technology, increasing opportuni-

ties for college-level courses through Advanced Placement (AP) and dual enrollment, and providing a college and career counselors team to promote a college-going culture. The Consortium consisted of a network of 15 neighboring Tennessee cities and counties in rural northeast Tennessee comprising 29 high schools working in partnership with five area colleges. The Consortium's activities were supported by an Investing in Innovation Fund (i3) grant to the Niswonger Foundation between 2010/11 and 2014/15.

According to the theory of change underlying Consortium efforts, the instructional quality of courses students take is an important determinant of students' readiness for college and careers. This theory is backed by research suggesting that instructional quality may be the most important school factor influencing student achievement (Darling-Hammond, 2000; Tharp & Gallimore, 1988). One method commonly used to improve instructional quality is to provide teachers with professional development. Although there is not much conclusive evidence about whether professional development affects student learning and achievement (Jacob et al., 2010; Podgursky et al. 2009), professional development provided to Consortium teachers embodied many research-based best practices.

Our study examines the extent to which math and science teachers who received access to additional professional development in the Consortium strengthened their instructional practices relative to teachers in similar non-Consortium schools. We address the following questions:

- 1) How does the change in average overall instructional quality ratings between baseline and the end of the grant differ between Consortium and comparison schools?
- 2) In which subscales are there gains between baseline and the end of the grant?
- 3) How do these findings vary by course subject and level?

This study contributes to a larger body of literature on the effectiveness of teacher professional development in three important ways. First, it focuses on the effects of professional development in rural high schools which tend to face unique challenges in teacher quality. Previous empirical studies in the literature have focused largely on elementary teachers and urban school contexts (Yoon et al., 2007). Second, this study uses a classroom observation instrument to assess the quality of instruction instead of teachers' self-reported data on changes. Many studies of this type use self-reported teacher data, and prior research has shown that observations tend to provide better data on instruction than surveys or teacher logs (e.g., Porter, 2002). Third, many studies of this type tend to be descriptive in nature which limits the internal validity of the results. This study uses a more rigorous identification strategy with a difference-in-differences design to control for treatment and control-group-level fixed

unobservable.

We begin by describing the professional development provided to Consortium teachers under the i3 grant. Next, we review the literature on attributes of effective professional development and describe how these attributes compare to the professional development provided in the Consortium. Then we provide a study overview and context, followed by a description of the data and methods used for the analysis. We conclude with a discussion of how Consortium activities, along with other state and federal initiatives, may have contributed to improvements in instructional quality as well as implications for rural schools in other settings.

Consortium Professional Development for Teachers

Funding from the i3 grant provided three types of professional development opportunities for Consortium teachers: (1) College Board AP workshops and summer institutes, (2) AP summer professional development academies organized by the Niswonger Foundation, and (3) professional development symposia organized by the Niswonger Foundation. The AP workshops and summer institutes were offered by the College Board, the organization that administers the AP program nationwide. These training opportunities focused on specific AP courses and their prerequisites. Topics included aligning classroom instruction to AP course goals, identifying skills assessed on the AP exam and areas where students need more preparation, drafting course syllabi that meet AP curricular requirements, and designing instruction to provide equitable access to students. The trainings also provided structured time for teachers to network with each other and exchange ideas about teaching AP courses. Grant funding also made the opportunity available to current AP teachers as well as those potentially interested in teaching these courses in the future or applying AP instructional strategies to their other classes.

The second form of professional development provided through the i3 grant was a series of summer “AP Academies” for current and future AP teachers. Organized by the Niswonger Foundation with input from Consortium school teachers, the summer academies ranged in length from one to five days. All academies were led by local AP teachers from Consortium schools and were designed to improve the quality of instruction in existing AP courses. Academy topics included: ideas for ongoing test preparation, new technologies available for laboratory investigations, strategies for preparing and assessing Socratic seminars, and strategies for helping students answer free-response questions effectively on AP exams.

The third form of professional development provided through the i3 grant consisted of annual symposia that were made available to all teachers in Consortium schools. Teachers participated in large group training sessions followed by smaller break-out groups among teachers in the same subject areas. For example, one symposium centered around provid-

ing personalized learning by tailoring learning experiences to the individual needs of students. The state's Education Commissioner gave a keynote address that introduced a new "digital dashboard" being implemented at schools statewide to provide real-time data to identify struggling students.

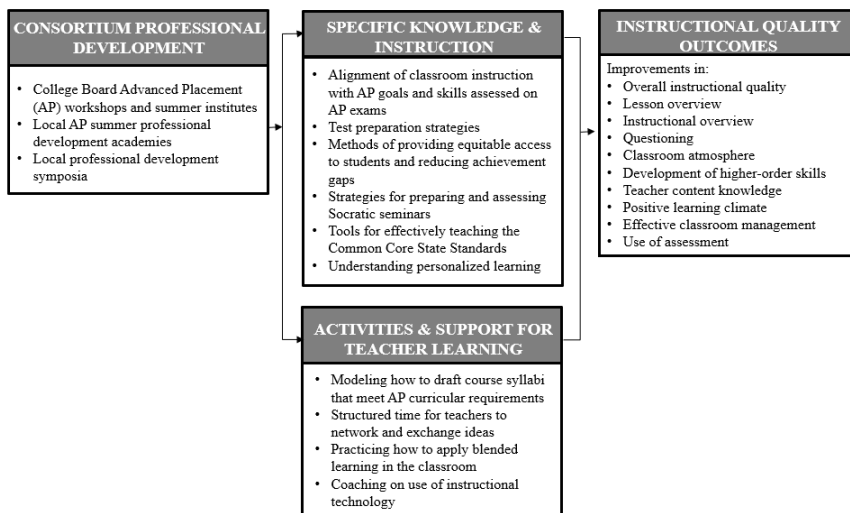
The symposia were also coupled with "hands-on" collaborative days that provided additional opportunities for teachers to practice the techniques learned from the symposia. For the symposium focused on personalized learning, teachers participating in the hands-on day learned how to apply blended learning in the classroom by representatives in the Iredale School District in North Carolina which is considered a national leader in the use of technology. Participants rotated among different practice stations and also developed plans and activities for blended lessons that they could implement in their own classrooms.

Theoretical Framework

According to Wayne and colleagues (2008), the impacts of professional development are moderated through a theory of instruction and a theory of teacher change. Under the theory of instruction, professional development conveys specific knowledge and instruction to teachers about how to improve student achievement. This commonly refers to a focus on instructional practices such as a phonics-based approach to reading. In contrast, the theory of teacher change refers to elements of activities that teachers participate in during professional development which are intended to support teacher learning. For example, a coaching component in a professional development program may provide teachers with individualized guidance and feedback on how to improve instruction. This conflux of influences between the type of content conveyed and the practices engaged in by teachers during professional development makes it difficult to distinguish the specific mechanisms through which professional development may improve teaching in the classroom. Yet taken together, they provide a better understanding of the impact of the *package* of a given professional development intervention (Wayne et al., 2008). Figure 1 illustrates our logic model showing how the specific knowledge and instruction as well as the activities and support for teacher learning from the Consortium professional development are intended to improve instructional quality.

Figure 1

Logic Model for how the Consortium Professional Development is Intended to Improve Instructional Quality Outcomes



Literature Review

Although the literature on the effects of professional development on student performance is inconclusive (e.g. Jacob et al. 2010), there is a growing body of literature, including several longitudinal studies, that examines which approaches to and characteristics of professional development are associated with positive changes in teachers’ instructional practice. Garet et al. (2001) identified a framework of features of effective professional development practices that have been supported by subsequent research (e.g., Desimone et al., 2002; Yoon et al., 2007). The framework includes both core features of professional development content and structural features. Core features include a focus on content and related pedagogical knowledge and skills, an active learning approach, and coherence with other instructional initiatives. Among the structural features, longer-term, sustained professional development is associated with changes in practice. Additional research funded by the U.S. Department of Education defines high-quality professional development as sustained and content focused, aligned with state learning standards, and focused on developing an understanding of “scientifically proven” instructional techniques (Yoon et al., 2007).

The Consortium is a collaborative effort intended to improve both the availability and quality of training opportunities for rural teachers. The Consortium professional development activities are conceptually well-aligned with many of the core features associated with effective pro-

essional development. The content covered in the grant-funded professional development was primarily subject-specific and included both pedagogical techniques and alignment with state standards. Many of the AP academies and hands-on days focused on active learning to provide teachers with opportunities to put into practice the skills they had learned. The structure of the professional development was designed to encourage collective participation, both by providing symposia to all teachers Consortium-wide and by making AP training opportunities available to both AP and non-AP teachers.

Study Overview and Context

In this study, we use evidence from classroom observations to examine whether math and science instructional quality in Consortium schools improved between the beginning of grant activities in 2010/11 and the end of the grant in 2014/15. The two sets of observations were conducted at Consortium schools and a matched group of comparison schools. The comparison schools are a group of 29 non-Consortium Tennessee high schools selected at the beginning of the grant using propensity score matching based on a number of criteria, including student demographics, baseline academic performance, school resources, community characteristics, and availability of AP and career and technical education courses. After matching, there were no statistically significant differences between the Consortium and comparison schools on any of these characteristics (Mokher, Lee, & Sun, 2019).

Teachers in the comparison schools participated in business-as-usual conditions for professional development. Tennessee teachers must complete 60 professional development points (equivalent to one clock hour of professional learning) during the 10-year period for professional licensure (Tennessee Department of Education, 2019). Comparison group teachers did not participate in any of the Consortium's local AP summer academies or professional development symposium. Some comparison teachers may have had the opportunity to attend a national AP workshop through the College Board, although we anticipate that this occurred relatively infrequently since the grant did not provide any funding to pay for these workshops or associated travel expenses in the comparison schools.

Data and Methods

To measure and better understand potential changes in instructional quality under the Consortium, we used the Leadership by Design (LBD) classroom observation instrument developed by Briarwood Associates. This instrument has been widely used in Tennessee and elsewhere; classroom observation data have been collected using the LBD instrument for more than 3,000 teachers in over 250 elementary, middle, and high

schools in seven different states (e.g., Mokher et al., 2018; Tassell et al., 2012). Projects using the LBD include work funded by the U.S. Department of Education and the National Science Foundation. The LBD also has been adopted by the National Science Teachers Association as a program improvement tool to help assess and improve the quality of instruction in middle and high school classrooms.

The LBD is a comprehensive instrument with which trained observers who are subject matter experts measure the quality of a classroom's instructional practices and capture information about the classroom setting. Using the LBD classroom observation instrument, observers collect descriptive data during classroom observations lasting 45 to 90 minutes. The rubric itself consists of 33 elements spanning nine dimensions: lesson overview, instructional overview, questioning, classroom atmosphere, concept development, teacher's content knowledge, learning climate, classroom management, and assessments (see Table 1). After an observation, an LBD Classroom Observation Rubric is used to assign numeric scores to the observational data. The rubric consists of nine instruction-related subscales, plus an overall rating. Each element is rated on a scale of 1 (low) to 5 (high).

The observer also provides an overall rating of instructional quality on the same five-point scale. This overall rating is an independent rating of instructional quality not simply an average of the nine subscale ratings. The overall rating takes into account the observer's general assessment of classroom instructional quality including the effectiveness of instruction, the degree of alignment with objectives and standards for the course being observed, the level of student engagement, and the value of instruction in developing students' higher-order thinking skills. Before each observation, the teacher was asked to provide a lesson plan that described his or her objectives for the lesson and the standards that would be covered during the lesson. The observer then assessed whether the lesson met the objectives and was aligned with the standards. Observers were required to write comments justifying their overall rating.

The Classroom Observation Process

All observers were experienced math or science teachers who had used the LBD instrument in previous studies. The observers conducted two sets of classroom observations in math and science in each of the 29 Consortium schools and in each of the 28 comparison schools at the beginning of the grant. The schools were informed of the visits beforehand and chose the classrooms to be observed. A mix of regular and advanced courses (including AP, International Baccalaureate (IB), honors, and other higher-level courses) were chosen for observations. A limitation of the study is that each classroom was observed only once per visit. However, observers visited two classrooms per subject area in each school so the

school's rating was not based on a single teacher observation.

A second set of classroom observations was conducted at the Consortium and comparison schools in the spring or fall of 2014 near the end of the grant. Whenever possible, the same teachers at baseline were observed again, but if the same teacher was no longer teaching at the school, the principal selected another teacher from the same course subject and level. The same teacher was observed in 73% of the cases.

A total of 442 observations were conducted over the two observation periods—224 at baseline and 218 at the end of the grant period. The observations were split about equally between math (N=222) and science classrooms (N=220), and between Consortium schools (N=227) and comparison schools (N=215). About one-quarter of the observations (N=115) were of advanced classes, and the rest (N=327) were of regular classes. There are a small number of missing observations due to unforeseen circumstances. For example, one school was closed on the planned observation date due to damage from a tornado, and it was not possible to reschedule before the end of the school year.

Table 1

Subscales and Overall Rating Definitions for the Leadership by Design Instruments

Subscale	Definition
Lesson overview	Combines ratings of the quality of lesson objectives, use of instructional resources, content delivery, placement in instructional sequence, and seating arrangement for the lesson.
Instructional overview	Includes measures of student focus, instructional strategies, and awareness of student needs.
Questioning	Combines quality of questions, depth and breadth of participation in discussion, use of target-centered questions, and feedback to responses.
Classroom atmosphere	Integrates ratings of student involvement, classroom management, and classroom culture.
Development of higher-order skills	Combines amount and level of student investigation that takes place with an assessment of the extent to which students' scientific skills are being developed.
Teacher content knowledge	Combines ratings on quality of communication, connecting content to life experiences, use of strategies appropriate to content, and ability to present lesson content from various perspectives.
Positive learning climate	Integrates ratings on communicating high expectations, establishing a positive learning environment, valuing and supporting diversity, fostering mutual respect between teacher and students, and providing a safe environment.
Effective classroom management	Includes measures of the extent to which instruction is based on an accurate assessment of student needs; effective use of time, space, and materials; and instruction that facilitates higher-order thinking.
Use of assessment	Combine ratings of alignment of assessment with learning objectives, use of variety of formative and summative assessments, and degree to which the classroom accommodates diverse learning needs.
Overall rating	Instruction was of high quality and effective for all students; evidence that instruction was based on clearly defined objectives that were fully aligned with standards; all students were engaged in activities requiring higher-level thinking skills.

Research Questions and Analysis Plan

Insight into the effects that i3 grant activities have on the instructional quality of Consortium classrooms is a key goal of this analysis. Gaining this insight is complicated because other concurrent influences, such as state Race to the Top initiatives, may affect instructional quality at all schools in the state. Additionally, all teachers may become more ef-

fective over time as they make strides in their teaching practices. An important aspect of the analysis, therefore, is to compare ratings between Consortium schools and comparison schools identified through propensity score matching. This comparison accounts for such statewide and experiential changes—that is, the comparison school ratings give us an idea of the pattern we might have observed in the Consortium school ratings in the absence of i3 grant activities.

