MULTI-STAGE RESEARCH FOCUSED ON INSTRUCTIONAL REDESIGN AND ORGANIZATIONAL RECULTURING

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ABSTRACT

Improvement science enables school leaders and practitioners to tackle local problems of practice via the design and implementation of interventions aimed at the advancement of overall performance. This improvement science project targeted change in classroom practices, specifically the need to reorient staff toward instructional norms that promote participatory learning. The following objectives guided the research: (a) to design an intervention that might observe and evaluate teacher efforts to implement new instructional norms in the classroom; (b) to evaluate the extent to which the intervention can be successfully implemented and to identify the conditions that might facilitate or impede successful implementation; (c) to evaluate whether the intervention might generate desired outcomes and to assess the intervention's adaptability and utility for other contexts. The resulting theory of improvement called for the researchers to engage participants in professional learning and subsequent coaching sessions designed to support teachers as they redesigned instruction to facilitate collaborative inquiry and learning.

Lesson plans, classroom observations, coaching transcripts, and teacher interviews were used to document the implementation process and its effects. A thorough analysis of the data revealed the conditions that facilitated student collaboration and discourse: integration of collaborative learning structures; consistent use of conversation stems; effective time management; and quality questioning that inspires higher-order thinking. Likewise, initial findings suggest an improved culture of teaching and learning that boasts increased student engagement and achievement. Implications for future improvement work include the need to test the scalability of the intervention in more classrooms and different schools.

DEDICATION

This dissertation is dedicated to my parents, Glenn and Debby Hahn. They consistently embolden me to chase my dreams, no matter how big or overwhelming the resulting journey. This would not have been possible without their genuine support and endless encouragement.

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CHAPTER 1: INTRODUCTION

The field of education is plagued by top-down reforms promising a myriad of improvements, primarily enhanced achievement for all students. Such movements/mandates often bring curriculum changes, redesigned resources, modernized pedagogical strategies, increased administrative requirements, and new testing standards. In an effort to keep up with the latest reform, school leaders "tend to adopt, attack, and abandon" prescribed initiatives (Rohanna, 2017, p. 66). Leaders quickly embrace recommended interventions, requiring educators to rapidly execute them as well. In their haste, teachers often fail to tailor interventions to their specific contexts. Without prompt proof of the pledged outcomes, potentially effective interventions are prematurely discarded. In other words, ever-changing policy forces schools to "implement change broadly rather than engage in the sustained efforts needed to implement change deeply" (Dolle et al., 2013, p. 445).

Improvement science offers an alternative to the piecemeal efforts that have failed to produce systemic, widespread results thus far. Devised to accelerate learning-by-doing, improvement science is a user-centered approach that drives continuous improvement by tackling local problems of practice (Carnegie Foundation, 2022; Bryk et al., 2017). It helps researchers and practitioners dive deep into the system, striving to learn how the system works, identify where breakdowns exist, and generate ideas about what steps can be employed to enhance overall performance (Institute of Education Sciences, 2017; Hinnant-Crawford, 2020). In addition, improvement science allows stakeholders to engage in the design and implementation of change ideas (Hinnant-Crawford, 2020; Lewis, 2015). A critical aspect of improvement science is the

Plan-Do-Study-Act (PDSA) cycle which utilizes rapid, small-scale testing to gauge the effectiveness of proposed interventions (Carnegie Foundation, 2022; Bryk et al., 2017; Institute of Education Sciences, 2017). By repeatedly implementing PDSA cycles, practitioners may learn to adopt, modify, or abandon interventions in accordance with predefined goals (Hinnant-Crawford, 2020; Lewis, 2015). Improvement science also focuses efforts on understanding how interventions "can be adaptively integrated with efficacy into varied contexts," thereby facilitating systemwide integration (Bryk et al., 2017, p. 25). Ultimately, improvement science provides schools with a means to effectively address challenges in a way that fosters a culture of continuous learning and improvement.

Rationale and Background

While educational change processes lie at the heart of this study, the research team was most interested in learning how educational leaders might go about improving the instructional environment. Specifically, we wanted to discover how school leaders might successfully reorient staff toward new instructional norms that promote student engagement in learning. As such, we used improvement science to initiate change via professional learning and coaching designed to encourage and support teachers as they implemented instructional interventions that facilitate student practices for collaborative inquiry and learning.

This dissertation is framed by a school improvement effort led by the researcher and two other colleagues who are educational leaders. Our collective effort began with a review of literature. The literature review was then used to inform the development of a theory of improvement as well as corresponding change ideas. The overall theory of improvement is represented in a conceptual model, otherwise known as a driver diagram.

The crux of our proposed research is built around our collective efforts to test the change ideas that are depicted in our driver diagram. These change ideas were tested systemically through a series of PDSA cycles. Results from each PDSA cycle will inform the development of future improvement and action theories for reculturing classrooms in support of student collaborative inquiry and learning.

Statement of the Problem

The proposed study was devised to address a problem of practice at Florence Middle School (FMS). Initially, the researchers sought to address the problem of excessive discipline as documented by data from January to March of 2020 that revealed an 87% increase in office referrals from the same period in 2019. However, an analysis of 2020 discipline data revealed the majority of referrals cited off-task behaviors in the classroom, primarily unauthorized use of a communication device (i.e., cell phone usage). After pairing this newfound data with information garnered from 16 empathy interviews with stakeholders, the researchers began to view the problem differently.

State standards informed the content to be delivered in each course, but classroom norms and procedures varied throughout the building. In fact, the instructional environment was characterized by inconsistent practices, many of which failed to promote participatory learning. Indeed, instead of engaging students in learning activities, instruction was dominated by teacher monologues. The limited teacher-student exchanges were situated around closed questions meant to "seek brief, accurate confirmation that selected students knew the 'right answers'" (Mercer & Howe, 2012, p. 13). This transmission approach to instruction favored student compliance to teacher prompts over engagement. It also appeared to open the door to boredom, problem behaviors, and disciplinary challenges.

In light of these dynamics, the research team shifted focus from trying to reduce negative student behaviors to trying to create classroom conditions that might foster participatory learning. In other words, we recast the problem of practice as an engagement issue. With a new focal point, the research team theorized about the mechanisms needed to redesign instruction such that students were actively engaged in classroom activities. The resulting study aims to guide the improvement of instructional practices via the implementation of research-based interventions that encourage students to direct their own learning via collaboration and discourse.

Purpose Statement

The purpose of this improvement science research is to reorient staff toward new instructional norms that promote participatory learning. Specifically, the researchers aim to engage participants in professional learning and subsequent coaching sessions designed to encourage and support educators as they redesign instruction to promote student dialogical practices for collaborative inquiry and learning. The proposed instructional redesign requires consistent use of the gradual release of responsibility (GRR), collaborative learning structures, and conversation stems to intentionally integrate social interaction and purposeful dialogue into instructional practices.

The following objectives guide the research:

1. To design an intervention that might observe and evaluate teacher efforts to implement new instructional norms in the classroom.
2. To evaluate the extent to which the intervention can be successfully implemented and to identify the conditions that might facilitate or impede successful implementation.
3. To evaluate whether the intervention might generate desired outcomes and to assess the intervention's adaptability and utility for other contexts.

Significance of the Study

The study is significant because it provides practical, empirical, theoretical, and policy contributions to the field. In brief, this study is practically significant as the final product is the documentation of an improvement science project in which educational leaders attempted to reorient staff toward new instructional norms that facilitate collaborative inquiry and learning among students. Since the prescribed change ideas proved effective, there are exciting implications for teaching and learning. First and foremost, the improvement science project resulted in enhanced instruction and advanced student learning at FMS as students were exposed to educational experiences that featured collaboration and guided discourse. Furthermore, the study provides other schools with a framework for instructional redesign focused on increased collaboration and student learning.

The study is empirically significant as it presents real-world evidence concerning efforts to reculture classrooms in support of collaborative inquiry and learning. As the "primary instrument for data collection and analysis," the researcher was present and involved with participants throughout the duration of the study (Merriam & Tisdell, 2016, p. 16). Consequently, the researcher offers first-hand accounts of the improvement science process through examination of multiple data sources. Similarly, the participants' personal experiences and outcomes are shared via quotes from coaching sessions and interviews. The researcher highlights each participant's voice by selecting and organizing quotes into a narrative that captures the individual's spirit.

Regarding theoretical significance, this study traces the development and implementation of a theory of improvement needed to solve a local problem of practice. Visually represented by a driver diagram, the theory of improvement identifies a measurable aim statement, primary

drivers, secondary drivers with associated interventions, and change ideas. The theory of improvement also guides the systematic and methodical implementation and study of change ideas. Since the proposed change ideas successfully reoriented a majority of participating staff toward new instructional norms that facilitate collaborative inquiry and learning, the theory of improvement serves as a recipe for similar schools seeking comparable change.

The study yields implications for policy as well. Currently, the field of education suffers from chronic reform that compels fast implementation, often resulting in failure and frustration. This study presents improvement science as an avenue to quality, sustained improvement in which stakeholders are actively engaged in problem solving. Improvement science recognizes the capacity of educators to participate in disciplined inquiry as they collaborate to design, test, and implement change ideas that improve the entire system. As such, policy leaders should embrace improvement science and its theory of "learning fast to implement well to achieve quality reliably at scale" (Bryk et al., 2017, p. 191).

Overview of the Study

This study employed improvement science in an effort to facilitate instructional change at FMS. Improvement science is used to "address a specific *problem* in a practice-based setting … [by] documenting what happens when trying a new strategy or intervention" (Merriam & Tisdell, 2016, p. 4). As such, the researchers and participants engaged in a cycle of actions to improve instructional practices (Herr & Anderson, 2015). Specifically, the research team aimed to initiate change by utilizing professional learning and coaching to support teachers as they implemented instructional interventions that facilitate student practices for collaborative inquiry and learning.

"Based on the assumption that the researcher wants to discover, understand, and gain insight" into an issue of central importance, purposive sampling was utilized for this study

(Merriam & Tisdell, 2016, p. 96). In other words, the research team chose the site and the people to be studied. The site was predetermined as this improvement science study was aimed at solving a current problem of practice at FMS. However, the researchers were purposeful in selecting the participants for the first PDSA cycle. Not only did the English, math, and science teachers collaborate to plan common lessons, but most exhibited a growth mindset and a willingness to try new things. Furthermore, by focusing on the educators who teach core content, the majority of FMS students were exposed to the practices for collaborative inquiry and learning.

Each participant attended the initial professional learning session in early August 2021. With the aid of a Google Slides presentation and several handouts, the research team shared the background, purpose, and expected outcomes of the proposed instructional interventions. The researchers began with a review of the GRR framework, stressing the need to integrate opportunities for collaborative inquiry and learning into the *We do it* and *You do it together* portions of each lesson. We then presented the learning plan template, a comprehensive tool meant to assist participants in their efforts to integrate opportunities for collaborative inquiry and learning.

Next, the research team introduced the norms for inquiry and learning, detailing the student practices we hoped to observe in the future. The researchers then shared the Student Stems for Building Conversations. We explained that the conversation starters would serve to structure student dialogue during the *We do it* and *You do it together* phases of learning. Furthermore, the researchers reviewed various Kagan cooperative learning structures (e.g., A/B Partners, Single Round Robin, Continuous Round Robin, Timed Round Robin, and Think-Write-Round Robin), emphasizing the need to implement such structures during the highlighted GRR

phases. Finally, the two observation tools were revealed as the researchers explained they would be looking for evidence of both the structures and student practices for collaborative inquiry and learning.