Analyses are conducted using a two-period panel of observations collected before and after the implementation of Consortium activities. Our estimate of the effect of the intervention on instructional quality is a difference-in-differences estimator that is expressed as:

$$\widehat{\delta}_1 = (quality_{post,i} - quality_{post,c}) - (quality_{pre,i} - quality_{pre,c}),$$

where δ_1 is the difference pre- and post- grant in the average difference of instructional quality between the intervention (i) and comparison (c) schools. This approach strengthens the causal inferences of our analyses because it controls for unobserved, fixed, group-specific characteristics. A limitation of this approach is that we do not have individual teacher-level data on participation in professional development. This means the analyses provide estimates of the intent-to-treat impacts through the provision of professional developmental opportunities in the Consortium rather than the treatment-on-the-treated for individual participants.

To test whether δ_1 is statistically significant from zero, we ran a regression analysis where the model is estimated for observation o in school s as:

$$quality_{os} = \beta_0 + \delta_0 post_o + \beta_1 t_{os} + \delta_1 post * t_{os} + \mu_{os}.$$

The intercept, β_0 , is the average instructional quality in the intervention and comparison schools in the period prior to the grant. The parameter δ_0 captures changes in all instructional quality ratings in the intervention and comparison schools pre- and post- grant. The coefficient β_1 measures the effect of other interventions not due to the grant. This estimation strategy helps to disentangle the effects of the intervention from other changes that occur over time. The parameter of interest is on the interaction term, where δ_1 measures the difference in instructional quality due to the intervention, provided we assume that both intervention and comparison schools did not experience changes in instructional quality at different rates for other reasons. The error term is μ_{os} which is clustered by school. Models are estimated overall as well as separately for each subject area.

Findings

Overall Rating of Classroom Instructional Quality

We find that both Consortium and comparison schools experienced gains in overall instructional quality over time, but the gains were greater among the Consortium schools. The coefficient for the post-treatment variable indicates that all schools experienced an increase in instructional ratings of 0.260 on a five-point scale before and after the i3 grant (see Table 2, pages 52-53). However, ratings in the Consortium schools increased by an additional 0.217 point. This suggests that instructional quality increased about twice as much over time in the Consortium schools relative to the comparison schools.

The models disaggregated by course level and subject area provide further insight into where the greatest gains occurred in overall instructional quality. We find that the Consortium schools demonstrated the greatest growth in advanced courses while there were no statistically significant differences between Consortium and comparison schools on ratings gains in regular courses. Overall instructional quality ratings in advanced courses increased 0.463 point more in the Consortium schools relative to the comparison schools. These gains were most prevalent in advanced science courses where instructional ratings increased by 0.577 point more in Consortium schools before and after the grant.

Instructional Quality Ratings by Subscale

We find differences in the results for the subscale instructional ratings by course type and subject area. In math, both the Consortium and comparison schools experienced gains over time in all of the subscales except classroom atmosphere (see Table 3, pages 54-55). These gains ranged from 0.262 point (positive learning climate) to 0.725 (use of assessment) on a five-point scale. However, the gains in Consortium schools were no greater than in the comparison schools. In fact, gains were slightly lower in the Consortium schools in regular math classes for the instructional overview subscale. Results were similar among Consortium and comparison schools in advanced math courses.

Among all science classes, there were similar gains in instructional quality in both intervention and comparison schools for five subscales (instructional overview, questioning, teacher content knowledge, positive learning climate, and effective classroom management) (see Table 4, pages 56-57). The one area where the Consortium schools outperformed the comparison schools was the subscale for development of higher-order skills.

The results disaggregated by course type indicate that changes over time in instructional subscales were similar between Consortium

and comparison schools in regular science classes. Yet, the Consortium schools outperformed comparison schools on four of the nine subscales in advanced science courses (classroom atmosphere, positive learning climate, effective classroom management, and use of assessment). Almost all of these gains were greater than a half-point and were as large as 1.165 points, these findings indicate that the greatest gains in instructional quality over time occurred among the advanced science courses in the Consortium.

Discussion

Evidence from our evaluation of classroom observation data indicates that instructional quality in math and science improved over time in both Consortium and comparison schools. Gains tended to be greater in Consortium schools, particularly among advanced science classes. One important change that may have influenced instructional quality in both Consortium and comparison schools was the statewide introduction of CCSS in math in 2010. Common Core was intended to change math instruction by promoting a greater focus on fewer topics and instituting a more coherent progression of topics from grade to grade (Gewertz, 2015).

Another set of changes that may have influenced both groups of schools simultaneously stem from the national Race to the Top program, in which Tennessee participated beginning in spring 2010. Race to the Top required states to make changes in four core areas: establishing high standards, developing and supporting effective teachers and leaders, creating data systems and using technology to enhance instruction, and turning around low-performing schools. Examples of activities that may have influenced instructional quality include training for principals on how to observe classroom practices and provide feedback, training sessions on new statewide academic standards led by high-performing teachers, and development of school action plans for the standards transition by teams of educators (U.S. Department of Education, 2015).

In addition to these larger state and national changes, Consortium-specific changes may have also contributed to changes in instructional quality over time. Several different types of professional development were provided with i3 grant funding; it is not possible to isolate the effects of each. However, because much of the professional development focused on AP, it is not surprising that the largest effects were found among the advanced courses. Even though teachers of non-AP courses were invited to participate in the Consortium's AP training, they participated at lower rates than teachers of AP courses.

Taken together, our findings suggest that improvements in instructional quality were likely achieved in northeast Tennessee through a combination of national, state, and local initiatives. Most of these involved providing educators with greater access to professional development to

improve the rigor of coursework, either through new state standards or through the AP program. Given the number of different changes occurring simultaneously, it would be difficult to replicate this finding in another setting. However, this study still provides several implications for improving instructional quality in rural settings.

First, rural teachers who are from the region may lack adequate preparation to teach to rigorous standards and may also be teaching out-of-their-field, particularly in STEM-fields where there tend to be greater shortages in rural areas (Kannapel et al., 2015). The broader literature on characteristics of effective professional development indicates that content should be subject-specific and aligned with state standards (e.g., Smylie et al., 2001; Yoon et al., 2007). Interviews with teachers and administrators indicated that some of the most influential professional development they received focused on understanding and implementing the CCSS (Pearson, Carr, & Miller, 2015). More of this type of training could be particularly beneficial to teachers in other rural settings.

Second, students in rural schools often have less access to rigorous courses than do students in urban or suburban schools (Anderson & Chang 2011; Levin, 2007). Expanding access to rigorous courses may be particularly important for rural schools such as those in the Consortium which historically may have had limited availability of such courses. In order to increase these types of course offerings, schools should consider increasing the number of AP-certified teachers, providing additional professional development related to AP to improve the instructional quality of these courses, and also allowing non-AP teachers to participate in these types of training opportunities so that similar rigorous strategies can be applied schoolwide to better prepare students for advanced course taking.

Finally, it may be difficult to maintain teacher quality as access to professional development is limited by geographic isolation and lack of necessary staff in rural districts (Hansen, 2009; Rude & Brewer, 2003). One way to address this problem is by using a Consortium-based approach that pools resources from a group of surrounding districts. For example, in the Consortium funded through this i3 grant, administrators identified teachers with the highest AP English exam pass rates to share strategies for helping students to pass the AP exam with all other AP English teachers in the region. This type of collaborative approach may allow districts to provide more opportunities than they may be able to otherwise on their own increasing the pool of qualified instructors to draw from.

Table 2

The Effect of the Consortium on Overall Classroom Observation Ratings, by Subject Area

Subject	All				Regular	
	Post	Treat	PostXTreat	Post		
Math and Science	0.260 (0.105)	* -0.832 (0.128)	** 0.217 (0.142)	~ 0.225 (0.115)	~	
Math only	0.370 (0.118)	** -0.174 0.128	0.264 (0.181)	0.351 (0.123)	**	
Science only	0.143 (0.134)	-0.174 (0.128)	0.176 (0.178)	0.065 (0.180)		

Table 2 (cont.)

Regular (cont.)		Advanced				
Treat	PostXTreat	Post		Treat	PostXTreat	
-0.174 (0.128)	0.115 (0.169)	0.365 (0.183)	*	-0.174 (0.128)	0.463 (0.240)	~
-0.174 0.128	0.208 (0.194)	0.453 (0.352)		-0.174 (0.128)	0.308 (0.439)	
-0.174 (0.128)	0.045 (0.213)	0.309 (0.180)	~	-0.174 (0.128)	0.577 (0.277)	*

Note. These results are based on the difference-in-differences specification described in the text. “Post” refers to the classroom observation period at the end of the i3 grant, “Treat” refers to teachers in schools participating in the Consortium professional development activities, and “PostXTreat” is an interaction term for the difference in instructional quality in the post-grant period due to the intervention. N=422 for math and science, N=222 for math only, and N=220 for science only. Standard errors (in parentheses) are clustered at the school level. Coefficients are statistically significant at the ~p<.10, *p<.05, and **p<0.1 levels.

Table 3

The Effect of the Consortium on Math Classroom Observation Subscale Ratings

Subscale	All math			Regular math		
	Post		Treat	PostXTreat	Post	
Lesson overview	0.513 (0.100)	**	-0.039 (0.109)	-0.224 (0.161)	0.498 (0.096)	**
Instructional overview	0.699 (0.119)	**	0.049 (0.144)	-0.354 (0.191)	~ 0.719 (0.119)	**
Questioning	0.658 (0.136)	**	-0.089 (0.150)	-0.324 (0.228)	0.644 (0.143)	**
Classroom atmosphere	0.127 (0.095)		-0.071 (0.124)	0.075 (0.167)	0.125 (0.110)	
Development of higher-order skills	0.679 (0.130)	**	-0.095 (0.147)	-0.128 (0.228)	0.650 (0.133)	**
Teacher content knowledge	0.387 (0.128)	**	0.091 (0.124)	-0.213 (0.206)	0.375 (0.133)	**
Positive learning climate	0.262 (0.099)	**	-0.041 (0.113)	0.056 (0.146)	0.236 (0.096)	*
Effective classroom management	0.428 (0.118)	**	-0.033 (0.144)	0.059 (0.173)	0.428 (0.112)	**
Use of assessment	0.725 (0.195)	**	-0.234 (0.201)	-0.060 (0.270)	0.753 (0.159)	**

Table 3 (cont.)

Regular math (cont.)			Advanced math		
Treat	PostXTreat		Post	Treat	PostXTreat
-0.039 (0.109)	-0.213 (0.155)		0.576 (0.283)	* -0.039 (0.109)	-0.321 (0.386)
0.049 (0.144)	-0.437 (0.204)	*	0.614 (0.357)	~ -0.049 (0.144)	-0.104 (0.446)
-0.089 (0.150)	-.406 (0.246)		0.171 (0.373)	~ -0.089 (0.151)	-0.153 (0.464)
-0.071 (0.124)	0.014 (0.181)		0.137 (0.284)	-0.071 (0.124)	0.207 (0.373)
-0.095 (0.124)	-0.239 (0.218)		0.805 (0.322)	~ 0.095 (0.124)	0.045 (0.430)
0.091 (0.124)	-0.227 (0.218)		0.439 (0.322)	0.091 (0.124)	-0.257 (0.430)
-0.041 (0.113)	0.038 (0.149)		0.375 (0.230)	-0.041 (0.114)	0.021 (0.291)
-0.033 (0.144)	0.019 (0.198)		0.426 (0.417)	-0.033 (0.144)	0.166 (0.452)
-0.234 (0.201)	-0.104 (0.277)		0.606 (0.496)	-0.234 (0.201)	0.056 (0.569)

Note. These results are based on the difference-in-differences specification described in the text. “Post” refers to the classroom observation period at the end of the i3 grant, “Treat” refers to teachers in schools participating in the Consortium professional development activities, and “PostXTreat” is an interaction term for the difference in instructional quality in the post-grant period due to the intervention. N=222 for all math, N=164 for regular math, and N=57 for advanced math. Standard errors (in parentheses) are clustered at the school level. Coefficients are statistically significant at the ~p<.10, *p<.05, and **p<0.1 levels.

Table 4

The Effect of the Consortium on Science Classroom Observation Sub-scale Ratings

Subscale	All Science			Regular science		
	Post		Treat	PostXTreat	Post	
Lesson	0.173	**	-0.039	0.023	0.077	
Overview	(0.124)		(0.109)	(0.188)	(0.189)	
Instructional	0.500	**	0.049	-0.150	0.402	*
Overview	(0.140)		(0.144)	(0.200)	(0.189)	
Questioning	0.504	**	-0.089	-0.100	0.462	*
	(0.153)		(0.150)	(0.231)	(0.204)	
Classroom	0.075		-0.071	0.113	-0.030	
Atmosphere	(0.134)		(0.124)	(0.193)	(0.180)	
Development	-0.235	~	-0.095	0.348	~	~
of Higher-order Skills	(0.140)		(0.147)	(0.213)	(0.210)	
Teacher	0.471	**	0.091	-0.033	0.396	*
Content	(0.141)		(0.124)	(0.207)	(0.185)	
Knowledge						
Positive	0.234	*	-0.041	0.058	0.196	
Learning	(0.104)		(0.113)	(0.171)	(0.140)	
Climate						
Effective	0.384	**	-0.033	0.058	0.357	~
Classroom	(0.145)		(0.144)	(0.213)	(0.194)	
Management						
Use of	0.129		-0.234	0.362	0.306	
Assessment	(0.234)		(0.201)	(0.300)	(0.258)	

Table 4 (cont.)

Regular Science (cont.)		Advanced Science				
Treat	PostXTreat	Post		Treat	PostXTreat	
-0.039 (0.109)	-0.026 (0.225)	0.365 (0.188)	~	-0.039 (0.109)	0.209 (0.259)	
0.049 (0.144)	-0.284 (0.239)	0.690 (0.176)	**	0.049 (0.144)	0.284 (0.268)	
-0.089 (0.150)	-0.278 (0.276)	0.588 (0.222)	*	-0.089 (0.151)	0.398 (0.332)	
-0.071 (0.124)	0.016 (0.251)	0.284 (0.223)		-0.071 (0.124)	0.493 (0.284)	*
-0.041 (0.113)	-0.006 (0.207)	0.311 (0.118)	*	-0.041 (0.114)	0.306 (0.168)	~
0.091 (0.124)	-0.138 (0.251)	0.621 (0.223)	**	0.091 (0.124)	0.233 (0.284)	
-0.041 (0.113)	-0.006 (0.207)	0.311 (0.118)	*	-0.041 (0.114)	0.306 (0.168)	~
-0.33 (0.144)	-0.086 (0.257)	0.440 (0.202)	*	-0.033 0.144	0.501 (0.301)	~
-0.234 (0.201)	0.000 (0.317)	-0.224 (0.251)		-0.234 (0.201)	1.165 (0.404)	*

Note. These results are based on the difference-in-differences specification described in the text. “Post” refers to the classroom observation period at the end of the i3 grant, “Treat” refers to teachers in schools participating in the Consortium professional development activities, and “PostXTreat” is an interaction term for the difference in instructional quality in the post-grant period due to the intervention. N=220 for all science, N=161 for regular science, and N=58 for advanced science. Standard errors (in parentheses) are clustered at the school level. Coefficients are statistically significant at the ~p<.10, *p<.05, and **p<0.1 levels.

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Christine Mokher is an associate professor at Florida State University.

Juliana Pearson is an associate research analyst at the Center for Naval Analyses (CNA) in Virginia.

Thomas Geraghty is a research scientist at the Center for Naval Analyses (CNA) in Virginia.

PRINCIPAL PRACTICES THAT BUILD AND SUSTAIN TRUST: RECOMMENDATIONS FROM TEACHERS IN A HIGH-TRUST SCHOOL

Understanding how principals build and support trust can inform school leaders' practice and efforts to retain teachers in the profession. The purpose of this study was to understand teachers' perceptions of principals' trust-building actions and dispositions. A qualitative case study was designed to understand trust as a multifaceted social phenomenon. Identified from a larger sample in a statewide study, the site was selected based on three criteria: high trust in the principal as evidenced by the Omnibus Trust Scale, the number of years the principal has been the school leader, and faculty stability over a five year period. Evidence was provided through semi-structured interviews with 14 teachers and a focus group research activity with 26 faculty. Thematic coding and data analysis was guided by the Five Facets of Trust, Social Capital Theory and Bandura's Self-Efficacy Influences. Teacher participants created five recommendations for principal actions that build and sustain trust. Findings suggest principals can create and support a high trust environment through specific actions which demonstrate benevolence, openness, honesty, reliability, and competence.

Keywords: trust, principal leadership, self-efficacy, social capital, teacher retention

As the Greek philosopher Heraclitus said, "Change is the only constant in life." This reality is evidenced as principals and teachers strive to incorporate reform initiatives into an overflowing list of professional responsibilities. New curriculum standards, accountability mandates, technology, instructional materials, and attending to children's social and emotional well-being are just a few initiatives leaders balance as they strive to recruit and retain teachers (Fullan, 2010; Tschannen-Moran & Gareis, 2015a, 2015b). Central to success is a principal who fosters relationships and creates a positive climate through specific leadership actions and interpersonal behaviors that build and sustain trust (Boies & Fiset, 2019).

Defining and understanding the construct of trust has been an educational research focus for over 30 years (Bryk & Schneider, 2002; Hoy & Kupersmith, 1985; Hoy & Tschannen-Moran, 2003; Tschannen-Moran, 2004). Goddard et al. (2009) found high-trust schools also demonstrated high levels of achievement and suggested additional research focused on ways to increase the level of trust in schools as a lever for closing achieve-

ment gaps. Scholars have also found that in schools characterized by high trust, principals and teachers work together to set goals, monitor progress, and meet students' needs (Forsyth et al., 2011). Additionally, teachers in high-trust schools express professional satisfaction, feel more efficacious, and share social capital (Demir, 2015). Importantly, a high-trust environment reduces stress and increases professional satisfaction (Collie et al., 2012).

While previous studies help us to understand the connections between trust, positive student outcomes, and teacher satisfaction, identification of specific actions and behaviors principals can use to create and sustain a high-trust environment is needed. The unique insight of teachers with high trust in the school principal may contribute to this knowledge. Teacher perceptions about trust-building behaviors can provide critical-guidance for leaders and researchers seeking to understand how trust is-manifested in educational organizations.

Overview of Literature and Theoretical Frameworks

A literature review related to trust and leadership was conducted to understand what is known about trust in the school context. Social Capital and Self-Efficacy theories were used as frameworks to further understand the relationship between trust and its possible impact on factors that may contribute to teacher satisfaction and retention.

Trust: A Multifaceted Construct

In early studies of trust as a reform resource, Bryk and Schneider (2002) identified themes of respect (e.g., interdependence, personal regard, integrity, and competence) as essential to the concept of relational trust. Hoy and Tschannen-Moran (2003) defined trust as “an individual’s or group’s willingness to be vulnerable to another party based on the confidence that the latter party is benevolent, reliable, competent, honest, and open” (Hoy, n.d.). They further defined and posited these trust facets could act as behavioral antecedents that cultivate and foster faculty trust in the principal (Hoy & Tschannen-Moran, 2003).

Trust and the Principal as Leader

Studies of trust and leadership support the importance of the principal in establishing a culture of trust through demonstration of respect, integrity, competence, benevolence, and reliability (Cranston, 2011; Tschannen-Moran, 2004). To improve student outcomes, the principal must manage competing time and attention demands while also developing and implementing a vision, creating structures that support cooperation, using data to make decisions, and ensuring all stakeholders feel valued (Louis &

Murphy, 2017). This can be overwhelming for the most skilled leader. As Tschannen-Moran and Garies (2015b) articulate:

Although most educators acknowledge the importance of trust in their work, these qualities too often get squeezed out with the pressures of accountability. Such pressures can drive school leaders to impatience and anxiety, resulting in a climate of tension and fear that interferes with the learning of both children and adults. (p. 257)

While some leaders may view building trust as an additional duty, in fact it can be a leverage point that supports the social capital networks and teacher efficacy needed to effectively meet ever-changing educational challenges (Liou & Daly, 2014).

Trust and Social Networks

Effective leaders work through collaborative social networks to build trust (Adams, 2008; Forsyth et al., 2006; Forsyth et al., 2011; Goddard, 2003; Van Maele, 2014). In collaborative networks, relationships increase “individual morale, self-esteem and selfworth, and are central to dealing with uncertainty, unpredictability and risk” (Kutsyuruba et al., 2011, p. 83). Trust is both a lubricant (Adams & Forsyth, 2009) and glue (Cranston, 2011; Fullan, 2010) for the work principals must do to manage and lead a school. By creating systems that support teachers’ work, leaders can reduce teacher isolation and increase the level of trust needed to work as a team.

Acknowledging that “trust is increasingly recognized as an essential element in vibrant, well-performing schools” (Tschannen-Moran & Garies, 2015b, p. 257) and that “trust lies at the heart of a functioning, cohesive team” (Lencioni, 2002, p. 195) an understanding of the nature of social capital can contribute to a principal’s capacity to nurture a trusting-school climate.

Social Capital Theory

Putnam (1993) described social capital as “features of social organization, such as trust, norms, and networks that can improve the efficiency of society” (p. 167). Social Capital theory provides three lenses through which power and influence can be perceived. Bridging social capital provides members external access to diverse perspectives and resources. Bonding social capital builds on members’ shared characteristics and knowledge. Linking social capital requires authentic relationships and high levels of trust among network members because one or more member may have positional power over others (Putnam, 2000; Woolcock, 1998). In the educational context, bridging, bonding, and linking social capital may be built through shared experiences and resources within and across

grade or subject area teams.

Trust and Self-Efficacy

Teacher efficacy is described as a teacher's "judgment of his or her capabilities to bring about desired outcomes of student engagement and learning, even among those students who may be difficult or unmotivated" (Tschannen-Moran & Woolfolk Hoy, 2001, p.783). Bandura (1994) posited that self-efficacy is influenced in four ways: mastery experiences (success), vicarious experiences by models (seeing others succeed), social persuasion (affirmations and feedback), and reducing stress (feeling safe being vulnerable).

Effective leaders recognize that positive relationships and self-efficacy are essential to achieving an organization's goals (Demir, 2015). Through facilitation of professional relationships, principals may create an environment in which teachers feel safe innovating in their practice, learning from one another, and sharing rather than competing for resources. Devoting time and energy to creating environments that support collaboration and nurture trust increases efficacy and teacher fulfillment (Collie et al., 2012; Demir, 2015; Eliophotou-Menon & Ioannouz, 2016; Fullan, 2010; Tschannen-Moran, 2004).

Creating a Climate of Trust

Effective principals recognize the impact trust can have on teachers' self-efficacy and job satisfaction (Collie et al., 2012; Demir, 2015; Eliophotou-Menon & Ioannouz; 2016). Building social networks to achieve the goal of educating all children at high levels requires a principal teachers trust. Understanding how to create a trusting environment may inform educational leaders' work. Therefore, the purpose of this study was to understand teachers' perceptions in a school with high trust in the principal and to identify strategies leaders can utilize to build trust and to support teachers, retaining them in the profession.

Research Design

Because trust is a multifaceted social phenomenon, a case study was chosen to understand how trust is developed (Yin, 2014). The research site was derived from quantitative research conducted in 2014 to measure the level of trust in 95 California schools (Bukko, 2014). To provide context, the two phases involved in site selection for this study are described.

Phase One: Identifying High-Trust Schools

In the quantitative study, the Omnibus Trust Scale (Hoy, n.d.) was

used to measure the level of teacher trust in the principal, colleagues, and clients (Goddard et al., 2001; Hoy, 2002; Hoy & Tschannen-Moran, 2003). The target population included K-12 public schools at which the principal was the leader for at least two school years. The level of teacher trust in the principal at these schools ranged from a minimum of 208 (lower than 99% of schools in the normative sample) and a maximum of 701 (higher than 97% of schools in the normative sample) (Hoy & Tschannen-Moran, 2003). In the original study, 14 of the 95 schools met this high-trust criteria, all of which were at the K-8 grade levels. Schools with a trust in principal score of 600 or higher (higher than 84% of other schools) were considered high-trust in phase 2.

Phase 2: Qualitative Case Study

As the purpose of the case study research was to gain a deeper understanding of how trust in the principal is developed and supported, it was necessary to first investigate the current context at the 14 high-trust schools identified in the quantitative study. To limit possible variables that might influence the level of trust in a school, inclusion criteria for the case study were: (1) the principal continued in the leadership role between 2014-2018; (2) staffing remained stable with at least 80% of teachers at the same school between 2014-2018; (3) access to the site was granted; and (4) at least 80% of teachers gave informed consent. Six of the fourteen schools met the four inclusion criteria.

With support from district-level administrators, informed consent was obtained, and teachers at each of the six schools completed the Omnibus Trust Scale. Results indicated that two of the six schools maintained a high level of trust (600 or higher) in the principal. Permission to conduct a qualitative case study at one of the two sites was granted. The second site was excluded by the superintendent because the principal was being moved to a district office position mid-year, creating a transition with which teachers were struggling.

Research Site

Golden Valley Elementary School is a K-6 California school. 83% of students qualify for the National School Lunch Program (NSLP) and 40% are English learners. Purposive sampling was used as it provided for information-rich data from the teachers knowledgeable of factors within the organizational culture that may contribute to the level of trust in the principal (Merriam & Tisdell, 2016). In the 2013-2014 school year, there were 23 teachers on staff, and 17 had worked at that school for their entire careers. In 2018-2019, there were 28 teachers at Golden Valley Elementary. Twenty of the 23 teachers who participated in the 2014 quantitative study remained on staff. To learn from the perspectives of teachers who

had joined the school staff subsequent to the 2014 study, these five staff members were also invited to participate in the focus group phase of data collection. The principal had been the school leader since 2010.

Data Collection and Analysis

Data were collected in two stages. In the first, interviews were used to gather individual teacher perceptions. Data were then analyzed and initial findings were developed. In the second stage, initial results were presented to teachers in a focus group. This allowed for member checking and further theme exploration. Focus group participants then generated lists of actions they believe a school leader can take to build and sustain a trusting climate. Throughout data collection and analysis, researchers engaged in reflexivity, collaborative and independent coding, and peer review to look for data that may support alternate findings (Merriam & Tisdell, 2016).

Semi-structured interviews were conducted with 14 teachers; as all teachers had volunteered to participate, two teachers were chosen at random from each of the grade levels. Recognizing the positional power of the principal and the potential for participants to be hesitant to speak directly about leadership and trust, indirect questions were used (Merriam & Tisdell, 2016). Open questions such as “Describe any reasons you believe teachers might enjoy working at this school” and “If I were a teacher, to whom might I go for support” were used to explore possible reasons for the high level of trust. Participants were also asked questions which generated description of challenges and points of celebration related to their work as teachers.

Data were analyzed using thematic analysis and open coding (Braun & Clarke, 2006). All of the emergent codes were then analyzed to confirm or refute possible relationships with the five facets of trust (e.g. benevolence, honesty, openness, reliability, and competence). There was no evidence found that refuted one or more of the facets, nor were new potential facets identified. Therefore, these facets were used as a frame during the focus group.

In the second stage, a focus group was conducted to present preliminary findings, engage in member checking, and to complete the second stage of data collection with 26 of the 28 teachers participating. The focus group provided the opportunity for further exploration of themes that emerged from analysis of data and also served as a resource to refute or corroborate initial findings (Creswell & Creswell, 2018).

To maximize teacher voice and to generate additional data, focus group participants engaged in a research activity. Working in pairs, participants generated lists of actions they believe leaders may take to contribute to a trusting school climate. The group then re-assembled to discuss actions they had identified and to share additional experiences that had emerged as a result of their partner and full group discussions. Partici-

pants then categorized the actions they had identified into recommendations leaders might use to build and sustain trust.

Observation notes and artifacts generated during the focus group were analyzed for latent and manifest meaning using document and thematic analysis (Bowen, 2009). Codes and themes from the interview and focus group transcript analysis were used and the documents were also studied for emerging themes. This additional data analysis served as triangulation, providing for corroboration of evidence and to reduce the impact of potential bias (Merriam & Tisdell, 2016).

Limitations

Case study research provides the opportunity to explore and learn from a phenomenon (Yin, 2014). As a high-trust school in which the principal and staff have remained constant over a period of time, the level of collaboration and trust evident in this school may be attributed to more than the specific actions and behaviors of this individual principal. Although open-ended questions were used during data collection, other contextual or contributing factors may not have emerged. A limitation of this study is the focus on the principal's trust-building actions from teachers' perspectives. It should be noted, however, that this research provides a model for other schools seeking to replicate it for self-study within their specific context.

Findings

Results suggest the pressure to implement educational initiatives made teachers' work more challenging. Evidence indicates these challenges were countered by specific principal actions supporting teacher development of social capital and self-efficacy. Findings related to themes of challenges and celebrations are explained. Teacher recommendations for specific actions principals may take to build and sustain trust are presented within the five facets of trust identified by Hoy and Tschannen-Moran (2003).

Challenges

Three intertwined reform initiatives were identified as the most significant challenges impacting teacher work: Accountability, Technology, and Social and Emotional Learning.

Accountability

New state content standards and state testing systems were identified as having the most significant impact on teachers' daily work. One

participant shared, “The change is overwhelming in the last few years. First we had to learn new standards, but we still had the old instructional materials. Then new tests. Now technology. It’s been so fast!”

Technology

Teachers cited online state testing and preparing students for the future as two reasons for a technology emphasis. One participant articulated the challenge technology poses: “I have never been very tech savvy, so computers really made me think about whether I want to keep teaching. If it had not been for my team, I would have retired.”

Social and Emotional Learning

Being student-centered and focused on the whole child emerged across all interviews. One teacher reflected this commonality when she said, “the kids work hard but they are distracted and that makes it challenging to teach. If I don’t make it a priority to reduce their stress, we can’t get to the learning.”

It was clear teachers at Golden Valley are student-centered with high learning expectations. They are also aware their profession requires teaching content in humanistic ways that may create emotional labor: “I’m tired at the end of the day. The principal pushed me to think about the good I do for kids. He helped me see if I take care of myself, I can help them.”

Celebrations

Two celebration themes emerged: student growth and adults taking on new challenges. Teachers spoke of students who demonstrated academic and social-emotional growth, highlighting student persistence: “Students enjoy setting and demolishing their own goals”. Adult-based celebrations reflected admiration for peers who had taken on a challenge. Some had assumed leadership roles for special campus projects. Others volunteered to change a grade level so a peer with health issues did not have to change. Their commitment to one another was also seen in their celebration of those pursuing education: “One of my team members just finished her master’s degree. We are so proud of her!”