With a mid-September start date in mind, the participants were reminded to utilize the provided template for planning purposes and submit their weekly plans to the shared drive within the FMS Google Drive. It was also expected that they post the anchor chart, situate the collaborative placemats within student groups, and distribute the flip charts prior to the first observation.

The research team originally planned to conduct classroom observations and follow-up coaching sessions each week. However, multiple unforeseen variables led the researchers to change the proposed timeline. The goal soon became to observe each participant's classroom on a bi-weekly basis. During these 30-minute observations, the researchers documented and described evidence of the implementation of collaborative inquiry and learning structures. The subsequent coaching session, which lasted approximately ten minutes during the participant's planning period, was scheduled for the following week. The primary goal of these sessions was to offer support as the participant implemented the strategic interventions designed to facilitate student practices for collaborative inquiry and learning. However, the researcher-coach also encouraged the participant to establish a realistic, attainable action step for the next observation. Upon the conclusion of the PDSA cycle, the participants completed a brief follow-up interview.

Multiple data sources were collected and analyzed throughout the duration of the study. Lesson plans, classroom observations, coaching transcripts, and teacher interviews were used to document the implementation process and its effects. The researcher accessed lesson plans in order to assess each teacher's application of the GRR framework to lesson planning. Likewise,

the researcher conducted and chronicled classroom observations, coaching sessions, and teacher interviews at FMS. Researcher-created observation tools were used to document and describe evidence of collaborative inquiry and learning during observed lessons. Both coaching sessions and final interviews were audio recorded in order to preserve the participants' answers for transcription and analysis. The resulting qualitative interview data was used to (a) analyze the extent to which the interventions were or were not effective and (b) determine modifications needed for the second PDSA cycle.

Summary

This chapter introduced improvement science, presented the rationale and background of the study, and supplied the statement of the problem. The purpose statement was offered before the research objectives were revealed and the significance of the study was addressed. Lastly, an overview of the study was provided.

CHAPTER 2: REVIEW OF LITERATURE

The purpose of this study is to reorient staff toward new instructional norms that promote participatory learning among students. Specifically, myself and the research team aimed to engage teachers in professional learning and subsequent coaching sessions designed to support them as they redesigned instruction to promote student dialogical practices for collaborative inquiry and learning. This chapter begins with the definition of a key term inherent to the study's purpose. The theoretical rationale is provided prior to an examination of the intervention framework. Finally, existing research is reviewed to substantiate the theory of improvement and corresponding change ideas.

Definition of Term

This dissertation is anchored in the tenets of participatory learning. To promote clarity and precision from the onset, I defined this term as follows. As adapted from Johnson (2006), participatory learning is the deep and lasting learning that occurs when students interact among themselves while engaging with the content or materials. The instructor facilitates participatory learning by ensuring students are "actively involved in achieving the objectives of the lesson(s) … [by] connecting with, testing, exploring, and mentally manipulating ideas. This is often accomplished through discussion, debate, and dialogue" (Johnson, 2006, p. 29).

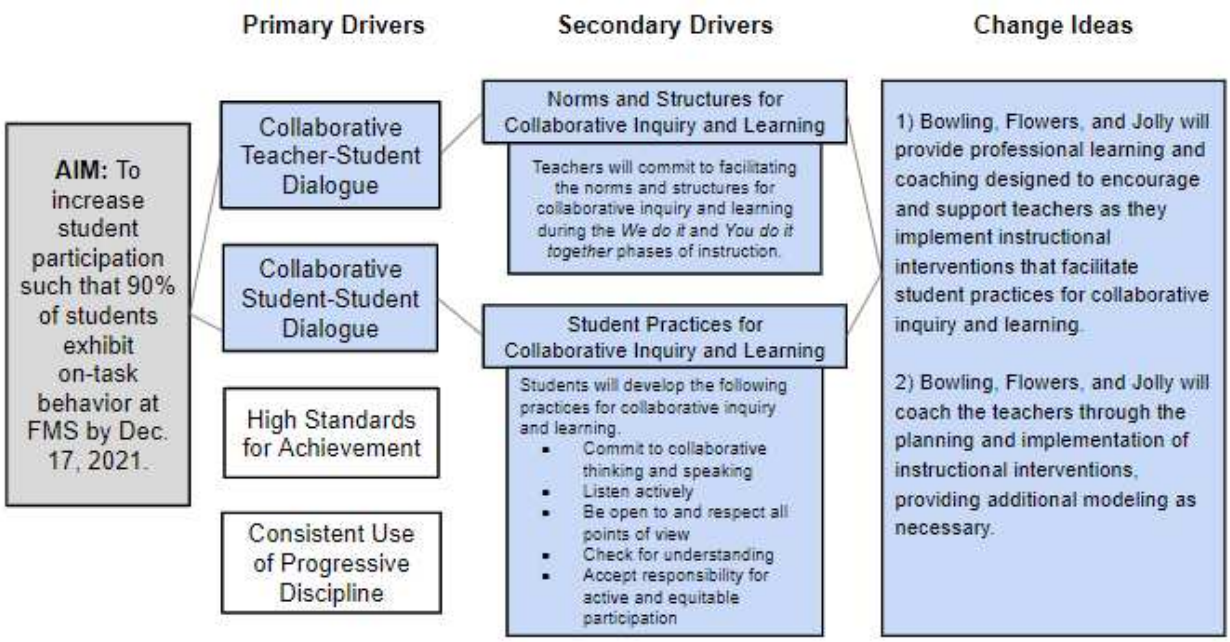
Theoretical Rationale

This study's theory of improvement draws from the research literature as well as the professional knowledge and knowledge of context owned by the research team. The theory of improvement is visually represented by the driver diagram presented in Figure 1. It serves as a

roadmap for the improvement initiative as we aim to redesign instructional practices to promote participatory learning by implementing norms and structures that foster student engagement and learning. Specifically, we hypothesized if instructional practices were redesigned to facilitate collaborative inquiry and learning such that teachers and students engaged in collaborative academic dialogue, then participatory learning would increase and students would exhibit increased on-task behaviors as a consequence.

Figure 1

Driver Diagram



As notated in Figure 1, anticipated change begins with the design and delivery of professional development that engages teachers in the study and use of focused instructional interventions that foster student practices for collaborative inquiry and learning. Using a Google Slides presentation and several instructional aids, the research team began the professional development session with a review of the gradual release of responsibility framework. We targeted the *We do it* and *You do it together* phases, highlighting the need to integrate

opportunities for collaborative inquiry and learning into these two phases. The research team then introduced the norms for inquiry and learning, explaining the practices we hoped students would use in the future. In addition, the researchers presented the Student Stems for Building Conversations, modeling how conversation stems can be used to structure student dialogue. Finally, the researchers demonstrated various Kagan cooperative learning structures, again emphasizing the need to implement such structures during the *We do it* and *You do it together* phases of instruction.

The key to change, however, is found in the subsequent coaching sessions through which the researchers supported teachers as they planned for and implemented the instructional interventions that facilitate student practices for collaborative inquiry and learning. Throughout the study, the researcher integrated features from three prominent coaching models: peer coaching, instructional coaching, and cognitive coaching. Modeling and reflective conversations, which are central ingredients of both peer coaching and instructional coaching, were utilized by the researcher (Devine et al., 2013; Colucci, 2014; Joyce & Showers, 2002; Segner, 2020; Sword, 2021). However, the researcher primarily employed the more formal method of cognitive coaching as it provided a clear format (i.e., preplanning, observation, and reflection) to effectively champion each practitioner's existing strengths while also fostering unexplored capacities. Furthermore, this coaching model supports one's abilities to make both changes in their thinking and improvements in their teaching (Bair, 2017; Knight, 2007; Costa & Garmston, 2002).

Intervention Framework

Just as literature was used to inform the study's theory of improvement, literature was instrumental in the development of the study's interventions. Research indicates that the

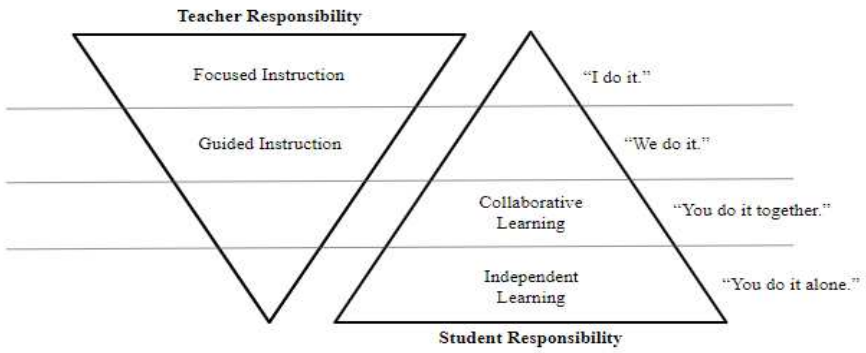
implementation of new instructional norms, which integrate social interaction and dialogue, will encourage students to develop practices for collaborative inquiry and learning that can help them become more active participants in their own learning (Graves & Fitzgerald, 2003). As such, the proposed improvement rests on instructional redesign in which teachers (a) plan lessons according to the gradual release of responsibility and (b) intentionally facilitate opportunities for collaborative inquiry and learning, specifically during the *We do it* and *You do it together* phases of instruction.

Gradual Release of Responsibility

Originally developed by Pearson and Gallagher to aid in reading instruction, the gradual release of responsibility (GRR) framework is rooted in several theories. One of these theories is sociocultural theory. This theory follows the view that learning occurs through intentional interactions with others (Fisher & Frey, 2014; Pearson et al., 2019). Accordingly, the goal of the GRR instructional framework is to encourage engagement and equip students to become self-directed learners. To do so, teachers must deliver lessons that are intentionally planned to incorporate four instructional phases: focused instruction, guided instruction, collaborative learning, and independent learning (Fisher & Frey, 2014). The phases of instruction are illustrated in Figure 2.

Figure 2

Gradual Release of Responsibility Instructional Framework



The four essential and interrelated phases are designed to shift the academic load from the instructor, to joint responsibility of instructor and learner, to independent practice and application by the learner (Pearson & Gallagher, 1983). Graves and Fitzgerald (2003) explain the shift in academic load as follows:

> Effective instruction often follows a progression in which teachers gradually do less of the work and students gradually assume increased responsibility for their learning. It is through this process of gradually assuming more and more responsibility for their learning that students become competent, independent learners. (p. 98)

Focused instruction, also known as the *I do it* phase, is usually done in a whole group setting and typically lasts 15 minutes or less. This phase prepares students for learning by "establishing purpose, modeling or demonstrating, thinking aloud, and noticing" (Fisher & Frey, 2014, p. 21). After presenting the lesson's objective and its relevance, the instructor models or demonstrates the curricular content, making sure to explain the thinking and reasoning required to master the knowledge or skill. Noticing, the final feature of focused instruction, occurs as instructors "notice what students do with the new learning and make rapid decisions" regarding subsequent instruction (Fisher & Frey, 2014, p. 33).