Facets of Trust

Trust-specific results are presented and include the Hoy and Tschannen-Moran (2003) trust facet definitions. Evidence of teacher perceptions of trust-building behaviors were clustered into five teacher-created recommendations, and specific principal actions and the impact of those actions on teachers are provided.

Benevolence

Benevolence creates confidence that the interests and well-being of an individual are protected. This provides assurance the person they are trusting is someone with whom they feel safe being vulnerable and without fear of being taken advantage (Hoy & Tschannen-Moran, 2003).

Teacher Recommendation. To show benevolence, the principal should demonstrate the belief that teachers want to do well.

Principal Actions. Participants explained that relationships and a caring nature are essential to being an effective leader. “Know us as people and trust us as professionals” resonated throughout the data, and a focus on professional, friendly relationships was emphasized. Several participants explained the importance of a principal knowing staff as individuals: “I need a principal who will show interest in how I am doing.” Showing compassion for others and assuming teachers are doing their best was another common finding. Teachers expressed appreciation for compassion, and yet they know they are still expected to perform: “Even though he cares, I know he expects my best for the students. He’s a professional.”

One principal action participants advised was to make evaluations meaningful: “At Golden Valley we can take risks because the principal tells teachers he does not expect a perfect lesson.” Another teacher shared that she feels comfortable taking risks: “After the principal observes me, I know I will be doing most of the talking. He wants to learn what I am thinking. He will be honest and will give me good suggestions.”

Impact on Teachers. The impact of professional relationships, compassion with accountability, and meaningful evaluations that encourage risks creates a climate in which teachers feel valued and capable: “We belong here. This is our school. We want to be trusted. It’s not that we know it all, but we are not little kids. We are professionals.” Building on this, teachers in the focus group also explained that they value the principal’s encouragement of shared learning: “He provides subs for us to observe and co-teach, to collaborate, and to learn from one another.”

Teachers shared they are encouraged to innovate in approaches which has helped them to differentiate and meet individual students’ needs:

After an observation, I told the principal I couldn’t figure out why the students were struggling. He said, “I wonder what the students would say they need. So, I asked them, and they said they listen when I talk but need more time to think. I broke the lesson into smaller pieces and gave them time to collaborate before I moved on. It worked so well!

Working with a principal who demonstrates benevolence through relationships, high performance expectations, and a commitment to growth creates an environment in which teachers feel safe taking risks.

Honesty

Honesty is demonstrated when an individual acts with integrity and authenticity. He or she takes responsibility for actions and does not place blame or present facts in a distorted way even when it may be in their favor to do so (Hoy & Tschannen-Moran, 2003).

Teacher Recommendation. To demonstrate honesty, the principal should show integrity by acting in ways that reflect their words.

Principal Actions. Participants recommended that principals hold true to their commitments, clearly communicate their beliefs, and treat each individual respectfully. A theme which resonated was the principal's deep commitment to ensuring teachers succeed. While participants expressed their appreciation for his care and concern, they each made clear that "when it comes down to it, the students come first. Even if that makes adults uncomfortable." During the focus group one teacher laughed and shared: "He doesn't pull punches but is respectful. He says, 'I will tell you what I think and invite you to do the same.' I thought, 'I wonder if he really will.' Yup. He's authentic when he says, 'Let's chat.'"

Teachers associated these actions with both respect and integrity. They also shared their observation that the principal does not talk badly about another person. When prompted to expand, one participant shared, "You know, some will take you in confidence and talk about another person. Like to get you on their side. It actually makes me wonder what that person might be saying behind my back." Others explained that the principal treats everyone with respect regardless of their position. One shared, "Everyone is valued. He's very authentic in wanting people to be successful. It makes me want to be the best person I can be."

Impact on Teachers. Acting with integrity and respect and holding true to a commitment to student success resonated with teachers and influenced their decision to mirror this behavior with fellow teachers. "When new teachers join our team, we tell them right from the beginning that we respect each other here." Teachers explained, "Don't get me wrong, we are not always 'one happy family.' We disagree but we do it respectfully. We have norms and listen and then talk and try to see things from the other person's perspective." Mutual dependence and a desire to do their best even when challenged was a consistent theme when discussing honesty as a trust facet. Participants described their work as challenging but explained that they "grow and move forward" if they can "have tough conversations about things that matter". They attribute this climate to the principal's expectation for serving students and working together as professionals.

Openness

Openness is communicated when an individual is transparent,

sharing information in ways that supports reciprocal trust. When acting with openness, there is no fear of a person acting with a motive other than one that has been clearly articulated (Hoy & Tschannen-Moran, 2003).

Teacher Recommendation. To show openness, a principal should show humility and how to be a learning leader.

Principal Actions. Participants expressed that acting with humility and being transparent with a willingness to learn helps teachers be vulnerable. Explaining they can always count on him to provide reasons and data behind initiatives, teachers shared they appreciate that the principal solicits their input and authentically listens to their ideas. One teacher stated, “He always has an ‘anything is possible’ attitude.” Another echoed her appreciation for the brainstorming sessions they have. “Our one rule is to consider anything, no matter how extreme or ‘out there’ it might be.” At these meetings, the principal “always listens more than talks. When he offers suggestions, they show he values our ideas and wants to share decision making.”

Impact on Teachers. The principal’s openness to learning from teachers and to new ideas creates a sense of shared responsibility in achieving school goals: “He tells us we are leaders. We have to help each other because this work is too hard to do by ourselves.” Expanding on this, teachers explained that they often brainstorm in teams. “It’s nice to know we can count on each other and know that when we can’t fix something the administrators will be willing to bounce ideas with us.” Teachers cited this as an example of why they are committed to remaining in the profession.

Reliability

Reliability is communicated when an individual’s behaviors are consistent. Others have confidence that they know what to expect and that their needs will be met (Hoy & Tschannen-Moran, 2003).

Teacher Recommendation. To show reliability, the principal has to be consistent in actions and communication.

Principal Actions. Teachers believe principals who are fair, whose actions match their words, and who are predictable can be counted upon to support them. Valuing their principal because he “appreciates we have expertise and never wastes our time with unimportant emails or meetings” and “always makes sure we have what we need to do our jobs well,” participants emphasized the importance of being able to predict what the principal would say or do in different types of situations. “He is always respectful, and he always listens carefully. That never changes, whether it is a casual conversation or a heated meeting with an angry parent.” In addition to being consistent, the participants shared that the principal models what it means to differentiate to meet individuals’ and the group’s needs. They emphasized the importance of not “playing favorites” because that creates competition and makes it hard for them to trust

and collaborate with others: “We get what we need. Some people might need more than others. We don’t compete because we all know when we need something he will support us.” Additionally, teachers shared that the principal consistently encourages them to celebrate successes and to take care of their emotional health: “He is sincere when he says to take care of ourselves. It’s nice to know he expects us to work hard but that we should also recharge.”

Impact on Teachers. Feeling valued and reassured they do not have to waste energy anticipating what the principal wants or will do was cited as being impactful to teacher practice and sense of well-being. Participants were clear that improvement is an ongoing principal expectation: “We talk about innovation, but there is also this core of sameness. He is going to come with data and ask us to think about what we aren’t seeing. He’s always open to new ideas.” Teachers also emphasized that knowing what to expect reduces their stress.

Competence

Competence is communicated when an individual performs duties in ways that demonstrate knowledge and the ability to apply that knowledge in ways that meet or exceed expectations (Hoy & Tschannen-Moran, 2003).

Teacher Recommendation. To demonstrate competence, the principal should understand instructional practices deeply and provide meaningful feedback.

Principal Actions. Participants distinguished between managing and leading when discussing competence-related actions. As a manager, the principal must be able to “get things done.” Emphasizing the importance of a leader who makes instruction and learning the priority, teachers also discussed instructional knowledge as essential to being a trusted leader. “To respect a principal, I need to know he understands how teaching and learning works. How can he help me be a better teacher if he doesn’t understand how students learn?”

During the focus group, teachers discussed the instructional knowledge effective principals must know to be good leaders. They expressed the belief that principals cannot really understand what it means to teach if they have not been a teacher themselves, but they also shared that they do not believe a principal must have taught at the same grade level as the school they lead. “Our principal is a great teacher. You can see that in our staff meetings and when he works with students in the classroom. He was a secondary teacher, but he still knows teaching.” The participants also shared that they valued their principal’s willingness to be vulnerable. “If he doesn’t know something, he’s the first to admit it. He asks for input and time to research. He says all the time, ‘Our students are learners and we are too.’”

Impact on Teachers. Teachers felt the school is managed well; this positively impacted their teaching because they had the resources and communication they needed. Significantly, the principal's competence in instructional leadership was evidenced in feedback: "He's always giving me great feedback tied to what happened for students. That helps me think about my teaching." Participants articulated that meaningful feedback helped them to feel more confident.

An additional impact resulting from the principal's leadership competence is increased teacher collaboration and trust. Teachers explained the principal is kind but also holds them accountable for how they work together as a team: "One time a teacher said something, and I was snarky. He said he understood I was tired, but that we always talk to each other as professionals." The balance of competence in the form of knowledge, being a learner, and holding one another accountable were cited as positive examples of the principal's leadership.

Discussion

The level of trust teachers have in the principal is evident at Golden Valley Elementary. The principal's actions and dispositions reflect the five facets of trust which he uses within social networks to build teachers' self-efficacy.

Through benevolence the principal creates trust by balancing the need to push with the need to pull. He leverages competence in managing and leading the school and demonstrates honesty by ensuring his actions reflect the core belief that "students come first." Teachers feel safe taking risks and being vulnerable due, in part, to the principal's openness to new ideas and reliably providing structures and resources teachers need to overcome professional challenges (Kochanak, 2005; Tschannen-Moran, 2004).

In this school, the principal supports social capital networks, creating teams that utilize bonding and bridging capital (Putnam, 2000). In addition, he links his social capital to theirs, working within teams while also aware of his positional power (Woolcock, 1998). As an instructional leader, he leverages his competence to build trust, encouraging teachers to think about their practice and to innovate. In addition, through engagement in meaningful professional learning, teachers share in the challenge of reflecting on their practice and making positive changes for the benefit of one another and their students (Kars & Inandi, 2017).

Through networks and shared resources, the principal creates a climate that lowers stress, provides affirmations, and supports ongoing success, all of which contribute to teachers' self-efficacy (Bandura, 1994). By creating a climate that strengthens the self-efficacy influences of mastery experiences, social models, social persuasions, and reduced stress, the principal builds and supports a climate of trust which contributes to teach-

ers believing they are capable of teaching all students effectively.

Implications

Three implications emerged from the findings. First, findings may inform hiring practices. Providing hypothetical scenarios during interviews may make transparent how a candidate will respond in a situation requiring dispositions teachers associate with trust. Additionally, having the candidate watch a video of a lesson and then provide feedback during the interview may reveal the individual's level of instructional leadership competence. Teachers are more likely to trust a principal who can provide meaningful feedback that includes both affirmations and constructive suggestions.

Second, findings from the initial research showed that only 14 of 95 schools evidenced a high level of trust. This indicates there may be a need for increased attention to trust-building behaviors in leadership preparation programs and ongoing professional development. Administrator preparation programs and district leaders can develop and reinforce leaders' trust building behaviors through modeling and collaborative learning. By adding role play to trainings on policy-driven mandates (such as evaluations) and workshops on providing feedback, leaders can guide development of principals' self-efficacy in how to balance compassion with high expectations and accountability. Structuring workshops in this way will also communicate that social capital networks can be leveraged to support development of these traits.

Third, principals may benefit from creating a plan for building and supporting trust in their schools. Such a plan should include the opportunity to reflect on the school goals and how trust might be utilized to increase teacher collaboration and self-efficacy. Considering how they will purposefully manifest actions related to each of the facets of trust as well as facilitating bridging, bonding, and linking social capital and the four influences for building self-efficacy may do much to help a principal use trust to balance the many demands of school leadership.

Conclusion

Findings affirm previous studies related to trust in the school context and indicate increasing the level of trust between teachers and the principal may contribute to teacher self-efficacy by buffering the challenges of teaching while also implementing multiple reforms. When teachers feel safe and know they can depend on the principal to be benevolent, honest, open, reliable, and competent, they are more likely to develop positive social networks and the self-efficacy required to teach effectively and to remain in the profession.

Additional research is needed to understand the perspectives of

principals at high-trust schools. Understanding how and why they create structures that influence school climate in relationship to trust may provide insight into how to best develop and support leaders. Further research might include replication of this study in high-trust school environments and the effects of high-trust environments on student achievement in longitudinal studies. Leveraging learning from the perspectives of teachers and leaders, researchers, and practitioners can collaborate in developing and evaluating the effectiveness of trust-related professional learning for educational leaders. Facilitating learning about trust and how it can be used is an important first step.

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Debra Bukko is an associate professor at California State University, Stanislaus.

Kimy Liu is an associate professor at California State University, Stanislaus.

Anthony H. Johnson is an associate professor at California State University, Stanislaus.

ROLL CALL IN DATA TEAM MEETINGS: ARE PRINCIPALS PRESENT?

With the proliferation of information on how to use data to inform instruction for more than two decades, district leaders, principals, and other stakeholders assume teachers know how to use the cycle of inquiry process to improve student achievement. This case study is an examination of the practice of data use in seven schools in one urban school district. The emergent themes of the study affirmed previous findings from the research such as teams' lack of time to use data, agendas to guide meetings, and norms to help keep teams on task. Other findings from this study revealed teams' lack of knowledge about the inquiry process, inconsistency of coaches' skills in facilitating meetings, the absence of principals, and not putting data at the center created a compelling argument for routinely monitoring or observing teams' data practice. Principals observing teams will inform them of processes in need of improvement, reveal the need for professional learning, and lead to improved processes to support student achievement.

Introduction

Since the early 2000s, educational reformers assume educators are using student data to reflect on what students should know compared to what they actually know (Hamilton, Halverson, Jackson, Mandinach, Supovitz, & Wayman, 2009; Mandinach, Honey, & Light, 2006; Wohlstetter, Datnow, & Park, 2008). Reportedly, using data systematically (referred to as data use, data-driven instruction, or the practice of data use) helps educators decipher parts of the lessons that students struggle with, identify potential causes, and consider possible solutions to remedy students' learning problems. Additionally, utilizing data aids educators in determining professional development needed to help them reteach lessons or improve content and pedagogical skills (Butler & Schnellert, 2012; Dunn, Airola, & Garrison, 2013; Ezzani, 2015; Farrell, 2015; Grigg, Kelly, Gamoran, & Borman, 2012; Jimerson & Wayman, 2015; Kuijpers, Houtveen, & Wubbels, 2010; Nunnaley, 2013). Though this practice is decades old, research reflects that educators continue to grapple with the data use process, lack the skills to use the process, and have limited time to perform the practice (Datnow & Hubbard, 2015; Jimerson & Wayman, 2015; Young, 2006). Yet, to close the learning gap for many students, the practice of data use, if employed with faithfulness, has the potential to close the learning gaps for children.

There remains the need for more robust studies that uncover what routinely occurs in data team meetings to spur continuous improvement with the process. In this study, the observation of seven urban public schools' data teams in a large Midwestern school district helped reveal what these teams do during the time set aside for data use practice. Observing the teams affords instructional leaders the opportunity to see what occurs compared to what they aspire to happen. Arguably if school leaders routinely observed teachers' data team meetings like they observe teachers' pedagogy in classrooms, they would learn what processes teachers need help with and support decision making. The research questions for this study were as follows: In what ways, if any, do educators use an inquiry framework to engage in the practice of data use to improve student achievement? What phase of the inquiry framework has the most impact on helping educators reach their desired outcomes? How do educators adjust the inquiry process if they conclude it is not helping them?

Theoretical Framework

Two well established educational processes that bolster the practice of data driven instruction are the inquiry process and professional development or professional learning (two terms used interchangeably in this paper). Each of these processes are firmly rooted in education today and are important processes that shape the implementation, evaluation, and effectiveness of the practice of data use. The adapted inquiry cycle developed for data driven instruction in the 1990s, is the process data teams use to examine student data to improve learning. Professional development, which gained a lot of momentum in the 1980s, supports the development of educators' pedagogical skills.

Professional Learning

Professional learning is essential for deepening teachers' content knowledge and developing their teaching practice. In the 1980s through the early 2000s, Joyce and Showers' (1982; 2002) framework which includes four components (i.e., rationale, model, practice, and feedback) supported building teachers' capacity by increasing students' retention rate. The components of the framework influence learning through: (a) rationale providing a sense of purpose, (b) modeling and demonstrating the skill, (c) allowing the learner to practice, and (d) feedback providing two-way communications between teacher and observer. Additionally, research revealed the importance of participants' involvement in pre-planning for professional development such as providing input into the planning and development of the training (Guskey, 2002; Yendol-Silva & Dana, 2004). Throughout the decade, there were many studies on professional development in public schools including the seminal study that re-

vealed five key characteristics of effective professional development (Garet, Porter, Desimone, Birman, & Yoon, 2001). The features were content focused, collaborative, intensive, coherent, and involved active learning (Garet et al., 2001; Guskey & Yoon, 2009; Honigsfeld & Dove, 2012). Studies using the framework revealed how it provides a process to engage teachers deeply in their practice (Butler & Schnellert, 2012; Kuijpers et al., 2010; Grigg et al., 2012).

Reevaluating the process in 2015, Desimone and Garet (2015) found multiple challenges to the five characteristics of professional development. They uncovered (a) inherent complexities of improving educators' content knowledge, (b) the need for differentiating teachers' professional development, (c) the necessity for interrelating the professional development and lessons, (d) the challenges of urban environments (e.g., mobility of urban teachers and students), and (e) the requisite for leaders to facilitate the implementing of professional development. As the practice of data use became more commonplace in schools, studies examining professional development in support of data use revealed teachers needed more input into what comprised professional development, additional time for the practice, and support implementing the practice (Jimerson & Wayman, 2015). Professional development was used in this study borrowed from Joyce and Showers (2002) model for providing a rationale of what the practice should look like. Additionally, components of the Desimone et al. (2009) process used in the study focused on elements the data teams identified as the team's weakness, team collaboration in reviewing the process, and active learning. Last, the professional development in the study also included input from the participants (Guskey, 2002; Jimerson & Wayman, 2015; Marsh, Farrell, & Bertrand, 2016).

Inquiry Cycle

In the late 1990s and early 2000s the inquiry cycle and professional learning helped practitioners study how to analyze students' performance data and use their findings to inform instruction (Bernhardt, 2005; Hamilton et al., 2009; Mandinach et al., 2006). That is, as professional development in schools increased, training content specific to the inquiry cycle grew. Mandinach and Gummer (2016) define the inquiry cycle as a process to define the problem, use data in support of the problem, transform data into information, use the information to make decisions, and evaluate the outcome. Many variations of the framework exist (Bocala, Henry, Mundry, & Morgan, 2014; Lipton & Wellman, 2012; Nunnaley, 2013) with most including a minimum of three phases (i.e., gather, analyze, and organize data). For example, in a three-step process, first, teachers purposefully gather student data in support of a defined problem (e.g., students' coursework or end-of-year state assessments). Second, as it relates to the problem, teachers analyze the data to gain an understanding

of what students are or are not learning and why. Third, teachers make decisions about their pedagogy based on their findings and monitor their progress. The three-step inquiry cycle was useful in this study because it is a simplified version of the many models available to educators. During 2005 through 2008, the groundswell of research on managing data facilitated school districts making students' performance data more accessible and user-friendly for teachers (Wohlstetter et al., 2008). There are studies about how the process is working in school districts with findings from many studies based on self-reporting data from teachers and administrators (Dunn et al., 2013; Ezzani, 2015; Farrell, 2015; Jimerson & Wayman, 2015).

The confluence of the two processes—inquiry cycle framework and professional development anchor this study. These processes are well-researched and deployed throughout school districts across the nation, making them key to this practice. The inquiry cycle framework was the lens used to observe teachers' and administrators' data practice in the schools while professional development served as the intervention to build teachers' capacity in the process. Participants held routine data team meetings, completed a survey and recommended teams' weaknesses they wanted to strengthen, studied elements of the characteristics of a collaborative team, implemented the examined characteristics into their process (some were more deliberate than others), and ultimately reflected on their learning experience. The following paragraphs elaborate on each process as it relates to its usage in the study.

The inquiry cycle used in this study helped determine if the teams were previewing or collecting data (e.g., students' tasks or tests), analyzing them, or organizing data to identify what to teach or reteach. As explained previously, there are numerous inquiry models; however, in this study, Lipton's and Wellman's (2012) three-phase process informed the field observations because of its ease of use. See figure 1.

Observed teachers not using the process with fidelity, required the use of professional development on the inquiry model. It was used to help build the participants' capacity for the inquiry cycle. To ensure the effectiveness of the study's intervention the use of professional development was grounded in research-based best practices such as content focused, collaborative, intensive, coherent, and involved active learning (Garet et al., 2001; Guskey & Yoon, 2009; Honigsfeld & Dove, 2012). The grounding of professional development in these areas meant focusing the content on the area the team felt needed the most support.

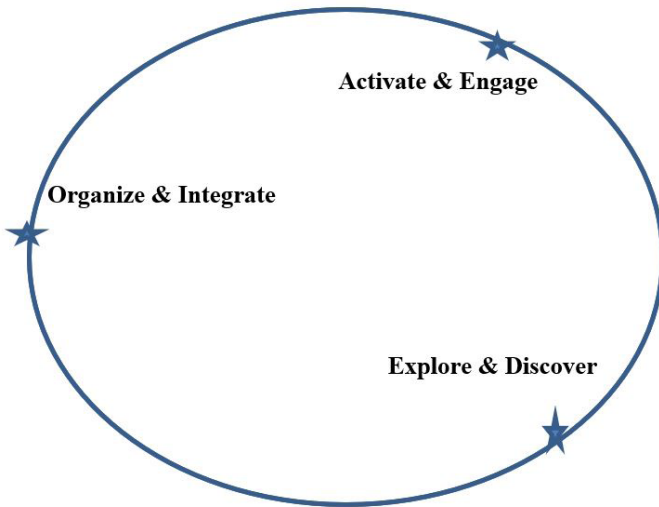
Methodology

In this case study (Miles & Huberman, 1994; Saldaña & Omasta, 2018) the examination of seven data teams comprised teachers, instructional coaches, and principals in six elementary and a middle school in one urban district in the Midwest. The multiple schools encompass a case

because they are part of one urban school district. This is consistent with Merriam's and Tisdell's (2016) description of a case study, "the single most defining characteristic of case study research lies in delimiting the object of study: the case (p. 38)." Additional rationale that supports this case is its boundedness due to the finite number of educators interviewed for the study (Merriam & Tisdell, 2016; Saldaña & Omasta, 2018).

Figure 1

Lipton and Wellman (2012) Collaborative Learning Cycle



Adapted from "Collaborative Learning Cycle" by Lipton and Wellman, 2012, *Got Data? Now What?*, p. 26. Copyright 2012 by the Solution Tree Press.

The study consisted of the participants attending seven data team meetings. In the first meeting, the data teams learned about the process, asked questions, and completed a pre-survey about their current data practice. In the second and third data team meetings, note taking of the teams' interactions helped document their behaviors during routine meetings. As previously mentioned, the Lipton's and Wellman's (2012) inquiry cycle was the lens used to help determine where on the cycle was the teams' discussions situated. For example, they were problem finding, analyzing, or testing theories. Additionally, Lipton's and Wellman's seven characteristics of collaboration helped identify the team members' collaborative behaviors. For example, the team: (a) maintained a clear focus, (b) embraced a spirit of inquiry, (c) put data to the center, (d) honored commitments to learners and learning, (e) cultivated relational trust, (f) sought equity, and (g) assumed collective responsibility (Lipton & Wellman, 2012). At the end of the third meeting the team members completed a written survey

to identify collaborative behaviors they presumed were weaknesses and wanted to mediate with professional learning. During the fourth meeting the participants received feedback on the professional development topic the team members selected. During the fifth meeting, participants received said development and in the sixth and seventh meetings, the participants attempted to incorporate what they learned into their practice. At the end of the seventh meeting, teachers and coaches responded to a questionnaire about their experience. In all, teachers, coaches, and principals from each participating data team completed a pre-survey (first meeting), a professional development survey (third meeting), and reflected on their experience (seventh meeting). Instead of reflecting on their experience in a group setting, principals received a one-on-one interview separate from the team. Finally, field notes from four observations (second, third, sixth, and seventh) of the data team meetings at seven schools resulted in twenty-eight sets of notes.

Participants

The participants included members of the data teams from seven schools consisting of a coach as facilitator, grade-level and content teams in six elementary schools, and one middle school, and the principals. The principals arbitrarily selected the teams that participated in the study. The demographics of the teachers in the study were similar to the national demographics of teachers with white women teachers representing the majority. Women also represented the majority of coaches, and the races were almost evenly split between white and African Americans. Last, principals comprised the most diverse group with one African American male, one Latinx female, one white female, and four African American females. All the teams had a mix of teachers who were either first-year or had three or more years of experience teaching. Since a district requirement for coaches was literacy certification, all were experienced educators. Finally, though principals were members of the data teams, only one elementary school principal routinely attended her school's data team meetings, while another elementary school principal attended half of the meetings and the others attended one or none.

Data Collection and Analysis

Primary data sources included two sets of hand-written field notes from the observations of four data team meetings at each school. Each participant completed pre-surveys at the first meeting to help explain the current processes of the data teams. Participants also completed surveys to determine what aspects of their teams' collaborative behaviors they wanted to intervene with professional development. The participants reflected

on their experience and shared their feedback in a questionnaire during the seventh meeting. Finally, separate interviews were conducted with principals at the end of the study which gave them an opportunity to reflect on the process and extend the interview if necessary. Secondary data included Lipton's and Wellman's (2012) inquiry cycle and characteristics of data teams. Additional secondary data included articles about the use of data in P-12 public schools, professional development, and the inquiry cycle.

Findings

Using the inquiry cycle as a lens during observations helped identify where in the process the participants' discussions resided. It also was a lens for survey participants to examine their own practice and determine their strengths or weaknesses. For example, the circular shape of the inquiry cycle signifies to end users data dialogues are continuous. Facilitators adhering to the process in the first phase might raise questions to encourage teachers to explore problems or make assumptions about students' performance. In the second phase, the facilitator and teachers analyzing students' work involves them looking for patterns to identify students' thinking and what occurred during their teaching. This part of the process also helps the facilitator and teachers uncover how they are contributing to the problem and in the third phase they can consider what they would do differently or what professional development they need. Also, in the last phase they are generating theories and exploring solutions to resolve students' learning problem(s). This cyclical process is ongoing because once the identified problem is resolved, educators continue to use the process to solve other areas of concern.

Several themes emerged from the examination of the survey and observation data documenting the facilitators' and teachers' use of the inquiry cycle. First, facilitators, who lacked expertise using the inquiry cycle, conducted data team meetings that resulted in random conversations because they did not situate the conversations in a specific phase of the cycle. Second, facilitators who lacked or had some expertise using the inquiry cycle ceded the facilitator role to attending principals who were experts using the cycle. These facilitators started with an agenda and if the meeting derailed, they redirected and put the conversation back on course. For example, if the team was analyzing students' work, some teachers would report only scores on an assessment; subsequently, a principal would interject and ask the teacher about patterns found in the students' assessments. Third, facilitators, experts with the inquiry cycle, conducted coherent data team meetings aligned with the cycle. They situated the conversation in a specific phase of the cycle and guided the conversation that kept teachers on task. For instance, after thoroughly analyzing the data, the facilitator would shift to considering research-based strategies to improve students' learning, signaling to the team they were moving to the third phase. Ad-

ditionally, teachers' responses to surveys administered prior to the observations illustrated their readiness to use data and were analogous to the findings of the observations of their practice. Of the seven district schools, four facilitators were in the first category, two in the second, and one in the third. The use of pseudonyms assigned to the district schools helped differentiate the examples cited.

In addition to the themes, four key findings from the observations included most teams did not adhere to a universal cycle of inquiry process, remained on task with expert facilitators, lacked the principals' participation, and agreed they needed to put data at the center. Furthermore, the teams used Lipton's and Wellman's (2012) scaled group inventory to self-assess their readiness to use data by identifying the groups' strengths and limitations. Finally, they selected professional development to remediate their weaknesses.

Lack of Fidelity to Inquiry Cycle Process

The first finding, teachers' lack of fidelity to the process resulted in disjointed team discussions during the data team meetings at most of the district schools. This finding is important because the research indicates that teachers have a finite amount of time to meet and discuss students' progress (Young, 2006). Therefore, processes that foster coherent dialogues about students' academic performance are necessary if teachers are to continually improve learning for all children. One example of disjointed dialogue in a district data team meeting involved the South Elementary School coach or facilitator, who commenced the team meeting with the intent of having teachers analyze students' recent district assessments—phase two of the inquiry cycle. Though the facilitator was somewhat knowledgeable about the inquiry cycle, she was unable to keep the teachers on task because she did not redirect the teachers back to the planned agenda when one teacher kept getting off topic.

In the second phase, teachers theoretically examine the tests and look for patterns; however, Janet, one of the two teachers attending the meeting, commandeered the conversation when she started complaining about the math curriculum. The principal at South was not present nor did she attend any of the observed meetings; therefore, the coach had to navigate difficult discussions, like this one, alone. To illustrate the point, instead of redirecting the conversation back to the task of analyzing the assessments, the coach proceeded to say she was advised to share a video with them. Janet responded, "...can't see the full video for the curriculum...asked about iPads." When asked if the teachers were on schedule in math, Janet stated, "We are okay with time, but we don't have time to do groups." When asked about centers she responded, "iPads make it easier."

Next, the coach inquired about the teachers' review of the recent reading assessments. Instead of a student-centered approach like using an

inquiry process to help students think aloud about their performance on the assessment, Janet promptly stated she made goals for the students, told them what they needed to do, and sent the assessments home with them. The actions did little to bolster students' ownership of their learning (Marsh, Farrell, & Bertrand, 2016). The team's scattered approach in the meeting resulted in missed opportunities to examine students' performance on the assessments which was the purpose of the meeting.