The guided instruction phase of the GRR framework is also referred to as the *We do it* phase. This phase lasts between 10 and 20 minutes, and it is frequently conducted with small groups of students who share common academic needs (Fisher & Frey, 2014). During this phase, the cognitive load begins to shift from the instructor to the students. The instructor strategically utilizes questions, prompts, and cues to guide learners to increasingly complex thinking as they apply the presented knowledge or skill to a new situation. Fisher and Frey (2014) explain that "guided instruction is, in part, about establishing high expectations and providing the support so that students can reach those expectations" (p. 7).

The collaborative learning phase, also called the *You do it together* phase, normally lasts between 25 and 40 minutes. During this phase of instruction, "students assume increased responsibility for their learning and the learning of their peers," (Fisher & Frey, 2014, p. 66). Learners engage in discussion, problem solving, and exploration to make connections between the curricular content and their own lives. As they work together to consolidate ideas to gain a richer understanding of the content, the instructor facilitates learning by focusing on specific group needs (Fisher & Frey, 2014). This shift in roles promotes learner-centered classrooms in which high standards of achievement coupled with effective pedagogical practices may make it possible for learners to develop deep understanding of important content.

The independent learning phase is also referred to as the *You do it alone* phase. While this phase may last minutes or days, the focus is always on application. Students must work alone to demonstrate their understanding of the content by applying their knowledge and skills to a new learning task. During independent learning, the instructor's role is to notice performance and provide feedback that is timely, specific, understandable, and actionable (Wiggins, 1998).

It is important to note that the GRR framework is not linear. Rather, it is a fluid, recursive approach to instruction (Elliot et al., 2019). As such, instructors are at liberty to reorder the phases and/or revisit multiple phases during a lesson (Grant et al., 2012). They cannot, however, omit phases. For deep learning to occur, students must experience all four phases of instruction when encountering new material (Fisher & Frey, 2014).

Collaborative Inquiry and Learning

As noted earlier, our intervention was designed to create new norms of collaborative learning and instruction in the classroom. Collaborative inquiry and learning is generally defined as the joint intellectual efforts by students who work in pairs or small groups to gain knowledge as they share ideas and experiences, give and receive feedback, and solve problems to develop critical-thinking skills (PLS 3rd Learning, 2014). In other words, collaborative inquiry and learning is the process through which student groups engage in common academic endeavors, constructing their own understanding of content and skills. Collaborative inquiry and learning fosters a culture of teaching and learning in which students are immersed in self-regulated learning activities facilitated by the teacher (Bell et al., 2010).

In this learner-centered environment, students grapple with challenging ideas and confront obstacles (Makar & Fielding-Wells, 2017). As they work together to make predictions, debate ideas, draw conclusions, and communicate findings, learning is advanced. Likewise, students cultivate a variety of vital soft skills such as communication, negotiation, and leadership (Fisher & Frey, 2014). To create a classroom built on collaborative inquiry and learning, an educator must establish instructional norms to support such learning (Evertson & Poole, 2003).

Instructional Norms

Instructional norms are the academic expectations that guide “planning and in-class teaching behaviors" (Hora & Anderson, 2012, p. 577). As such, they are the explicit and implicit understandings that govern the design and implementation of instructional practices, including the actions and interactions of both students and teachers. To generate a supportive learning environment, instructional norms must feature high standards for achievement and include behavioral norms focused on acting responsibly and treating others with respect and concern (Good & Brophy, 2000). Research reveals the need for teachers and students to practice norms repeatedly in order to “understand the appropriateness of the norm deeply and follow it spontaneously” (Chang & Song, 2016, p. 755). When such norms are maintained, educators can devote more time to impactful teaching and learning (Brophy, 2000).

Literature Review

The research team developed this multi-faceted, multi-stage theory of improvement based on a thorough review of the research literature. The literature review was conducted to promote the probability that the intervention framework and resulting approach are empirically-supported, theoretically sound, and catered to the unique context of our local school community. Three research-supported constructs informed the improvement initiative: (a) Sociocultural Theory, (b) Professional Development, and (c) Coaching. The remainder of this chapter details the research concerning each, beginning with a brief discussion of how sociocultural theory helped shape the theory of change.

Sociocultural Theory

This study’s overall theory of improvement is grounded in sociocultural theory and analysis. Sociocultural theory is rooted in the work of Vygotsky, a Russian psychologist who

believed that involvement in social interactions and culturally organized activities plays an important role in psychological development. Namely, learning is a social process that occurs "as a learner interacts with other people, objects, and events in the collaborative environment" (Wang et al., 2011, p. 297). Since the researchers strive to engage both adult and student learners in socially shared activities that integrate dialogue within the learning process, the following tenets of the sociocultural perspective are applicable throughout this study:

1. Social interaction influences learning.
2. Language mediates the learning process.

Vygotsky proposed that cognitive development, especially higher mental functioning, has its roots in social relations (Scott & Palincsar, 2013; Bonk & Kim, 1998). In fact, Vygotsky (1978) explained that cognitive abilities emerge twice – "first, on the social level, and later, on the individual level; first, between people (interpsychological) and then inside the learner (intrapsychological)" (p. 57). Thus, the sociocultural perspective assumes that cognition is formed through participation in social activities.

There is a significant body of evidence to support this perspective. According to Mercer and Howe (2012), involvement in joint activities often leads to the generation of new insights and ways of thinking. Allman (2018) posits that by working together in a broad range of tasks, learners internalize shared experiences and acquire advanced knowledge and strategies. Similarly, Dean et al. (2012) contend that students learn more and retain information longer when they work collaboratively. It follows that "socioculturally based pedagogical strategies emphasize dialogue, peer collaboration, questioning, and joint knowledge construction" (Bonk & Kim, 1998, p. 42).

Vygotsky also argued that social activity is "mediated by culturally constructed tools such as language, materials, signs, and symbols that create uniquely human forms of higher-level thinking" (Wang et al., 2011, p. 298). Consequently, the sociocultural paradigm views language as an essential tool in the learning process. Dialogue "gives the student an opportunity to formulate ideas through speech with feedback from others to help in clarifying, questioning, and bringing together previous understandings and new learning" (Heineke, 2013, p. 412). When classroom practices encourage interaction, negotiation, and collaboration via established norms for discourse, the learner can take the new knowledge or skills acquired in the social setting and apply the information for independent use (Scott & Palincsar, 2013; Bonk & Kim, 1998). Furthermore, as students share knowledge, challenge ideas, and evaluate options in a constructive and equitable way, student participation and educational outcomes improve (Mercer & Littleton, 2007; Littleton & Howe, 2010).

Research provides important evidence in support of these theoretical propositions. For example, Barnes and Todd (1995) found that when students engage in open discussion and argument with their peers, they assume greater ownership of their learning. Likewise, Mercer and Howe (2012) discovered that reflective discussions help better prepare students for independent learning.

In sum, sociocultural theory is based on the grand premise that knowledge is socially constructed and mediated by dialogue. Intervention research in schools support this foundational claim. Indeed, studies have yielded positive effects when students are encouraged to collaborate and communicate in the classroom, particularly when the views of all participants are sought and discussed. Garrison and Akyol (2013) explain that a strong social presence, as characterized by sustained collaboration and dialogue, results in enhanced learning and improved retention. When

an individual's "prior experiences and knowledge are recognized and integrated into learning experiences," students feel valued, "their motivation and satisfaction increases, and learning becomes deeper, lasting, and more meaningful" (Allman, 2018, p. 7). To conclude, this improvement science project, which is informed by both theory and research, draws on a sociocultural approach to instruction which emphasizes learning via collaboration and discourse.

Professional Development

The improvement initiative was informed by the literature on professional development. In fact, research highlights the need for educational leaders to provide ongoing staff development in order to foster teacher growth and facilitate organizational change (Sun & Leithwood, 2016; Koonce et al., 2019). Likewise, Brion (2020) posits that focused professional learning is required "to ensure sustained and sustainable change" (p. 38). Despite the demand for professional development, research on the topic is especially broad as the needs for capacity building in schools are often vast and variable. That noted, the literature on professional development tends to focus on the following elements: (a) Definitions, (b) Purposes, (c) Components, and (d) Results.

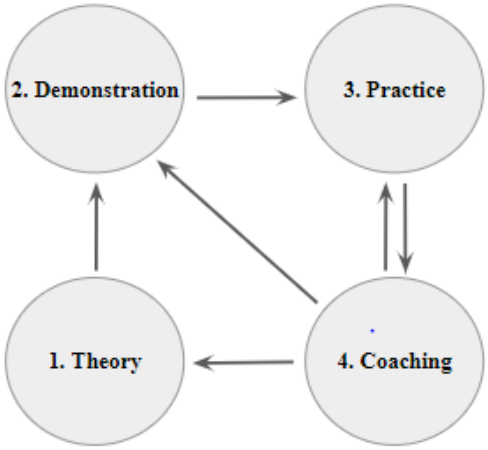
Definitions. Professional development is "a lifelong collaborative learning process that nourishes the growth of educators both as individuals and as team members to improve their skills and abilities" (Speck & Knipe, 2005, p. 4). Speck and Knipe (2005) argue that professional learning opportunities should inject new knowledge and life into classrooms such that students are engaged in increasingly successful learning experiences. Similarly, Joyce and Showers (2002) explain that professional development "is the primary vehicle for improving the knowledge and skills of both individuals and organizations and thus for increased student learning" (p. 188).

Purposes. The purpose of professional development is to affect student learning. Mizell (2010) posits that professional development enables educators to improve their skills and, in turn, boost student achievement. However, sustained instructional improvement requires "change in the classroom practices of teachers" (Kennedy, 2014, p. 690). As such, the ultimate goal of professional development is learning transfer or "the effective and continuing application by learners … of knowledge and skills gained in the learning activities" (Broad, 1997, p. 2).

Components. The research literature reveals four critical components of effective professional development. Figure 3 presents theory, demonstration, practice, and coaching as the components required to support learning transfer (Cooper, 2016).

Figure 3

Model for Effective Professional Development



The first component of professional development is theory. An exploration of the underlying theory is required such that teachers understand the rationale for the new instructional strategy or skill being presented (Cooper, 2016; Joyce & Showers, 2002). Furthermore, there must be a clear, discernable focus and deep implementation of a few instructional elements that can yield profound changes in professional practice (Sharratt & Fullan, 2009; Reeves, 2010; Marzano et al., 2005). As such, the learning must focus on curricular and instructional strategies

that have a high probability of advancing student learning (Hlas, 2021; Joyce & Showers, 2002). In other words, professional development should support instructional improvement via the exploration of high-leverage strategies (Patti et al., 2021; Kroeger et al., 2022). High-leverage strategies are those that powerfully promote learning (Garcia & Shaughnessy, 2015).

Second, training must involve dissemination of knowledge as well as demonstration or modeling (Joyce & Showers, 2002; Knight, 2021). Readings, discussions, and lectures are often utilized to explore both the concepts behind a strategy and the principles that guide its use (Joyce & Showers, 2002). Whether in person or through video, demonstrations facilitate learning by illustrating the skill or strategy in practice.

For high-impact learning to occur, training sessions must also provide teachers with an opportunity to translate newfound knowledge into immediate action via deliberate practice under simulated conditions (Reeves, 2010; Davis, 2015; Joyce & Showers, 2002; Knight, 2021; Garcia & Shaughnessy, 2015). "The more closely the training setting approximates the workplace, the more transfer is facilitated" (Joyce & Showers, 2002, p. 74). Such practice allows educators to develop the skills required for implementation. Continued application further ensures that new strategies are successfully integrated into the teacher repertoire, thereby resulting in genuine and sustained change (Chiu et al., 2021).

The final and most important component of effective professional development is coaching (Joyce & Showers, 2002; Knight, 2018). Coaching fosters professional learning through repeated opportunities to practice and refine specific instructional interventions by way of reflection and feedback (Garcia & Shaughnessy, 2015; Chiu et al., 2021). Furthermore, coaching provides sustained support via ongoing conversations about the strengths and weaknesses of the new strategies and/or the implementation process, allowing teachers to

celebrate their accomplishments and determine necessary modifications (Knight, 2018; Joyce & Showers, 2002).

Results. Both multidimensional training and coaching are essential to learning transfer. This is illustrated by Table 1, which depicts "the relationship between types of training outcomes (knowledge, skill, transfer) in terms of the percentage of participants likely to attain them when the combination of components are employed" (Joyce & Showers, 2002, p. 78).

Table 1

Training Components and Attainment of Outcomes in Terms of Percent of Participants

Components	Knowledge (thorough)	Skill (strong)	Transfer (executive implementation)
Study of Theory	10	5	0
Demonstrations	30	20	0
Practice	60	60	5
Peer Coaching	95	95	95

By extrapolating research and making professional judgments, Joyce and Showers (2002) estimate the effectiveness of training components. When professional learning is structured to provide theory, demonstrations, practice, and continued coaching, 95% of participants are expected to attain the knowledge and skills needed to change their instructional practices in ways that enhance student learning.

Knight (2007) reached similar conclusions after interviewing approximately 150 teachers regarding their views on professional development. Results reveal that coaching fosters learning transfer because sustained support makes it easier for educators to implement change initiatives. In fact, when coaching follows professional learning, "more than 90% of teachers embrace and implement programs that improve students' experiences in the classroom" (Knight, 2007, p. 4).

Coaching

The improvement initiative was also informed by the literature on coaching. Coaching is crucial to improvement efforts as it prioritizes personalized, sustained engagement in change initiatives. In fact, a growing body of research reveals coaching as an essential tool needed to support professional learning and continued development (Joyce & Showers, 2002; Knight, 2007; Cornett & Knight, 2009; Knight, 2018; Aguilar, 2013). However, the term 'coaching' is often used interchangeably with 'teaching,' 'tutoring,' and 'mentoring.' Consequently, it is important to provide a working definition for this study. Van Nieuwerburgh (2018) defines educational coaching as "a one-to-one conversation that focuses on the enhancement of learning and development through increasing self-awareness and a sense of personal responsibility, where the coach facilitates the self-directed learning of the coachee through questioning, active listening, and appropriate challenge in a supportive and encouraging climate" (p. 17).

While multiple coaching models exist, the purpose of each is to foster improvement. "Coaching is at its essence a nurturing structure, but it is also one where there is always a subtle push for change" (Aguilar, 2013, p. 15). Described as a vehicle for transformation, coaching encourages teachers to hone their craft and implement new skills that improve student outcomes (Knight, 2007). Such improvement is made possible because coaching promotes "conditions in which deep reflection and learning can take place, where a teacher can take risks to change her practice, where powerful conversations can take place, and where growth is recognized and celebrated" (Aguilar, 2013, p. 8). Following is a brief description of the most common coaching models in education: peer coaching, instructional coaching, and cognitive coaching, the latter of which is primarily used in this study.

Peer Coaching. Peer coaching is used to support teachers in implementing research-based practices. It involves colleagues collaborating with one another to "sustain commitment to learning and relate new approaches to every day practice" (Cordingley, 2005, p.73). Peers provide support to one another as they learn to master new knowledge and skills, collaborate to plan instruction, develop supporting materials, and examine the effect of new strategies or interventions on student learning. This form of coaching emphasizes modeling, observation, feedback, reflective dialogue, and classroom practice as teachers come together to reflect and refine their practice through structured conversation (Devine et al., 2013; Colucci, 2014). Joyce and Showers (2002) argue that collegial work focused on the mastery and use of innovative practices and concepts contributes to both the individual and collective competencies of participating educators.

Instructional Coaching. Instructional coaching is a partnership approach to facilitating change and improving instruction (Knight, 2011). It pairs an instructional coach with a collaborating teacher to successfully implement scientifically proven instructional practices that will have a positive impact on students (Knight, 2018). Instructional coaches have a broad knowledge of instructional issues and are able to share and model a variety of effective practices. However, they collaborate with teachers to analyze current instructional practices, set goals, identify the research-based interventions needed to meet established goals, and provide support until the goals are met (Knight, 2007).

Cognitive Coaching. Cognitive coaching is a "systemic, rigorous, and data-based" model that focuses on the improvement of an existing practice or repertoire via self-directed learning (Costa & Garmston, 2002, p. 5). Predicated on the assumption that beliefs influence behavior, the coaching process mediates improvement via mental resources and intellectual

functions (Costa & Garmston, 2002). In other words, cognitive coaches utilize a variety of prescribed techniques and structures to encourage educators to examine the thinking behind their teaching practices, thereby enhancing their capacity for self-directed learning and improvement. Costa and Garmston (2002) explain that "human beings construct their own meaning through reflecting on experience and through dialogue with others" (p. 7). Consequently, cognitive coaching involves the interrelated elements of a planning conversation, an event (usually a lesson that is observed by the cognitive coach), and a reflecting conversation which requires the teacher to engage in the practices of self-management, self-monitoring, and self-modification (Knight, 2007; Costa & Garmston, 2002).

Coaching Outcomes. Research details how coaching facilitates learning transfer and professional competencies. Showers (1984) revealed that coached teachers practiced new strategies more frequently than did uncoached teachers who had received identical training. As a result, those who were coached developed greater skill in the implementation of the new strategy. Coached teachers also exhibited clearer understandings of the purposes and uses of the new interventions. As such, they were more likely to explain new strategies to their students, thus enhancing the chance that students might better understand both the intervention and the required behaviors for successful integration (Baker & Showers, 1984). Joyce and Showers (2002) found that coached educators exhibited greater retention of new knowledge and skills than those who were uncoached. In their words:

> Six to nine months after training in several new models of teaching, coached teachers had retained and, in several instances, increased their technical mastery of the teaching strategies. Uncoached teachers, however, were in many cases unable to even demonstrate the new strategies after that period of time had elapsed. (p. 87)

Furthermore, coaching is linked to an increase in data-driven decision making as "effective coaching programs respond to particular needs suggested by data, allowing improvement efforts to target … strategic areas of need suggested by evidence, rather than by individual and sometimes conflicting opinions" (Aguilar, 2013, p. 9).

One of the most comprehensive studies on coaching was completed in 2004 by the Annenberg Foundation for Education Reform. This study yielded multiple findings that support the efficacy of coaching for both learning transfer and accountability. In fact, the likelihood of implementing new strategies into the classroom rises when colleagues, who are guided by a coach, are held accountable for improved teaching and learning. Coaching also promotes collaborative and reflective practices as educators work together to intentionally reflect on the application of their learning and its impact on students. Consequently, coaching advances a collaborative culture in which school staff take ownership in improvement efforts (Annenberg Institute for School Reform, 2004). As coaching relationships are established and nurtured, coaching structures prompt conversations that lead to pedagogical and behavioral changes that positively impact student outcomes.

Summary

Chapter II presented the literature that informed the study's overall theory of improvement as guided by the sociocultural approach to instruction which emphasizes learning via collaboration and discourse. Literature suggests that professional learning and subsequent coaching will lead to an instructional redesign in which teachers (a) plan lessons according to the GRR's four-step teaching method and (b) intentionally facilitate opportunities for collaborative inquiry and learning during the *We do it* and *You do it together* phases of instruction. The research literature also indicates that the implementation of new instructional norms, which

integrate social interaction and dialogue, will encourage students to develop practices for collaborative inquiry and learning that ultimately foster participatory learning. The action-oriented objectives for this study are as follows:

1. To design an intervention that might observe and evaluate teacher efforts to implement new instructional norms in the classroom.
2. To evaluate the extent to which the intervention can be successfully implemented and to identify the conditions that might facilitate or impede successful implementation.
3. To evaluate whether the intervention might generate desired outcomes and to assess the intervention's adaptability and utility for other contexts.

CHAPTER 3: METHODOLOGY

This improvement science study is designed to evaluate the research team's efforts to change instructional norms in the classroom. Using a multi-stage design, the research team trained, observed, coached, and interviewed teachers to understand the factors and dynamics that help or hinder their ability to foster collaborative inquiry and learning.

Research Design: Improvement Science

Rooted in the work of Deming (2018), improvement science is used across multiple disciplines to drive continuous improvement by tackling localized problems of practice. Perry et al. (2020) describe improvement science as a "rigorous and scientific methodology that encourages the integration of experiential knowledge with extant theory and applied social science inquiry" (p. 29). With respect to education, the improvement science framework guides "scholar-practitioners as they define problems, implement changes and determine whether or not those changes are actually improving outcome and practice" (Crow et al., 2019, p. 13). It offers tools for every stage of the improvement process, from problem definition to scaling up improvements.

The first step in improvement science is to define an actionable problem of practice (Mintrop, 2016). This involves the naming and framing of "a persistent, contextualized, and specific issue embedded in the work of a professional practitioner, the addressing of which has the potential to result in improved understanding, experience, and outcomes" (Perry et al., 2020, p. 41). Once a problem of practice has been identified, a causal systems analysis is used to uncover the problem's underlying causes (Perry et al., 2020; Bryk et al., 2017; Crow et al.,

2019). A fishbone diagram is developed to illustrate the varying root causes that contribute to the problem of practice. Shared construction of the fishbone diagram allows for multiple perspectives to be recorded as collaborators work together to uncover, organize, and summarize the knowledge regarding the problem's root causes. The five whys questioning technique is often employed as a strategy to promote deep understanding of the problem's causes (Crow et al., 2019; Perry et al., 2020). Finally, an interrelationship diagram (ID) may be used to graph possible cause-and-effect relationships that exist among the problem of practice and root causes. An ID allows collaborators to both analyze and quantify the relationship between causes, thereby identifying the root cause that has the greatest impact for improvement (Crow et al., 2019).

The second step in improvement science is to develop a theory of improvement and corresponding change ideas that are based on both professional knowledge and research literature. This requires a review of literature that is targeted, selective, and relevant to the improvement effort. Scholarly practitioners must analyze the literature, determine its pertinence, and apply findings via realistic and testable solutions to address the problem of practice (Perry et al., 2020). A driver diagram is an organizational tool that visually represents the working theory of improvement (Bryk et al., 2017; Perry et al., 2020; Crow et al., 2019).

A roadmap for action, the driver diagram contains an aim statement, primary drivers, secondary drivers, and change ideas. The aim statement must be measurable, providing a clear target for improving the problem of practice. The primary drivers (which evolve from the root causes) are a small set of improvement hypotheses or "the components that, when put in place, will logically lead to the goal being achieved" (Crow et al., 2019, p. 32). Primary drivers, however, are too general to direct change efforts, thus the development of secondary drivers (Bryk et al., 2017). Secondary drivers, or sub-hypotheses, activate each driver and "function as

key levers for productive change… Finally, building off each secondary driver, and moving into finer detail, are the actual change ideas to be developed, tested, and refined" (Bryk et al., 2017, p. 76).