Teams' Remained on Task with Expert Facilitators

The second finding revealed that the teams' remained focused and on task when coaches were adept in using the inquiry process or the data driven instructional coaching model and prepared to facilitate meetings with complete agendas (Desimone & Pak, 2017; Glover, 2017; Glover, Reddy, Kurz, & Elliott, 2019; Joyce & Showers, 1982; Marsh, Bertrand, & Huguet, 2015). With the exception of three district schools where one school had an expert facilitator and two schools had facilitators with expert principals, the other facilitators and teachers who lacked the knowledge and support had fruitless meetings. One instance of this was the data team at West Elementary School where the principal rarely missed meetings, the teachers arrived on time with their required notes and assessments to discuss, and the coach had a prepared agenda. Teachers respected the purpose and time of these meetings. Though the skills of the coach at West were subpar compared to the principal's skills, she started the meeting on time with an agenda and facilitated the meetings with the support of the principal. The discussions were usually about the teachers' analyses of students' assessments they completed prior to the meetings. They used forms to show students' performance status of a particular skill, then proposed developmental activities to help students who were not performing at their grade level. Teachers' dialogues were mostly situated in the second phase—analyzing and on the verge of the third phase; however, these discussions were not always fluid because most of the teachers struggled with identifying research-based strategies for students.

During these times, the principal frequently prompted teachers to think aloud about possible strategies. She challenged them to think about reading or math strategies while at the same time inquiring about students' social and emotional well-being. To illustrate the point, Ms. Sands, one of the primary teachers said, "Students struggled with the letter sound recognition assessment and differentiating but the good news is number writing." She went on to say how many students did well as the second teacher, Mr. Thompson, asked if any students turned the numbers around. When Ms. Sands said yes, the principal asked, "Who were those students?" After she named them, the principal promptly replied, "Are parents getting letters of concern?" Ms. Sands answered, "If they come in today (referring to the school's scheduled parent meetings) or tomorrow, if not I'll send it

home.” The principal then turned her questioning away from Ms. Sands to Mr. Thompson and the other teacher. It was typical for her to use probing questions to nudge teachers to consider next steps once they completed their analyses because the coach did not always follow-up after teachers reported their findings.

Another example of how the district’s expert or somewhat expert facilitators use of the inquiry cycle supported coherent meetings involved the coach from North Elementary School who was always prepared and promptly started the meetings on time in her classroom. Looking around the classroom, there were visible signs of students’ progress illustrated by colors such as red, yellow, and green often seen in schools. The coach convened the meeting as one teacher commenced talking about a student’s behavior. Subsequently, the coach reminded them of the team’s norms and signaled the start of the meeting by asking the teachers, “What are some positive things that happened this week?” One teacher spoke about students selecting books to read while the other spoke of students’ excitement when learning about the solar system. The coach adeptly stated, “Let’s talk about your reflections using data.” At this point the principal entered the meeting late and never engaged, and this was the only meeting she would attend. With the discussion underway the teacher, who broached students’ reading selections, said she did not know how to move students forward. It is important to note that exposing her vulnerability in the presence of her principal and coach revealed the trust between the educators. The coach supported her by telling her to speak about students individually and when she mentioned one student the coach said, “What I noticed about her in tutoring is that she likes to rush through everything.” The discussions remained focused as both teachers talked about students, their progress, and what they were doing to add to the students’ problems. Towards the end of the meeting the coach suggested they look at another data set to determine patterns. North’s skilled coach intuitively used the inquiry cycle to keep everyone focused on the data as the teachers spoke freely about students’ progress and were open to learn from the process. Her behaviors prevented the teachers from rushing to a solution prior to them fully understanding the problem.

Conversely, the district’s coaches who lacked skills using the inquiry cycle, commenced meetings with sparse or no agendas, rarely enforced norms, usually had late comers to the meetings unprepared to discuss students’ progress or team members that hijacked the conversation. Unfortunately, this behavior occurred at many of the observed teams at the district’s elementary schools South, James, Polk, Banneker, and Valley Middle School. For example, a data team meeting at James Elementary School illustrated the lack of preparedness for a planned meeting when someone from the office had to call over the public address system to the teachers’ classrooms to inform them of the meeting. Banneker’s coach lacked the skills required to facilitate the meetings and, though her prin-

principal had the expertise, she did not attend every meeting to support her. South was another district school where the coach lacked the expertise using the inquiry cycle. Though she usually prepared an agenda and started the meetings as scheduled, she did not establish norms; therefore, the teachers seldom arrived on time and when they did, they got off task and the facilitator ultimately succumbed and stopped redirecting the discussion. For example, once after she reviewed the agenda with teachers, two of them got off topic and started talking about students' assessments and one said, "I got dinged on my evaluation..." while her colleague asked, "How was it your fault?" The coach said, "Let's get back on course." The teachers then started talking about the passing percent of the students' assessment, how high the percentage was, the difficulty on students taking the assessment online, and how students did not understand the test. One teacher said students were doing well in her class although their performance on the test showed otherwise. The facilitator stopped redirecting the dialogue, and it morphed into conversations about the curriculum. The team's scattered discussion never stayed on one topic long enough for them to explore the causes of students' performances.

Teams Lacked Principals' Participation

The third finding, the absence of principals in these data team meetings, was noticeable. Out of the seven district schools that participated in the study only the principal at West routinely attended and was an active participant. As an experienced leader, accomplished elementary school teacher, and literacy expert, West's principal could easily identify students' deficiencies and recommend research-based strategies for teachers once they described students' weaknesses in reading. Though she asked the teachers many questions, she occasionally interjected humor and often assured them that her questioning was not a criticism of their work but support of their learning. The other district leader, Banneker's principal, randomly attended team meetings and, when she did, the coach who was unfamiliar with the inquiry process, acquiesced to her leadership. Sitting with the coach before a meeting, she stated she felt inadequate with the practice; therefore, it was understandable why she yielded the role of facilitator to the principal. The Banneker's principal's tone was different from her colleague at West; it was firmer and could be interpreted as harsh sometimes. She only attended some meetings and would interject comments at times that veered the team off course. On the other hand, principals from the district's North Elementary School and Valley Middle School attended one team meeting but never engaged with the teams. The principals from the remaining elementary schools, James, Polk, and South never attended the meetings.

The district's leaders adept at using the inquiry cycle, like the principal at West or the coach at North, were able to engage teachers in

examining students' coursework and assessments because of their readiness skills to use data as defined by Lipton's and Wellman's (2012) scaled group inventory. Focusing on the data and remaining on task, the teams also had coherent discussions about possible causes for students' performances, and it was clear what phase of the inquiry cycle the discussions resided. Using cognitive coaching as a vehicle to mediate teachers thinking, West's principal and North's coach helped teachers by questioning them throughout the meetings as well as pausing or paraphrasing their thinking out loud which enabled teachers to reflect. This usually led to positive outcomes for the meetings such as maintaining focus on the data or keeping data at the center of the work (Lipton & Wellman, 2012). In addition to the leaders using coaching tools to facilitate teacher self-directed learning, there was a high degree of trust in these two data teams as evidenced by teachers' willingness to be vulnerable in the presence of the principals or experimenting without fear of reprisal. In contrast, if principals were absent and coaches were unskilled at guiding discussions using the inquiry cycle, the teams, if also untrained at using the model, usually were unable to follow the process that leads to understanding students' performance.

Teams Needed to Put Data in the Center

After the initial observations, participants responded to Lipton's and Wellman's (2012) scaled group inventory, a survey that illustrates a teams' readiness to use data. Each member evaluated the team's readiness to conduct data team meetings, selected several characteristics they presumed were weaknesses of the team, and ultimately selected one to learn about in professional development training. The inventory encompassed seven essential qualities for developing a culture of inquiry which includes (a) maintain a clear focus, (b) embrace a spirit of inquiry, (c) put data at the center, (d) honor commitments to learners and learning, (e) cultivate relational trust, (f) seek equity, and (g) assume collective responsibility (Lipton & Wellman, 2012, p. 11). The above survey's seven characteristics each had three questions. Each participant received the survey results and discussed the team's selections at the fourth meeting. See figure 2. Six out of seven schools selected "put data at the center" as the skill they wanted to study in their professional development training; there was a three-way tie for the skills—maintain a clear focus, embrace a spirit of inquiry, and honor commitment to learners and learning. Lipton and Wellman (2012) stated teams that put data at the center, "... are assessment literate. They keep data central to the conversation, seeking out and using multiple sources and multiple types to inform their choices and plans" (p. 13). Since the majority of the district's data teams selected this topic, it was apparent to them like it was to the observers that they needed help using structures to facilitate data conversations. During the fifth meeting, data teams received professional development on the inquiry cycle and analyz-

ing data. After the professional development, the participants attempted to model in their last two meetings what they learned in the training.

Discussion

In response to the first research question, (i.e. do educators' use an inquiry framework to engage in the practice of data use?) the observations echoed what is currently in the research literature: teachers' use of data varies and is contingent upon professional development received as pre-service teachers or on-the-job training (Mandinach & Gummer, 2016), and the presence of principals or trained coaches to keep meetings on track is essential to success. The study revealed one distinction, the lack of monitoring of data teams' practice. Teams do not receive feedback on aspects of the practice that are beneficial to promoting student achievement nor input on problematic facets of their practice. For example, the Banneker coach, who revealed her lack of knowledge about the inquiry process in private illustrated the lack of trust between the coach and the principal. Her resistance to being vulnerable and exposing her lack of knowledge about the inquiry process to the principal revealed a lack of relational trust. As a result, she was unable to lead discussions about students' learning using an inquiry cycle typically as instructional coaches should be able to do. The principal's habit of taking over the role as facilitator, when she attended the meetings, further illustrated how the coach could perceive the principal's behaviors as disrespectful or lacking confidence in her skills.

If the district observed data teams similar to how they observe students' learning, data teams could receive feedback on how their actions were leading to or stagnating student achievement. Observers of the Banneker's data team would document what they witnessed, analyze their findings, and likely contend they noticed the team spoke freely when the coach facilitated the meeting, indicating a trusting environment. However, observers would find the opposite when the principal facilitated because she directed teachers instead of using open-ended questions to engage them. According to Bryk and Schneider (2002) when relational trust is part of the fabric of a school, it facilitates accountability; therefore, it is essential for encouraging collaboration. Illustrations of trust in meetings consist of members actively listening to one another, supporting each other encounter new learning, and allowing people to experiment without penalties (Bryk & Schneider, 2002). Though lack of trust was observed in two of the seven district schools, most of the teams exhibited characteristics of relational trust. It was not surprising that only one data team viewed relational trust as one of its weaknesses and that team is the one where trust was prevalent.

The second question, what phase of the inquiry framework was most helpful to educators reaching their desired outcomes? This study revealed that most of the data teams did not use an inquiry model and those

that did situated their discussion in phase two, analyzing data. Figure 2 demonstrates that, although the teams' behaviors fit into phase two, most of the behaviors fell short of meaningful tasks usually performed in this phase. For instance, teachers who are adept at using data are looking for patterns in students' work in search of clues to identify their thinking and rationale for decisions. They also try to discover the students' readiness for the lesson and examine their pedagogy to determine if they contributed to the problem(s). Furthermore, teachers look for the root causes of the students' learning problems because they want to make certain they are solving the correct problem(s).

Figure 2

Data Teams' Inquiry Processes During Study

School	James	Polk	West	North	South	Banneker	Valley
Inquiry phase status during the initial observations*							
Activating & engaging	NO	NO	NO	NO	NO	NO	NO
Exploring & discovering	NM	PM	M	M	NM	PM	NM
Organizing & integrating			PM				
Characteristics on scaled group inventory**							
Maintain a clear focus				X	X	X	
Embrace a spirit of inquiry	X		X	X			
Put data at the center	X	X	X	X		X	X
Honor commitment to learners	X			X	X		
cultivate relational trust				X			
Seek equity							
Assume collective responsibility		X				X	

Using Lipton's & Wellman's (2012) model, *the following letters (e.g., M=Met; PM=Partially Met; NM=Not Met; NO=Not Observed) situates the data teams' discussion during most of the study; ** The "x" denotes the characteristics defined by Lipton & Wellman (2012), selected for study by the data teams. Adapted from "Got Data? Now What?" by Lipton and Wellman, 2012, Got Data? Now What? Copyright 2012 by the Solution Tree Press.

The first two observations of the districts' data teams showed little evidence that the data teams performed at the previously stated level. Only two elementary schools, North and West were on the verge of analyzing work in phase two; yet they remained a distance from mining data to get to the root cause. For example, when North's team compared their thinking about the inquiry process before and after the professional development, their comments aligned with the descriptions of the first two observations. Prior to the training, two of the four members of the team thought their discussions about student data did not inform instruction while the other two strongly believed that it did. Their comments after the study were also evenly split; one half liked the current process while the other half saw benefits to mining data to uncover students' learning problems. West's teams also agreed with the descriptions of the first two observations that the teachers relied on the coach's skills. However, after the professional development, they said the process allowed them to reflect on their pedagogy, and it helped them examine how students learn.

During the other schools' first two observations, the teams talked about the complexity of the assessments, the deficits of students, shortcomings of the curriculum, and unrealistic expectations placed upon them. When some teams discussed the results, the conversations rarely penetrated below the surface. It was not surprising that some of the teams struggled to name research-based strategies because, except for a couple of coaches, most of them did not use the inquiry process to facilitate data dialogs. Instead, they provided teams with copies of assessments, asked them to look at the tests, and solicited team members' opinions about the students' results. After the professional learning, some data team members shared positive comments. For example, someone appreciated the questioning technique to help them deeply examine the data in search of students' learning problems while another person commented, "We need to do a lot more [sic] we are not doing a very good job at all." After the training, participants at James, Polk, and Banneker Elementary Schools and Valley Middle School viewed the professional development as beneficial while about a third continued to view the process as a way to help students' test performance.

The following outcomes inform the third question, do educators adjust their process (inquiry cycle) if it is not helping them improve student achievement? One of the findings from this study illustrated that teachers did not use the cycle of inquiry; consequently, the teams did not make adjustments. Nevertheless, after the teams received training, some of the data teams attempted to model their learning in team meetings during the last two observations of the study. For example, West's teachers wanted training on putting data at the center because, like many data teams, the teachers were quick to throw a solution at a problem not fully developed. Therefore, the team learned to use a protocol to assist them in getting to the root cause of students' problems. The protocol forced them to continue

to question the problem until they exhausted all possibilities. Ms. Sands, one of the first West team members to embrace the protocol, used it with some success, which encouraged others to try it.

Most of the principals' interviews indicated that they were cognizant of the need for professional development on the inquiry process for teachers. The principals at the elementary schools all commented on the need for primary school teachers to learn about the process. Since elementary teachers in grades three through six administer the state assessments to their students, they are more familiar with the process. Additionally, principals mentioned that when teachers get stuck using data, they do not know the next steps to take. This was likely the reason why most teams remained in phase two because of their unfamiliarity with the inquiry cycle. One principal summed up her thinking by stating, "There should be no learning task that's not related to some sort of data. I think holistically, you need to look at the whole student and make decisions based on the data from many different sources." In the end, some schools benefitted, and others did not.