The third step in improvement science is the systematic, methodical implementation and study of change ideas via PDSA cycles. The PDSA framework, which guides rapid learning, consists of four steps that are carried out repeatedly as small-scale testing evolves into systemwide implementation (Bryk et al., 2017). Planning (which was previously detailed) requires collaborating practitioners to examine the identified issue, brainstorming its causes and potential interventions (Crow et al., 2019). The Do stage involves the implementation of intervention as well as the collection of data and documentation of change efforts. Resulting data are analyzed during the Study stage to determine if the intervention was effective.

In the Act stage, practitioners reflect on what was learned in the previous stage. If the intervention and collected evidence are considered promising, then it justifies being scaled within the organization (Crow et al., 2019). If not, the intervention must be modified or completely altered before conducting a second PDSA cycle (Crow et al., 2019; Bryk et al., 2017). Once an intervention has been expanded to include the entire organization, continued monitoring is needed to promote against slippage, the gradual move backwards toward previous ways of doing things (Cohen-Vogel et al., 2014).

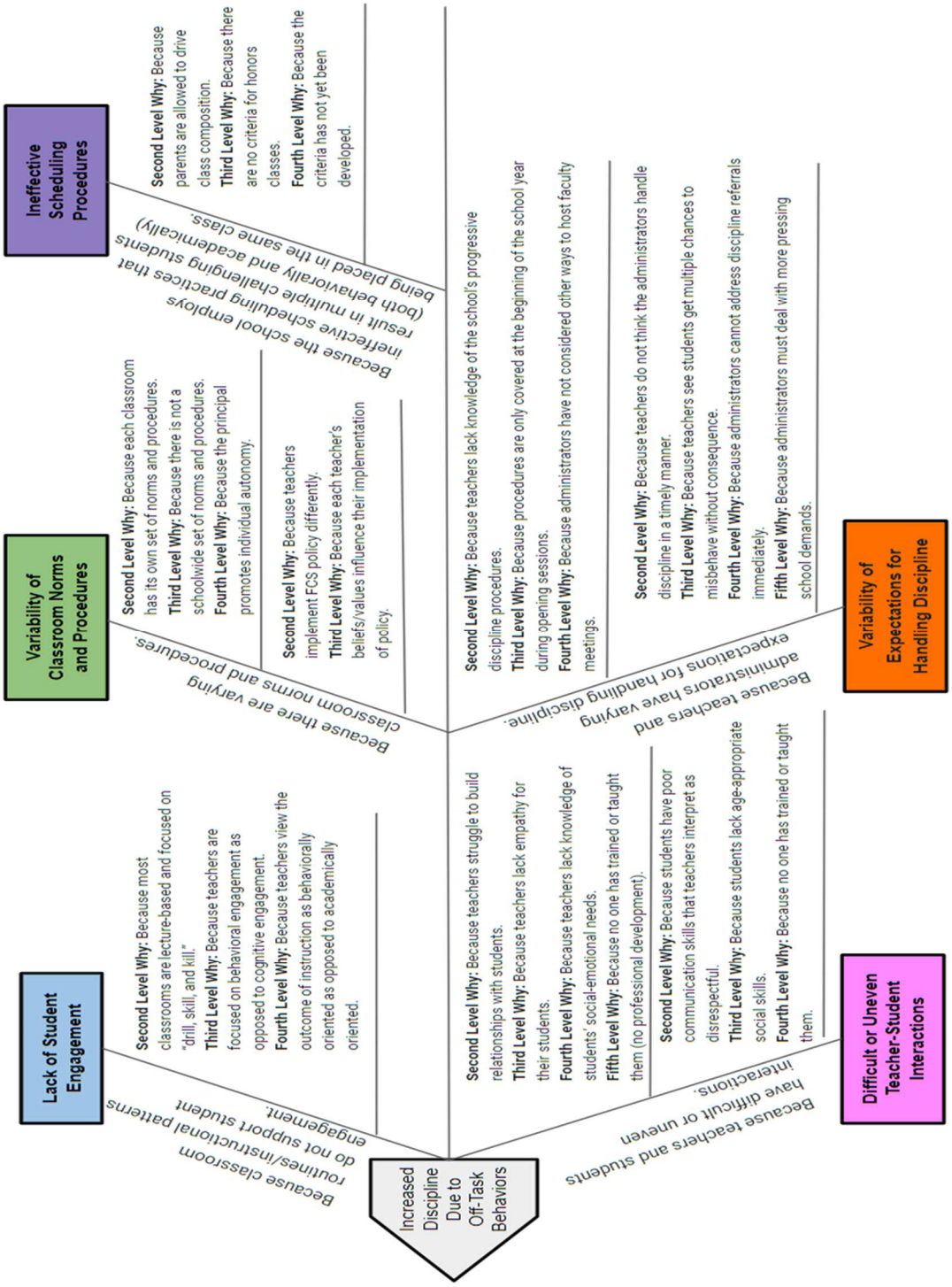
The final step of the improvement science process is to communicate findings to stakeholders and professionals outside of the organization (Perry et al., 2020). This last step is undertaken to promote more widespread distribution of ecologically-valid, practice-based knowledge, and, whenever possible, to contribute to the ongoing development of disciplinary knowledge (Bryk, 2015).

Defining a Problem of Practice

Consistent with improvement science methodology, the researchers first defined a local problem of practice – increased discipline referrals citing student off-task behaviors. A causal systems analysis was developed following 16 empathy interviews of students and faculty. These interviews were conducted to help determine the primary origins of the school's discipline challenges. The resulting root causes (along with minor causes identified via the five whys technique) were used to develop a fishbone diagram which is presented in Figure 4.

Figure 4

Fishbone Diagram



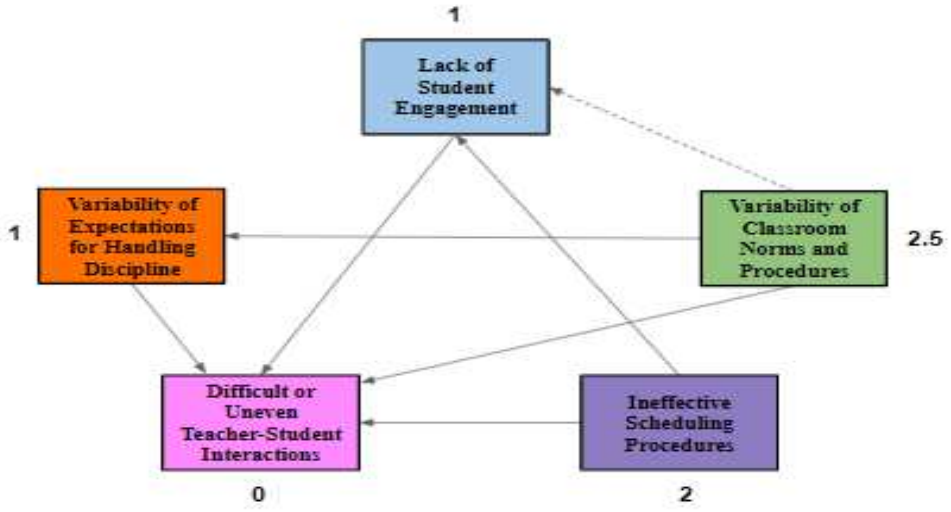
The five major root causes were as follows:

1. Lack of student engagement: Students confessed that they were not engaged in instruction. They spoke of an abundance of boring, busy work.
2. Variability of classroom norms and procedures: Respondents pointed to the fact that each teacher had differing academic and behavioral expectations. This is best captured by the student who explained that it depends on which teacher you have that determines if you get in trouble for certain things.
3. Ineffective scheduling practices: Teachers believed that classes were scheduled without regard to the students that comprise the roster. In other words, multiple challenging students (both behaviorally and academically) were placed in the same class, making it difficult to manage and provide a productive learning environment.
4. Difficult or uneven student-teacher interactions: Students admitted to responding disrespectfully to classroom teachers if they were offended or felt unheard. In addition, some students believed they were consistently judged by their worst behaviors.
5. Variability of handling discipline: Teachers mentioned the need for more immediate and consistent disciplinary action from the administrators. Likewise, teachers felt disciplinary consequences were ineffective because they did not deter subsequent inappropriate behaviors.

An interrelationship diagram (ID), displayed as Figure 5, was then developed to analyze and depict relations between the five root causes.

Figure 5

Interrelationship Diagram (ID)



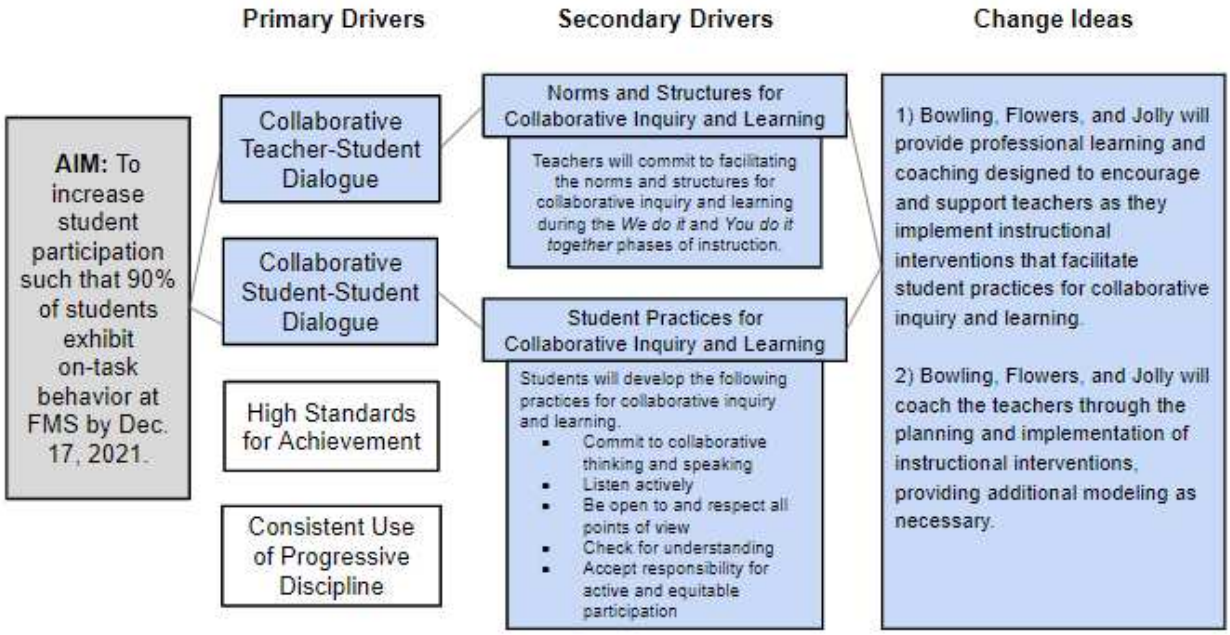
As noted in Figure 5, the research team identified variability in classroom norms and procedures as a primary contributor to increased discipline referrals citing off-task behaviors. Consequently, the area of classroom practice was targeted for the improvement work addressed in this dissertation. Specifically, the focus was on creating conditions to foster participatory learning such that students would engage in on-task behaviors as they collaborated with peers to achieve academic objectives.

Developing a Theory of Improvement

A thorough review of literature informed the development of a working theory of improvement. In particular, the researchers paired research-based knowledge with knowledge of the local system to create and refine a theory of improvement that targeted change in classroom practice. The final theory of improvement is visually represented by the driver diagram presented in Figure 6.

Figure 6

Driver Diagram



When read from right to left, the diagram indicates the change ideas or specific actions believed to advance the secondary drivers such that the primary drivers can be realized, thereby creating the conditions needed to satisfy the aim. As indicated by the blue shaded boxes, the researchers chose to focus initial change efforts on the high-leverage primary drivers of *Collaborative Teacher-Student Dialogue* and *Collaborative Student-Student Dialogu*e via the integration of classroom practices that engage students in collaborative inquiry and learning. By addressing the top two primary drivers, the researchers anticipated an instructional redesign that emphasized participatory learning, thereby paving the way towards the project's aim. In other words, as students became more engaged in their learning, we expected students to exhibit more on-task behaviors.

A detailed explanation of the theory of improvement follows, beginning with the change ideas. Research reveals that "curricular/instructional change, mediated through well-designed

staff development, can have a major and rapid effect on student learning" (Joyce & Showers, 2002, p. 7). Consequently, the researchers designed and delivered professional development that engaged teachers in the study and practice of the following strategies that can be applied across curriculum areas: (a) the use of the GRR to plan lessons that encourage student participation during the *We do it* and *You do it together* phases of instruction; and (b) the integration of collaborative learning structures and conversation stems during the *We do it* and *You do it together* phases.

In order to facilitate the implementation of these strategies, the researchers supplied participating teachers with a common learning plan template that details the GRR's four phases as well as the following instructional aids: anchor charts that display the four main conversation stems; collaborative placements which aid in the management of small groups activities; and flip charts that students can utilize to access additional conversation stems as well as the prescribed practices for inquiry and learning. These materials were valuable resources as participants intentionally planned for and facilitated collaborative inquiry and learning during the *We do it* and *You do it together* phases of instruction. Presented in Table 2, teachers employed the collaborative learning structures and conversation stems during the *We do it* portion of the lesson in order to model collaborative learning practices in a whole group setting.

Table 2

Collaborative Learning Structures and Conversation Stems

Collaborative Learning Structures	Conversation Stems
A/B Partners	I would like to add…
Single Round Robin	I agree because…
Continuous Round Robin	I respectfully disagree because…
Timed Round Robin	I have a question…
Think-Write-Round Robin	

Teachers also integrated these instructional strategies during the *You do it together* phase of learning. By doing so, they encouraged students to engage in the prescribed practices for collaborative inquiry and learning that are depicted in Table 3.

Table 3

Student Practices for Collaborative Inquiry and Learning

Desired Student Practice	Description of Practice
Commit to collaborative thinking and speaking	Contribute your ideas to group dialogue. Connect to the thinking of others when possible.
Listen actively	Listen with an open mind and without thinking of what you'll say next. Set aside judgement to listen to others and to yourself more deeply. If you feel judgmental or defensive, ask yourself… • "I wonder what brought her to this belief?" • "I wonder what he's feeling right now?" • "I wonder what my reaction teachers me about myself?"
Be open to and respect all points of view	Listen to understand perspectives that differ from your own. Better understand each person's thinking by asking, "What makes you say that?"
Check for understanding	Before countering or adding to another's comment, be sure you fully understand what has been said by paraphrasing and posing questions for clarification.
Accept responsibility for active and equitable participation	Encourage those who are not speaking to offer their perspectives. Monitor your own speaking – voicing, but not dominating.

Coaching was the key to this change idea. Throughout the duration of the study, coaching was used to support teachers as they planned for and implemented the instructional interventions that facilitate student practices for collaborative inquiry and learning. Such support involved modeling, observation, feedback, and reflective dialogue as the researchers and participating teachers came together to reflect and refine instructional practices through structured conversation.

Plan for PDSA Cycles

Although the research site was predetermined due to the nature of the study, the researchers were purposeful in the selection of participants for the initial PDSA cycle. Likewise, the researchers intentionally designed the procedures for data collection and analysis.

Research Site

The study was conducted at Florence Middle School (FMS), a large middle school in northwest Alabama that serves a diverse population of approximately 700 seventh and eighth graders. Regarding demographics, minority students comprise 53% of the population; 51% of the student body is economically disadvantaged; and there is a slightly higher percentage of males (52%) than females (48%).

The school is staffed by two administrators, two guidance counselors, five instructional support staff, three office staff, one instructional partner, one media specialist, and 52 teachers. Several structures exist to encourage and support teachers in their development of curriculum, including an employee calendar that incorporates 13 professional development days, four data days, and two teacher workdays. Core content teachers have daily common planning as well as scheduled time with the instructional partner on Wednesdays. During common planning, teachers analyze student work and use resulting data to inform future lesson plans and assessments. While teachers currently have the autonomy to choose supplemental resources and integrate instructional strategies of their choice, departmental staff are encouraged to use the same lesson plans. This ensures that all students within the same grade receive similar instruction in the same content area.

Participants

Participants are current employees of FMS, teaching either English, math, or science. A total of nine teachers were asked to take part in the first PDSA cycle, but only seven agreed to participate. Regarding the seven participants, one was a black female and six were white females.

I worked primarily with the two seventh-grade science teachers, henceforth referred to as Jill and Wendy. Jill has taught for 19 years in total, working at FMS for the last 17 years. As the seventh-grade honors science teacher, Jill primarily works with advanced students. Wendy has been an educator for 20 years, teaching 16 years at FMS. She works with lower level and inclusion students.

Procedures

I implemented the first PDSA cycle with two seventh-grade science teachers in the fall of 2021. While it was anticipated that the initial cycle would last four to six weeks, it took approximately 12 weeks thanks to unforeseen circumstances. During this time, I gathered the data needed to (a) analyze the extent to which the interventions were or were not effective and (b) determine modifications needed for the second PDSA cycle.

It is important to note that the other two members of the research team implemented PDSA cycles with English and math teachers during the same time frame. Although working separately, our research team compared notes concerning successes and difficulties in the implementation of change efforts across the different subject areas. Despite the unpreventable setbacks we encountered during the first PDSA cycle, the long-term goal is to scale up the initiative to include the entire faculty. In doing so, all FMS students will be exposed to the practices for collaborative inquiry and learning. Throughout the duration of future cycles, the

researchers will continue to monitor progress in order to ensure the intervention is implemented across the site with relative consistency (Crow et al., 2019).

Positionality Statement

I serve as the media specialist at FMS. However, I am also a member of the leadership team. I believe my current role positively affected the execution of the study. Not only had I already established rapport with the participants, but, in their eyes, I am a colleague with equal stature. As such, the participants openly shared their thoughts regarding the intervention, its implementation, and outcomes. Furthermore, by assuming the stance of *observer as participant*, I was able to "observe and interact closely enough with [participants] to establish an insider's identity" without participating in the actual implementation of the instructional interventions (Merriam & Tisdell, 2016, p. 145).

As a leader-interventionist and researcher, my primary objective was to foster change by developing and supporting the implementation of interventions that reorient staff toward new instructional norms that facilitate collaborative inquiry and learning among all students. Obviously, I hoped the proposed interventions would be effective. However, I could not let my desires shape the study's outcomes. Rather, I guarded against confirmation bias, making sure not to seek out evidence that supported my preferred conclusions, thereby ignoring other important data.

In addition, personal and professional experiences allow me to speak to the impacts of both engaged and disengaged learners. However, I did not share these experiences with participants. Instead, I approached coaching sessions and each structured interview carefully in order to avoid influencing the participants' responses. In fact, it was of utmost importance that I

identified and monitored my subjectivities as much as possible so as not to unduly bias the research process.

As a leader-interventionist, coach-participant, and researcher, I collected and subjectively analyzed multiple data sources to evaluate the process, mechanisms, and necessary conditions needed for the intervention to be scaled up.

Data Collection and Analysis

Multiple data sources were collected and analyzed in order to attend to the study's research objectives. The data sources included weekly lesson plans, classroom observations, coaching transcripts, and teacher interviews.

Teacher lesson plans were accessed via a shared drive within the FMS Google Drive. The researchers utilized the appropriate FMS shared drive to access and print each teacher's weekly lesson plans. These were available for download and subsequent review by 8:00 am each Monday. Weekly lesson plans were examined throughout the PDSA cycle. Regarding the analysis of lesson plan data, the researcher checked each lesson for the inclusion of the *I do it, We do it, You do it together,* and *You do it alone* phases of the GRR as well as opportunities for collaborative inquiry and learning during the *We do it* and *You do it together* phases of instruction. Colleague checks were completed to verify lesson plan analysis, thereby enhancing believability.

The researcher conducted and documented observations in each of the two science classrooms. When possible, biweekly observations were conducted throughout the PDSA cycle. All observations required consistent use of two researcher-created observation tools. The first, an observation rubric, was used to document and describe evidence of the implementation of structures for collaborative inquiry and learning (see Appendix I). Resulting data was analyzed

according to the level of implementation (i.e., evident or not evident) of established structures. During the *You do it together* phase of observed lessons, the researcher utilized a similar observation tool to tally and document evidence of group dialogue, active listening, checking for understanding, and respectful and equitable participation (see Appendix II). Data from this observation tool were analyzed to determine the frequency with which students exhibited the practices for collaborative inquiry and learning. Regarding observation data, colleagues were asked to scan the raw data and assess whether findings were plausible. The researcher's notes and documentation of observed practices were then coded and organized into common themes, to provide a comprehensive picture of student engagement in collaborative inquiry and learning.

In addition, the researcher conducted biweekly coaching sessions with the teachers during their planning period. These sessions, which were conducted individually, were typically audio recorded to preserve the participants' responses for transcription and analysis. On the few occasions that recording was not practical, the researcher made copious notes, often penning the respondent's exact quotes. Each coaching session followed the same protocol, utilizing open-ended questions designed to elicit insider perspectives on the implementation, strengths, and weaknesses of the interventions (see Appendix III).

Likewise, the researcher conducted and recorded individual teacher interviews at the end of the PDSA cycle. These in-depth, structured interviews utilized the same set of questions designed to garner information regarding the study's instructional interventions (see Appendix IV). Interview transcripts were analyzed with the purpose of learning (a) how teachers make sense of the new instructional practices, and (b) what practices and conditions might enable scale up. Analysis of both the coaching and interview transcripts required multiple passes. The first pass focused on identifying and labeling codes. Subsequent passes were directed at clarifying

codes, establishing themes, and drawing conclusions. Member checking was used to preserve credibility of findings.

Standards of Rigor

The researcher utilized various techniques to enhance the reliability and validity of research methods and to establish credibility. To begin, coaching conversations and final teacher interviews were conducted in accordance with the IRB-approved probing questions, thus increasing the reliability or consistency of data collection methods. Colleague checks were implemented to enhance the validity of data analysis with respect to lesson plan data and observational data. Similarly, member checking was employed to garner respondent validation of coaching and interview data. Finally, peer debriefing was used to establish credibility in the research process and results as a qualified, impartial colleague reviewed the study's methodology, data, and findings.

Additionally, throughout data collection and analysis, the researcher made memos to record the thoughts and decision-making processes that influenced the final conceptualization. These memos aided in the presentation of a data audit trail which increased the trustworthiness of the findings. Furthermore, the triangulation of multiple data sources provided a more comprehensive picture of the improvement science project, thus enhancing the study's credibility.