Conclusions

Though the practice of data use to inform instruction has been in place over two decades, vast opportunities to improve remain. Observing the practice in seven schools exposed the teams' start times of the meetings, coaches' facilitation skills, content discussed, processes used, participants' involvement, teams' collaboration, the focus on data, use of professional development, and the attendance of the principal. Observing the nonexistence of processes used to facilitate data dialogs, the inconsistency of coaches' skills and the absence of principals in meetings signaled a need for district and school leaders to monitor data teams' practice, similar to how they observe teachers' pedagogy. We know teachers are closer to the students than other faculty and their teaching methods matter. The same is true for data teams—how they talk about students' performance, find and solve students' learning problems, and hone their pedagogical skills with professional development matters. Data teams are the venue for where these tasks should occur; therefore, principals need to be present. They need to be willing participants in data team meetings and, at times, the observer so they can discern when the skills of a coach need improvement, when teachers lack the knowledge of an inquiry process and can differentiate the training according to the teachers' needs, and help teams delve deeper in the data to find the right problems to solve. Principals' leadership in data team meetings is crucial.

One of the limitations of this study was the abbreviated professional development. Research shows participants need ongoing professional development to be effective; therefore, one recommendation is to provide longer professional development when replicating the study. An-

other recommendation is to conduct similar studies to inspect how educators use the time allocated to examine students' performance on class assignments or assessments. If there is a pattern of underperforming data teams, acknowledging the problem, and implementing widespread monitoring practices will bolster schools in their efforts to improve student achievement. If left unchecked, there may be more underdeveloped practice in need of support whereas monitoring data teams will likely reveal how to improve the practice and subsequently student achievement.

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Vanessa Garry is an assistant professor at the University of Missouri -St. Louis

THE PRINCIPAL AND THE SCHOOL NURSE: CONDITIONS AND CONCEPTUAL MODEL FOR BUILDING A SUCCESSFUL AND VITAL PROFESSIONAL RELATIONSHIP

Of the myriad responsibilities of the building principal, the most recognized and critical activity is overseeing and ensuring student success in the classroom. Considering the diverse population of professionals that building principals have under their supervision that directly impact students' classroom learning, the authors posit that a critical and unrecognized contributor to educational achievement and success is the school nurse. The vital importance of the school nurse's role in students' classroom success can be found in the U.S. Department of Health and Human Services fundamental statement, "health is a foundational aspect of children's ability to develop, learn, and thrive" in the classroom. Therefore, in cooperation with a building principal's leadership, the formation of a mutualistic, trusting, professional, and visible relationship with the school nurse is vital in laying a foundation for successful student learning outcomes. Furthermore, the importance and criticality of a successful principal-school nurse relationship is supported in the tenets, directly or indirectly, found in "Whole Child" research and the "Every Student Succeeds Act." Finally, this vital relationship is found to be even more crucial during this period of the COVID-19 pandemic.

Keywords: building administrator leadership, school nurse, academic achievement

The principal has the ultimate responsibility and accountability for the school (Wallace Foundation, 2013) and student educational success is the primary concern of administrators (Cisler & Bruce, 2013). The principal and classroom teachers together have the greatest influence on student educational success. In order to achieve and optimize student classroom success, the principal requires support beyond that provided by teachers and educational support staff. In other words, student success requires a multidisciplinary team. For example, student success in the classroom demands an array of professionals including teacher assistants, related service providers, library staff, and assistant administrators. But there is a key staff member who is imperative to the multidisciplinary team and is often overlooked—the school's registered nurse. Of all the employees who have direct roles in students' classroom success, the member that the principal has the least professional familiarity with and knowledge about is the school nurse (Davis, 2017). This lack of familiarity can create a supervisory challenge from which a natural relationship chasm

can form. This natural chasm can, in turn, negatively impact student performance and classroom outcomes. A lack of familiarity with nursing and the school nurse's role is largely due to the principal's professional background. They most likely were educators and progressed through the teaching ranks (Davis & Lynch, 2018). An additional factor driving this unfamiliarity is the principal's graduate and continuing education activities where little-to-no emphasis is placed on details of the school nurse's role, its importance to the learning environment, and strategies for professional collaboration. Now, facing the COVID-19 pandemic, the school nurse's role may no longer be relegated to a low-profile position in school operations. Given the need to understand the school nurse's role, Davis and Lynch (2018) posited that the principal's lack of familiarity and knowledge chasm can and must be bridged and the relationship optimized in order to maximize students' educational success.

It is the purpose of this paper to share the development and implementation of a simple working relationship model designed through the lens of the principal. The purpose is to create a collaborative relationship that prioritizes student health and readiness for classroom work under all manner of circumstances, meeting the health and safety needs of children and youth in ordinary circumstances and addressing health crises that prompt schools to use the nurse's expertise to plan a safe and effective learning environment.

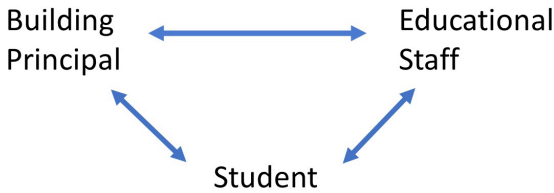
Building a Mutualistic Principal-School Nurse Relationship to Optimize Student Outcomes

The Principal

We accept that the principal is charged with the responsibility and accountability for all activities and outcomes associated with a school. These activities and outcomes are varied and diverse, but, by far, the primary responsibility is the educational achievement of students. Habegger (2008) contends that a principal's key responsibilities are creating and sustaining a high-achieving educational setting. Further, he identifies three essential elements for creating high-achieving learning environments: students, educational staff, and community. Similarly, The Wallace Foundation (2013) identifies five key responsibilities for principals: 1) shaping an academic vision for students; 2) creating an education-focused climate; 3) nurturing leadership growth in educational staff; 4) relentless commitment to instructional improvement; and 5) successful management of educational staff, processes and data. The commonalities between Habegger and The Wallace Foundation's criteria and those identified by Marzano, Waters, and McNulty (2005) are clear and demonstrate the primary, first-order triumvirate relationship model for primary and secondary educational settings comprised of the principal, educational staff, and students, illustrated in Figure 1.

Figure 1

First-Order Triumvirate Relationship Model in Primary and Secondary Educational Settings



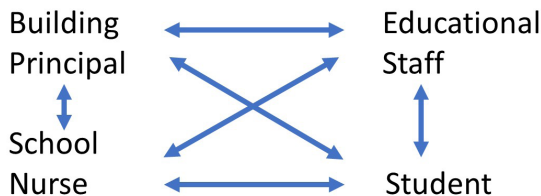
This first-order, triumvirate relationship model is not surprising and is likely the foundation on which the principal's graduate and continuing-education programs are built (Davis & Lynch, 2018). However, missing from this triumvirate relationship is the role and importance that the school nurse has in fostering students' academic success and achievement.

The School Nurse

According to the National Association of School Nurses (National Association of School Nurses, 2017), providing for and ensuring the overall health, safety, and well-being of students are the school nurses' primary objectives. Thus, it is not surprising that successful student performance in the classroom has dependencies beyond those that are identified by the triumvirate, Figure 1. In particular, the absent but pivotal player that needs to be added to the triumvirate is the school nurse. Adding the school nurse forms a new model, i.e., a first-order tetrad model of stakeholders, Figure 2.

Figure 2

First-order Tetrad Relationship Model for Primary and Secondary Educational Settings



It is this tetrad's daily activities that are key drivers for student success in the classroom and beyond. The identification and addition of the school nurse as a key stakeholder in student academic achievement is grounded in the U.S. Department of Health and Human Services' (USD-

HHS, n.d) position that the school nurse plays a critical role in students' classroom success. In particular, USDHHS states that "health is a foundational aspect of children's ability to develop, learn, and thrive in the classroom" (p. 1). Furthermore, contemporary education models such as the Whole Child (2012; 2015) research, National Association of School Nurses (2016), and the Every Student Succeeds Act (2018) embraces and acknowledges the school nurse's role in positively impacting student success by clearly arguing that good physical and mental health are integral components to successful learning outcomes. In particular, the Whole Child initiative explicitly calls out as key tenets the importance and criticality that physical and mental health plays in students' classroom success. For instance, the Whole Child initiative posits that students who have access to regular physical and mental health services have fewer absences, are more social, less likely to participate in risky behaviors, have improved focus, and higher test scores. With the school nurse's integral role on the school's educational leadership team to enhance student learning well established, let's examine some specific examples of physical and mental health services they provide to impact classroom successes:

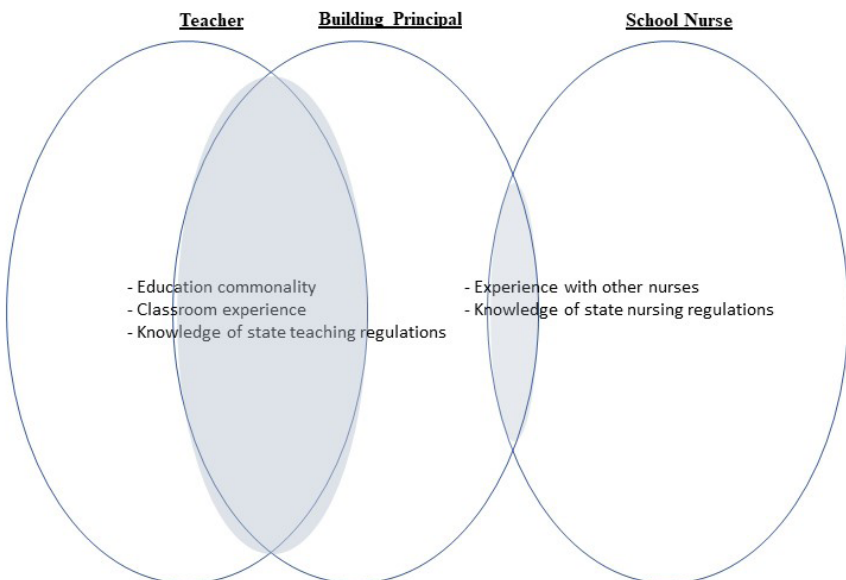
- 1) Administering required medications, as prescribed by primary care providers and specialists, to manage chronic diseases such as asthma, attention-deficit hyperactivity disorder (ADHD), and diabetes.
- 2) Addressing the spectrum of emergent health issues, from scrapes to broken bones or a presentation of strep throat.
- 3) Administering visual acuity and hearing exams and making referrals as necessary to ensure students' physical capacities are optimized.
- 4) Collaborating with teachers and social workers to address new or continuing harmful or self-destructive behaviors and make referrals as necessary to ensure students' emotional and mental health are optimized.
- 5) Creating a climate of health and safety that addresses from a healthcare perspective important issues such as chronic absenteeism, bullying and harassment.
- 6) Collaborating with community healthcare organizations, e.g., hospitals, to provide education to students and parents/guardians about physical transformation, such as puberty, so that students are knowledgeable and grounded with scientific facts to understand both physical and emotional changes they may be experiencing.
- 7) Acting as an educator and resource for parents/guardians about "all things health related" for their child. This can be an overlooked role and responsibility and one that school nurses must embrace in order to optimize the student success in and out of the classroom. For example: 1) educating and preparing female students and their parents/guardians for menarche, including eliminating the percep-

tion that it is necessary to keep her home during this or future occurrences; 2) educating and being a resource for students and their parents/guardians to address the topic of nocturnal emissions, most commonly associated with early adolescent males; and 3) as part of a healthcare team, being the spokesperson to parents/guardians seeking cognitive behavioral therapy for their child who is experiencing emotional distress.

Being a healthcare educator and resource is an especially important part of school nurses' responsibilities during the current COVID-19 pandemic. For example, one of the primary responsibilities and expectations of professional nurses is to take complicated and difficult medical practices, procedures, protocols, and action plans and clearly, succinctly, and with compassion, empathy and patience, communicate vital and necessary information to their targeted patient-audience. For school nurses the audience is students and their families. As an example, during the COVID-19 pandemic, school nurses will take information and guidance from expert sources such as The Centers for Disease Control, their state's and county's Departments of Health and use their medical acumen to help families and students navigate their district's health policies, protocols, and re-entry plans.

Figure 3

Venn Diagram Illustrating a Qualitative View of Commonality, e.g., Regarding Education, Professional Experience and Licensure Regulation for Teachers and Nurses with the Building Principal (Davis, 2017).



Principal-School Nurse Relationship

As identified earlier the principal and school nurse's professional collaboration often possesses the greatest disconnect among those who impact classroom success (Davis, 2017). Historically, an important source contributing to this professional chasm between the principal and school nurse has been qualitatively defined by Davis (2017) and is illustrated in Figure 3.

The Venn diagram illustrates the professional activity and commonality in responsibility between three key stakeholders who directly impact student readiness for educational success and achievement in the school's milieu (i.e., principals, teachers, and school nurses). The strength of this commonality between principals and teachers may be expected. The lack of commonality between principals and school nurses is equally clear. Because of professional history and the laws that govern their roles and responsibilities, principals and teachers share a high degree of commonality and knowledge in terms of their scopes of practice.

However, school nurses operate under separate and disparate practice laws and guidelines. These separate and disparate practice laws and guidelines are a source for a lack of knowledge and understanding about the roles and responsibilities of school nurses to all but the most motivated and inquisitive principals. Thus, it is not surprising to find that many principals have little, if any, familiarity with school nurses' scope of practice and health-office operations and, as a result, the day-to-day activities and longer-term impact these front-line healthcare providers play on student classroom success and achievement. This lack of familiarity can lead not only to poorer student outcomes but also workplace conflict. For example, one of the school nurse's responsibilities is to review immunization records and inform the administrator of students who are out of compliance and require intervention. Depending upon school and state policies, this intervention can include the possibility of students' exclusion from educational settings. Although a principal may be reluctant to exclude students from school because of immunization compliance shortcomings, the school nurse understands the greater negative health consequences to immunocompromised students and staff that can exist when a non-immunized (without acceptable justification) student is allowed to enter and remain in an educational setting. The reluctance to exclude students may also be present during the current COVID-19 pandemic, especially if clear and succinct protocols grounded in medical science aren't developed. Thus, the current health challenge is another example where a school nurses' unique expertise and knowledge is important, and they must have a seat at the decision-making table, especially given the potential significance that a school and its classrooms, gymnasiums, libraries, and cafeterias present as ideal, super-spreader settings.

There are other factors that can contribute to the chasm between the principal and school nurse, resulting in negative impacts on class-

room achievement and success. These include the existing training and preparation practices of principals (Vanderbilt University, 2018; University of Wisconsin-Madison, 2018; Harvard University, 2018; Michigan State University, 2018; Teachers College, Columbia University; Duchesne County BOCES, 2018) as well as historical and contemporaneous topics commonly found (or not found) in the principal literature (Habegger, 2008; The Wallace Foundation, 2013; Lynch, 2018). For example, noticeably absent in many principals' education, training, and research literature are relationship models to guide effective and meaningful interactions with school nurses. Furthermore, simple acknowledgement of the school nurse's unique expertise, role and responsibilities in the educational milieu; and role in student classroom success is lacking. Without relationship models and recognition and acknowledgement, the interactional chasm that can form between the principal and school nurse may lead to decreased desired outcomes for students in the classroom. So how is the conflict addressed and the chasm successfully traversed?

The School Nurse as a Key Team Member for Improving Student Achievement and Classroom Outcomes: A New Model for Nurse Engagement

Although the principal-school nurse relationship is posited to be the most complex in the building (Davis, 2017), and has the highest potential for having a natural chasm form within the school milieu, these challenges can nonetheless be successfully bridged and resolved in order to optimize student academic outcomes. In particular, critical to bridging and resolving this natural chasm is the formation and sustaining of a mutually professional and respectful relationship between the principal and the school nurse. One important element in overcoming these challenges and improving student achievement and classroom outcomes occurs when school nurses are recognized not only for their unique, day-to-day roles and expertise but are engaged as part of the leadership team that makes both tactical and longer-term strategic educational practices, policies, and decisions.