Summary

Chapter III began with a discussion of improvement science. The study's problem of practice was defined, and the development of the theory of improvement was detailed. A plan for the PDSA cycles was presented, detailing the research site, participants, procedures, positionality statement, data collection and analysis, and standards of rigor.

CHAPTER 4: PRESENTATION OF RESEARCH

The first PDSA cycle was conducted at FMS during the fall of 2021. The research team aimed to initiate change by utilizing professional learning and coaching to support teachers as they redesigned instruction to facilitate collaborative inquiry and learning. Although there were seven participants in the initial PDSA cycle, I worked with the two seventh-grade science teachers referred to as Jill and Wendy. Throughout the study, I collected and analyzed weekly lesson plans, classroom observation data, and transcripts from coaching sessions and final teacher interviews. The purpose of this chapter is to (a) evaluate the extent to which the intervention was successfully implemented, (b) identify the conditions that facilitated or impeded successful implementation, and (c) evaluate whether the intervention generated desired outcomes.

Assumptions

The 2020-2021 school year was overshadowed by COVID-19. The pandemic altered education for both teachers and students as masks, social distancing, contact tracing, and virtual learning became commonplace. In order to keep kids engaged and enrolled in school, extended deadlines were granted and grade recovery was offered via the resubmission of assignments and test corrections. FMS teachers felt as though they were drowning in work and barely able to keep their heads above water. When the last student left on the final day of school, it was as if a weight was lifted from the teachers' shoulders. I watched my colleagues celebrate the end of a stressful year, hopeful that school would return to normal in August.

I, too, anticipated more normalcy with the start of the 2021-2022 school year. Without a mask-mandate, I returned to school excited to see the smiling faces of my colleagues. I rearranged the library, pulling chairs out of storage and unboxing makerspace resources that had been stowed away during COVID. Likewise, several of my colleagues rearranged their rooms to accommodate small group seating as we assumed cooperative learning would be possible once again.

Expectations

With the way the school year was progressing, I expected to successfully implement the initial PDSA cycle on a strict timeline. This optimism was unwavering even though I was only able to secure the consent of two of the three science teachers I had intended to engage in the intervention.

On Thursday, August 12, 2021, I joined forces with my co-investigators to deliver the initial professional development session for participating teachers. This session was designed to emphasize the following strategies: (a) the use of the gradual release of responsibility to plan lessons that encourage student participation during the *We do it* and *You do it together* phases of instruction; and (b) the integration of collaborative learning structures and conversation stems during the *We do it* and *You do it together* phases. In pursuit of this goal, we supplied participants with a common learning plan template that detailed the GRR's four phases as well as multiple instructional aids. All teachers said they were willing to post the anchor charts, utilize the collaborative placemats for small group activities, and provide students with access to the flip charts. With such positive feedback, I became increasingly excited about the study. I anticipated the weekly observations and subsequent coaching sessions to take off without a hitch. Unfortunately, I was mistaken.

Reality

The following week, Florence City employees were notified of a district-wide mask mandate and the need to "space seating/desks at least 3 feet apart when feasible" (Florence City Schools, 2021, p. 7). Such restrictions were problematic because they created a structural impediment to student dialogical practices for collaborative inquiry and learning. My excitement immediately wavered as I quickly began to question whether our intervention was something that could be reasonably implemented and managed. It turned out that masks and seating assignments were not all that I had to worry about.

Sadly, my teacher participants faced multiple unforeseen obstacles at the beginning of the year. To begin, they were tasked with learning how to navigate and utilize two new technology platforms: PowerSchool, a student information system, and SchoolCity, an online assessment tool. The required training consumed their time and made for a frustrating learning curve. Like many schools across the nation (Paterson, 2021), FMS experienced a dire substitute shortage during the first nine weeks. As a result, teachers were frequently asked to cover classes during their planning periods. This deprived them of the opportunity to plan with colleagues, prepare lessons, grade assignments, enter grades, etc. When describing the nonstop frenzy, one teacher said, "I feel like I'm on fire from the minute I walk into the building until the moment I walk out."

Two months into the study, technology hurdles and substitute shortages seemed to subside. However, participants still faced multiple challenges. They continued to express frustration that their lesson plans had to be timestamped and uploaded for administrative review. They were also frustrated that, once their lesson plans were developed, they still had to create the

corresponding instructional content for students to access via Canvas. Teachers reported that this planning process took up to four hours to complete.

In addition, teachers were overwhelmed by the pressure to close the achievement gap. The i-Ready reading diagnostic data from August 2021 indicated that 71% of FMS students were reading below grade level, with 51% categorized as three or more grade levels below targeted proficiency. With a new school wide focus on comprehension of informational text, all teachers were expected to purposefully integrate reading instruction into their curriculum. Though understandable, this mandate represented yet an additional responsibility for the teachers as they aimed to teach the required science standards to a group of struggling students. As Wendy explained, "Every week it's something new. Every week it's one more thing. Every week!" It is no wonder that the participants, who were once enthusiastic about the study, came to dread my visits. The coaching sessions, in particular, became just "one more thing" to add to their hectic schedules.

What We Planned vs. What Actually Happened

Jill and Wendy were engaged at the initial professional development and training session. They took notes, asked questions, offered insights as needed, and collected the supplies we provided to them. Without further direction, they posted the anchor charts in their classrooms and modified the collaborative placemats to organize student seating. Since the science rooms contained seven, 4-person lab tables, the teachers assigned each table a color and labeled the corresponding seats from one to four. Visual representations of the participants' collaborative groups are presented in Figures 7 and 8.

Figure 7

Jill's Collaborative Groups

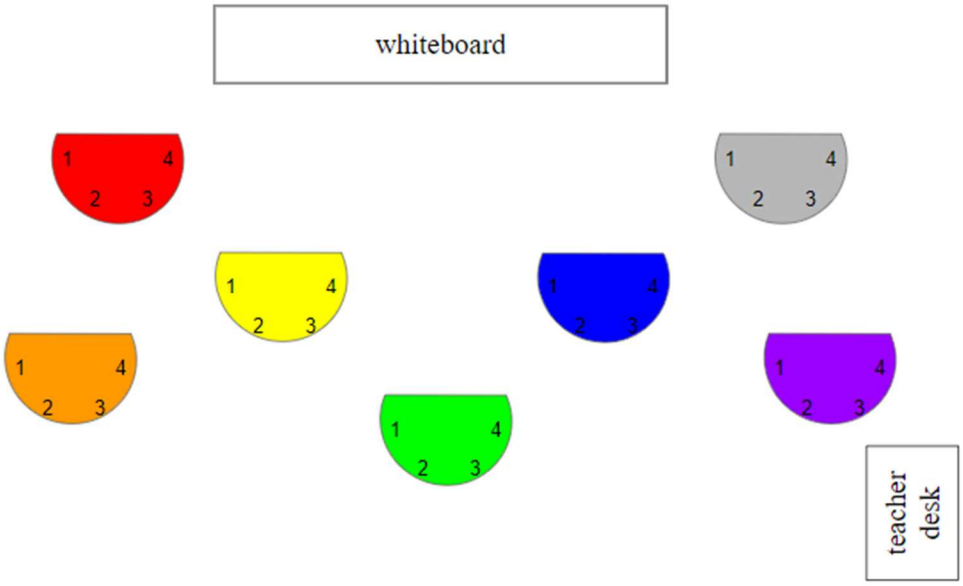
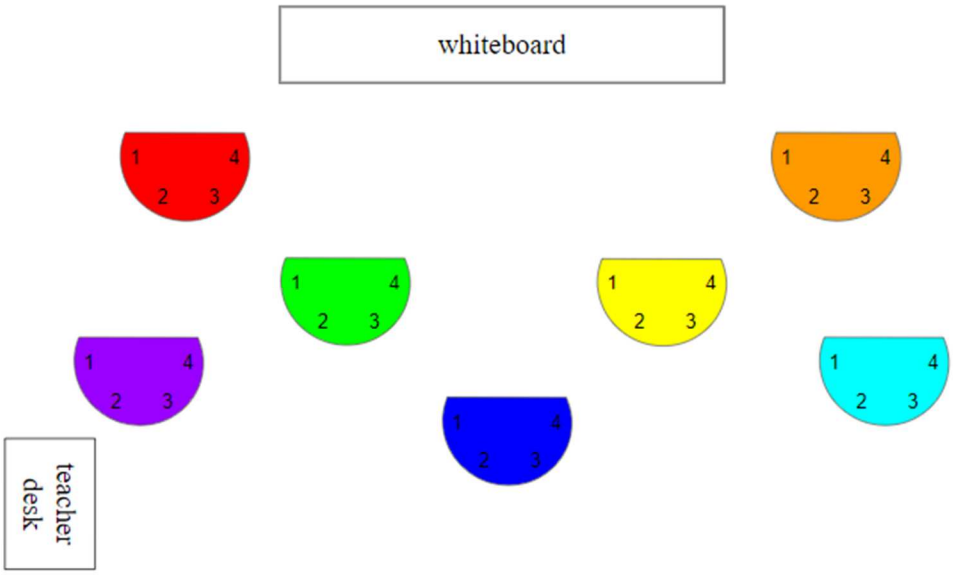


Figure 8

Wendy's Collaborative Groups



My first classroom observations in mid-September of 2021 left much to be desired. The previously-posted anchor charts were no longer displayed in either room and flip charts were nowhere to be seen. Jill's students were involved in group work that failed to yield equitable

participation or respectful dialogue; and Wendy's students were attempting to complete an individual assignment in the midst of multiple side conversations and off-task behaviors. In fact, the only evidence of implementation of the norms and structures for collaborative inquiry and learning were the modified collaborative placements that remained at each lab table.

Initial Misconception: Group Work Equals Collaboration

A review of observational data revealed that teachers shared an understanding that group work would yield student collaboration by itself. I was surprised by this misunderstanding because the teachers were trained to recognize that multiple factors are needed to effectively engage students in shared activities and productive discourse. Clearly, Jill and Wendy did not "take-up" this part of the training.

Group Work Goes Awry. Our intervention was structured around the working proposition that new classroom structures and processes were needed to promote equitable student collaboration and dialogue in the classroom. Without such structures, we suspected that, even the most well-planned group activities would not afford the kind of group dialogues we were looking for. This is exactly what I observed during my first observation in Jill's classroom on September 13th.

During the *You do it together* phase of learning, student groups were directed to rotate numerically through six stations covering the characteristics of life. Referencing the collaborative placemats, Jill directed, "Student1 is in charge. You are responsible for reading directions and distributing supplies. When you rotate, the same student can sit in seat one or you can change it up." Jill then told the students to begin, and she set a timer on her phone for five minutes.

This process differed from our desired intention. Our protocol directed teachers to structure collaborative learning opportunities such that all students participated equally. Since Jill did not properly instruct students to alternate leadership roles as they transitioned from station to station, participation in the activities was not equitable. In fact, observational data indicated that, in most groups, the same one or two students always took the lead, dominating both the conversation and the activity. As a result, some students completely opted out of the assigned tasks, proving that group work alone does not guarantee collaboration.