However, based on the anecdotal evidence of the principal-school nurse relationship, in order to begin bridging this potential chasm, an effective and efficient school nurse does not sit idly and wait to initiate student health actions based on a supervisor's recommendations or for an explicit invitation to the educational leadership table. Thus, if the foundational elements for forming a professional and respectful bridge between the principal and school nurse are absent, and the former does not initiate steps toward thoughtful collaboration, the effective and efficient school nurse begins laying the basic structure. For instance, the school nurse would meet with the principal to succinctly identify their unique role and responsibilities and inquire about the latter's expectations for the

health office and preferred method of communication for receiving updates. In addition, the school nurse would share evidence on the role that physical and mental health plays in classrooms and academic success and, hence, the importance of the school nurse and health office (U.S. Department of Health and Human Services, n.d.; Whole Child, 2012; 2015; Every Student Succeeds Act, 2018; & Kelley, 1994). Furthermore, the school nurse recognizes their dependencies on other building professionals and staff. Therefore, they form and sustain important collaborations with other employees—e.g., teachers, teacher’s aides, support-service staff, and food-service and custodial workers—in order to have a successful health office (Davis, 2017; Davis & Lynch, 2018). These practices are supported by Kocoglu and Emiroglu (2017) who found that school nurses were important, positive contributors to students’ academic success and hence classroom performance. Especially during this unprecedented time of COVID-19, school nurses must contribute medically, scientifically sound recommendations and best practices appropriate for their individual and unique educational settings. Such recommendations and best practices need to address specific plans of action for classrooms, gymnasiums, libraries, hallways, visitor protocols, cafeterias, transportation, and custodial services.

In an ideal environment where a school nurse can have maximum impact, several fundamental elements must be present. These fundamental elements include:

- 1) the school nurse recognizes and embraces their diverse roles and responsibilities. These roles and responsibilities include being the school’s healthcare expert as a knowledge worker (Drucker, 1957);
- 2) an advocate for an environment that supports students’ day-to-day and long-term physical and mental health and safety. This advocacy and expertise not only includes first-order school health activities such as providing daily medications to manage chronic conditions like diabetes but can include parent/guardian education, such as communicating the importance of a spacer in the delivery of a fast-acting rescue inhaler medication for asthma or good, universal hygiene practices to prevent the occurrence or spread of COVID-19;
- 3) the school nurse must be the expert and openly share their knowledge regarding school related healthcare laws and guidelines as determined at the local, state, and where appropriate, federal level and disseminate that information as necessary to principals and parents/guardians. For example, an appropriately licensed medical professional, a registered nurse, only administers medications or must advocate a student with a disability cannot be excluded from field trips because it is convenient;
- 4) a principal that is a democratic leader (Lewin, Lippett, & White,

1939). As a democratic leader, principals recognize that they are not the most knowledgeable individuals in the building and the myriad activities that occur in the school milieu, in particular in the area of healthcare, and therefore welcomes and invites the school nurse's input;

- 5) a principal that is a divergent thinker. As a divergent thinker, this unique principal is confident to stray from educational conventional wisdom and judiciously tries leading-edge practices to enhance student success. For instance, they embrace the important role school nurses play in preparing all students for classroom success and welcome them to the educational leadership table.

Springboarding from Kocoglu's and Emiroglu's (2017) research, the importance of health and well-being for students' success in the classroom is best summed up by the 16th Surgeon General of the United States, Dr. Jocelyn Elders "I feel that we can't educate children who are not healthy, and we can't keep them healthy if they're not educated" (Kelley, 1994, p. 1). Furthermore, according to Kelley "...there has to be a marriage between health and education," (1994, p. 1). Therefore, the school nurse must not only be the primary care provider for students but also an integral and active member of a school's educational leadership team. Specific anecdotal examples where a school nurse plays an integral role in the delivery of daily care as well as a member of the school's leadership team where students' classroom success is optimized include:

- 1) Taking the lead in developing a collaboration with the school's food services team to ensure all students have a balanced, nutritious breakfast and lunch available. This collaboration may extend into defining a strategy that seeks and secures funding at the state and national level to reduce or eliminate meal costs to students.
- 2) Taking the lead in developing a collaboration with the school's custodial staff to create strategies that ensure the health office and school rooms are appropriately clean, healthy, and safe. For example, ensuring common touch surfaces (e.g., desk surfaces and doorknobs) are properly cleaned and free from sharp edges.
- 3) Educating parents/guardians about "best practices" for an ill student and illness prevention practices. For example, when a student has gastrointestinal distress, they are expected to be fever/vomiting/diarrhea free for 24 hours prior to returning to the classroom. Furthermore, the school nurse would provide education to parents/guardians regarding hydration and how to return to the student's common diet.
- 4) Collaborating with support services staff, such as licensed clinical social workers, to meet the acute mental health needs of students in an emotional crisis while in parallel, engaging parents/guardians

regarding the creation of a longer-term strategy for meeting their child's needs, such as facilitating out-of-school counseling.

- 5) Taking the lead in developing a collaboration with teachers to develop a caring, compassionate, and meaningful strategy to manage the health office "frequent flier."
- 6) Providing acute and chronic care within the nurse's scope of practice to health office visitors. For example, assessing a student's painful sore throat or administering daily medication as prescribed by a healthcare provider for a diagnosis of ADHD, respectively.
- 7) Taking the lead in reviewing immunization records and identifying students out of compliance and requiring intervention, ultimately including the possibility of their exclusion from the educational setting depending on school and state policies. Although a principal may be reluctant to exclude students from school because of immunization compliance shortcomings, the school nurse understands the greater negative health consequences that exists by permitting a non-immunized student to enter and remain in the educational setting. In particular, the school nurse appreciates the potential for serious harm that non-compliant students can present to themselves and immunocompromised and at-risk students and staff. This example is immediately imperative and concerning as the American Academy of Pediatrics (2018), Pulcini, et al. (2017) and Price, et al. (2013) identify that many chronic diseases are increasing in the school milieu.
- 8) Collaborating with school leadership to develop and implement COVID-19 protocols, procedures and best practices.

Principal-School Nurse Relationship Model

The creation of a successful principal-school nurse relationship that includes providing a place at the educational leadership table for the school's healthcare professional will facilitate and contribute to student classroom success. However, in order for this important relationship to form and be sustained a functioning and application-oriented working model was developed. In the model's development, based on the authors' myriad expertise and experiences, six key elements are considered. These six key elements are:

- 1) A proactive school nurse that advocates for and delivers acute and long-term healthcare services to students.
- 2) Recognition of the seminal work of Drucker (1957) regarding knowledge work and the knowledge worker and recognition that school nurses are in this category.

- 3) Understanding the seminal work on basic leadership styles (i.e., laissez-faire, democratic, and coercive/authoritarian) by Lewin, Lippitt, & White (1939) summarized in Table 1.
- 4) Acknowledgement and respect by the principal of the unique skills, expertise, roles, responsibilities, and state mandated guidelines that the school nurse operates under to optimize student achievement and outcomes.
- 5) Acknowledgement by the school nurse of the skills, expertise, role, responsibilities and state mandated guidelines unique to the principal to optimize student achievement and outcomes including their positional authority within the building.
- 6) The importance and value of bilateral, open communication, both verbal and written, on a timely basis, between the principal and school nurse.

Table 1

Leadership Styles and Their Characteristics Simply Defined (Lewin et al., 1939 & Nelson, D., & Quick, J., 2015)

Leadership Style	Characteristics
Laissez-Faire	Leader is hands off and lets others make decisions
Democratic	Leader involves his/her team in decision making.
Coercive	Autocratic

Let's explore some of these six elements in more detail. School nurses must be professionally proactive, being a constant advocate for students' physical and mental health, tactically and strategically. These healthcare delivery activities must span the spectrum from day-to-day, singular maintenance actions for individual students to advocating for a presence at the educational leadership table where longer range, strategic student educational decisions are made. This foundational element is grounded in Drucker's Landmarks of Tomorrow (Drucker, 1957) where he forwarded the concept of knowledge work and the knowledge worker, two constructs that were developed in the nascent evolution of traditional corporate management to yield high-performance outcomes. Although founded in the corporate setting, Drucker's constructs are nonetheless directly applicable to the principal-school nurse relationship in the educational environment. For example, knowledge work activities are beyond simple tasks that require basic rote memory and repetitious actions. Knowledge work requires critical thinking and application of learned skills, theories, concepts, and purposeful experiences by a unique individual, in this case, the school nurse. Based on the traditional path that many individu-

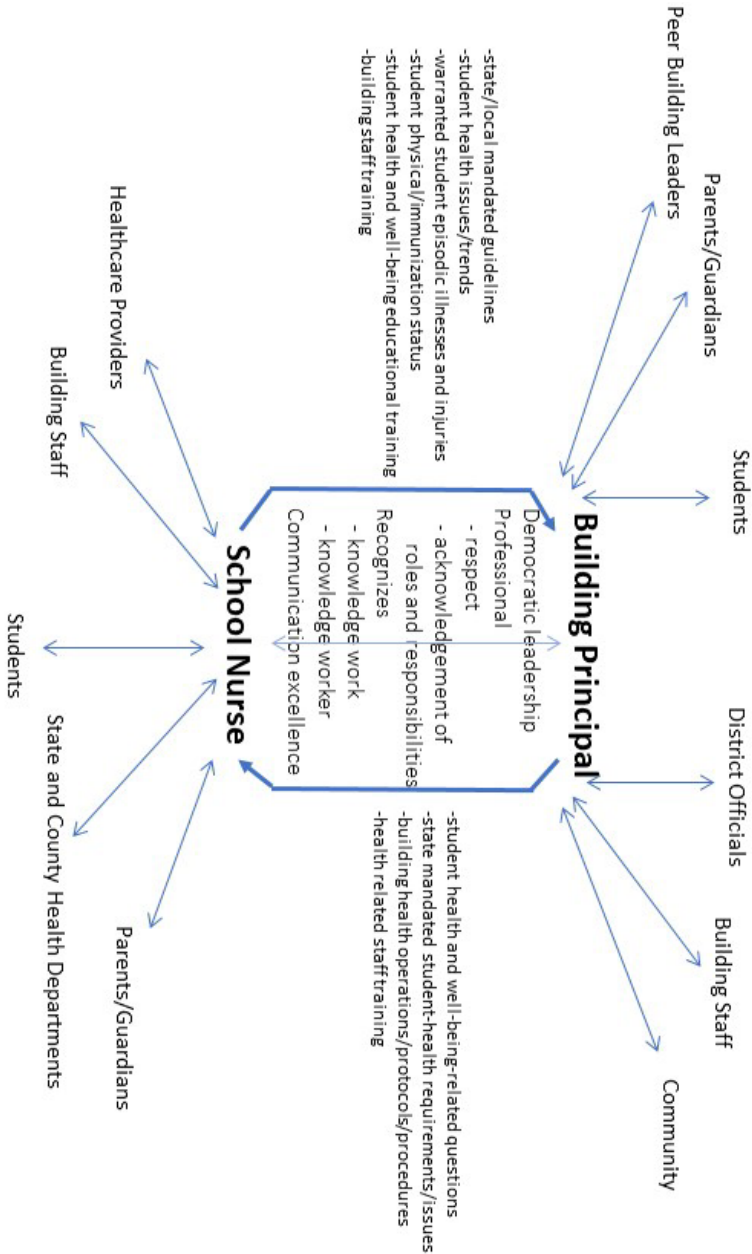
als commonly follow to school principal positions, it is not unexpected to think healthcare knowledge is outside their expertise, background, education and training. Furthermore, merging Lewin's, Lippitt's and White's (1939) seminal investigations and definition of basic leadership styles into the contemporaneous knowledge-worker environment found in a school setting, the democratic leader is the preferred model for the principal to adopt (Davis, 2017). The democratic leader recognizes their experience and knowledge limitations and invites other experts to the table to share their expertise. Finally, a trusting, respectful relationship that mutually acknowledges the needs, expertise, and unique talents that the principal and school nurse possess is paramount.

The importance of this trusting, respectful relationship in a knowledge-work environment is best captured by Wartzman (2014), who identifies that the executive, in this case the principal, is not the most knowledgeable and expert individual in the myriad activities that occur in the school milieu. That is, the principal must rely on their team of experts or knowledge workers to facilitate and foster student success. And for student health related matters and concerns, the school nurse is the expert. Thus, to optimize student outcomes, a professional relationship between the principal and school nurse that is based on trust, mutual respect, and an understanding about each other's roles, responsibilities, and needs must exist. Figure 4 shows the high-performance principal-school nurse relationship model constructed using the aforementioned elements.

In Figure 4, the authors capture the school nurses' roles and responsibilities, extend Drucker's (1957) seminal work by breaking the traditional subordinate-superior relationship paradigm between the principal and school nurse, respectively, while simultaneously incorporating Lewin's, Lippitt's, and White's (1939) construct to justify healthcare providers' place at the educational leadership table in order to optimally prepare them for classroom activities. Although the model shows specific responsibilities and expectations to build a high-performance relationship between the principal and school nurse that will aid in optimizing students' readiness for the classroom, the authors acknowledge that, in actuality, a continuum of competency levels exist from school to school. Therefore, the model must be adjusted for each individual setting and be flexible enough to account for a principal and school nurse's specific knowledge, skills and expertise. Furthermore, the model's flexibility reflects its ability to adjust to the specific needs and expectations required to address the challenges presented to schools as a result of the COVID-19 pandemic.

Figure 4

High-performance professional interaction model for Building Principal and School Nurse to optimize student health, wellbeing, safety and achievement (Davis, 2017).



Conclusion

Although there is a significant disparity in roles, responsibilities, education, training, and expertise between the principal and school nurse, these differences must not serve as obstacles to ensuring the short- and long-term health, safety, and well-being of students. These health and safety tenets are key to preparing students for success in the classroom. We argue that the principal's leadership lays the foundation for creating a respectful, synergistic relationship with the school nurse. However, responsibility for relationship building does not lie solely with the principal. As a professional, the school nurse must also take responsibility for relationship building and be proactive in initiating activities that ensure the greatest opportunity for this vitally important professional collaboration to occur. In addition, a model to support this vital and critical relationship is developed and illustrated, a model that is sufficiently flexible to meet the needs of myriad school settings and situations. School nurses must also have the opportunity to possess a relationship with other school leaders by having a place at the educational leadership table. Forming and maintaining this desirable and beneficial relationship and having a presence at the leadership table leads to more holistic solutions and positive academic outcomes. For example, a mutualistic principal and school nurse relationship, along with the latter having a seat at the educational leadership table, ensures students' health is a foremost concern in decision making, enhancing their readiness to be successful in the classroom. The importance of this relationship and having a seat at the educational leadership table is magnified during the current COVID-19 pandemic.

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Charles R. Davis is the school nurse at at Webutuck Central School District's Eugene Brooks Intermediate and High Schools in Amenia, New York.

Eric J. Lynch is the principal of Webutuck Central School District's Eugene Brooks Intermediate and High Schools in Amenia, New York.

Patti A. Davis is a transition specialist at Dutchess County's Boards of Cooperative Educational Services (BOCES) in Poughkeepsie, New York.

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