Group Work Transforms into Individual Work. The model and our accompanied intervention was based on the proposition that teacher monitoring and facilitation are necessary components for student collaborative inquiry and learning. When discussing the expectations associated with being a facilitator of learning, Jill spoke of the need to actively monitor the progress of each group. She explained,

> Just because I don't stand up there and teach the whole 50 minutes, I still have to be present the whole time. I have to walk around the room to make sure that the students are on task. If there's any kind of distraction within a group, I have to refocus them. And if there's any kind of argument, I remind them of problem-solving and conflict resolution skills.

If the teacher fails to monitor student interaction and dialogue, collaborative activities may fail. This is exactly what happened in Wendy's classroom during my second observation on September 24th. Student groups were instructed to choose one of three ReadWorks science passages, read it alone, and then work together to answer the corresponding questions. However, most students worked alone. The two boys working at the table closest to me scanned their chosen passage and quickly selected answers independently of one another. Once complete, they

shared their answers. When their responses differed, they proceeded in one of two ways. On occasion, they discussed the reasoning behind their choices before one or the other changed his answer, but they never returned to the passage to verify their answers. More often, however, one of the boys simply changed his answer in order to comply with his partner.

Although the students communicated enough to submit similar answers as their final products, they were not engaged in a joint intellectual endeavor to gain knowledge. In fact, they neglected to put forth the effort needed to ensure they arrived at the correct answers. Without redirection from Wendy, group work quickly transformed into solitary, half-hearted attempts to complete the task at hand.

Researcher Response to Teacher Misconception

My primary goal for the follow-up coaching session was to refocus intent of the intervention and support each participant's efforts to implement the proposed instructional practices. To do so, I offered to visit their classrooms in order to introduce the project to the students, describe the practices for collaborative inquiry and learning, and model various collaborative learning structures. Both participants took me up on my offer, and I scheduled my visits to accommodate their schedules.

Proper Introduction to Collaborative Inquiry and Learning. Although I met with different classes, I utilized the same agenda in order to maintain consistency. Following a brief introduction, I explained to the students that their teacher and I were teaming up to find new ways to engage them in instruction. Our goal was to create collaborative activities that would require students to talk about the course material as well as what they were learning. I then referenced the poster with the Student Practices for Collaborative Inquiry and Learning, detailing and modeling the expectations associated with each of the desired practices.

Next, I acknowledged the fact that, as a shy middle schooler, I often found it difficult to talk to my classmates. I also worried about how my peers would respond to me. As a result, it was very important to me that students learn how to initiate dialogue and respond respectfully to one another, thus the Student Stems for Conversation. Using a volunteer, we modeled the use of conversation stems during a 60-second Rally Robin in which we discussed our favorite foods. The activity garnered a few giggles from our audience, but encouraged multiple students to volunteer for the next demonstration.

I selected three students to join me at the front of the room, and we completed a Round Robin regarding our favorite holidays. Designed to provide equitable participation, this structure allowed each of us 60 seconds to present our point of view. I began the activity and dialogue continued clockwise around our small group. Throughout the discussion, we used conversation stems and intentionally modeled active listening. Likewise, the students demonstrated collaborative thinking and speaking as they connected their thoughts to individuals who had spoken before them.

Finally, I initiated a small group Round Robin such that all learners could participate in a structured collaborative activity. Sitting at their assigned lab tables, each group member was given 60 seconds to discuss what they liked best about Florence Middle School. While monitoring discussions, I realized the students were excited to talk about a topic that was both personal and relevant. In fact, I needed to remind a few eager students of the need to listen actively as opposed to interrupting their tablemates. Otherwise, the Round Robin was successful as students were engaged in a collaborative activity that required purposeful discourse.

On my way out of Wendy's room, one of the students asked if I would come back the next day. Later that afternoon, a different student stopped me in the hallway. He wanted to know

when I would visit again because he was ready "to have more discussions." Each of these interactions left me hopeful as I could tell the students craved future opportunities for collaboration. Despite the student excitement in each classroom, Jill and Wendy progressed in very different ways.

A Giant Leap for Instructional Redesign

Subsequent observations and corresponding coaching sessions revealed that Jill entered the study with a genuine desire to advance student learning. As such, she planned lessons according to the GRR framework, intentionally chunking lessons to include all four phases of learning. She engaged students in purposeful learning opportunities, frequently incorporating *You do it together* activities that required dialogue. She was open to coaching and willing to try new instructional strategies. As the study progressed, Jill even introduced jobs within student groups in an effort to hold all students accountable for their participation. In addition, she became increasingly cognizant of the need to remind students to utilize the conversation stems that were both posted on the wall and available via the flip charts. As a result, Jill's classroom became a learning environment in which all learners were expected to actively engage in collaboration and dialogue. Table 4 presents compiled observational data documenting evidence of the implementation of norms and structures for collaborative inquiry and learning in Jill's classroom.

Table 4

Observation of Norms and Structures in Jill's Classroom

	Evident (+)/Not Evident (-)					
Norms and Structures for Collaborative Inquiry and Learning	**OBS 1**	**OBS 2**	**OBS 3**	**OBS 4**	**OBS 5**	**OBS 6**
An anchor chart with the four main conversation stems is posted in the room.	–	–	+	+	+	+
Collaborative placements are visible at all student groups.	+	+	+	+	+	+
Each student has access to a flip chart that provides the four main conversation stems, additional conversation stems, and the student practices for inquiry and learning.	–	–	+	+	+	+
The teacher and students use conversation stems during the *We do it* phase of instruction.	–	–	+	+	+	–
Students utilize conversation stems during the collaborative activities that comprise the *You do it together* phase of instruction.	–	–	+	+	+	+
The teacher controls group conversation structures.	–	+	+	+	+	–

An Impasse in Instructional Redesign

Wendy, on the other hand, was less ambitious. Wendy used the GRR framework to plan, but her lessons were geared toward individual work. Consequently, *You do it alone* activities dominated the majority of her lessons. Even though Wendy was willing to meet for coaching, she was often preoccupied and spent a great deal of time complaining. On two separate occasions, she lamented, "I'm done." In response, I tried to redirect the conversation by celebrating small successes and asking how I could help. Despite my best efforts, Wendy's

pessimism prevailed and, with the exception of one observed lesson, her instructional practices remained static. Her students, therefore, were usually expected to work individually on tasks that prompted the memorization of facts. Table 5 displays compiled observational data documenting evidence of the implementation of norms and structures for collaborative inquiry and learning in Wendy's classroom.

Table 5

Observation of Norms and Structures in Wendy's Classroom

	Evident (+)/Not Evident (-)					
Norms and Structures for Collaborative Inquiry and Learning	**OBS 1**	**OBS 2**	**OBS 3**	**OBS 4**	**OBS 5**	**OBS 6**
An anchor chart with the four main conversation stems is posted in the room.	–	–	+	+	+	N/A
Collaborative placements are visible at all student groups.	+	+	+	+	+	N/A
Each student has access to a flip chart that provides the four main conversation stems, additional conversation stems, and the student practices for inquiry and learning.	–	–	–	–	+	N/A
The teacher and students use conversation stems during the *We do it* phase of instruction.	–	–	–	+	–	N/A
Students utilize conversation stems during the collaborative activities that comprise the *You do it together* phase of instruction.	–	–	–	+	–	N/A
The teacher controls group conversation structures.	–	–	–	+	–	N/A

Life Happened. It is important to note that life threw Wendy multiple curveballs throughout the course of the study. In fact, she was confronted with various professional and personal obstacles during the fall semester. In addition to the professional hurdles previously

mentioned, Wendy was asked to serve as a Peer Helper Program Coordinator. While initially excited by the challenge, she quickly learned that it was both time-consuming and difficult to effectively support a new club, especially with limited resources. This extra responsibility became an additional stressor during what was already a demanding school year.

In addition to professional issues and constraints, Wendy's personal life was also challenged. Two members of her nuclear family contracted and struggled to recover from COVID. One of them experienced long-term effects which required several visits to specialists out of the area, causing Wendy to miss multiple days of school. Just when it appeared as though positive change was on the horizon, Wendy's mother passed away. Upon returning from this devastating loss, Wendy often felt overwhelmed and unmotivated. She frequently operated in survival mode, sacrificing excellence for "good enough" in an attempt to make it through the day.

Confronted with multiple setbacks and the upcoming winter break, Wendy and I resolved to end the PDSA cycle prior to the sixth observation. Although she was unable to consistently implement the proposed norms and structures for collaborative inquiry and learning, she understood the benefit of integrating them into her instructional practices. During her final interview, she even spoke of her intention to incorporate "more group work so they [students] can build both collaborative skills and communication skills."

Thematic Presentation of Data

Throughout the study, the researcher analyzed weekly lesson plans, field notes from classroom observations, and transcripts from both coaching sessions and teacher interviews. Data were coded and organized into common themes to provide insight into the implementation of instructional norms for collaborative inquiry and learning. The following textual presentation

largely spotlights Jill as she was the only participant to develop the capacity to effectively integrate the practices that foster collaborative inquiry and learning.

Collaborative Learning Structures Ensure Equitable Participation

Designed to engineer student interactions, collaborative learning structures ensure that each learner is engaged, makes an independent contribution, and participates equally. After our first coaching session, Jill intentionally and consistently utilized such structures in her classroom. During the study, I observed her use of A/B Partners, Numbered Heads Together, and the Take and Pass writing strategy to control group conversations. Perhaps most successful, however, was her integration of student jobs. As evidenced below, student jobs promoted equitable participation as the assigned roles provided each learner with a specific avenue for participation. In other words, when the instructional intervention was implemented as designed, our work appeared to achieve desired changes in student learning practices and outcomes!

When I entered Jill's room for the fourth observation on November 9th, I immediately sensed an air of excitement. Clearly, the students were anxious to complete the experiment referenced in the *You do it together* portion of the day's lesson plan. While giving instructions, Jill used the collaborative placemats to assign each student a job. Student1, the materials manager, was responsible for picking up and distributing materials. Student2 was given the role of taskmaster and was asked to keep group members focused on the task at hand. Finally, Student3, the time keeper, was responsible for keeping track of the time.

Prior to allowing the students to begin the experiment, Jill reminded students of their aim as well as the norms and practices for collaborative inquiry and learning. "Remember, your goal is to determine which solution contains the digestive enzyme, amylase. Taskmasters, you're

supposed to lead the discussion within your group. Recall the student stems for conversation as you're interacting with one another."

I closely observed the gray group while they were conducting the experiment. With three tablemates and three solutions, the taskmaster ensured that each person tested one solution. Not only were their interactions respectful, but it was clear that they learned from one another when engaged in controlled, purposeful dialogue.

After completing and cleaning up the experiment, Jill instructed the students to work with their tablemates to record their claim, evidence, and reasoning. I situated myself next to the blue table in an attempt to observe their interactions. Much like the students working at the gray table, members of the blue group fulfilled their roles and consistently utilized conversation starters, seeking input and clarification from one another throughout the exercise. Although each student had a different task, they functioned as a group to conquer a common academic goal while constructing their own understanding of curricular content.

As the semester progressed, Jill continued to incorporate student jobs during the *You do it together* phase of learning. As such, the students became both familiar with and comfortable executing the assigned roles. My field notes suggest that some students even internalized the required responsibilities. During my final observation on December 14th, students worked in pairs to complete an assessment on the respiratory and circulatory systems. Without being told to do so, Purple4 assumed the role of taskmaster and Purple3 took on the role of timekeeper. As such, Purple4 always read the questions aloud, and Purple3 kept a countdown, frequently reminding his partner of how much time they had remaining.

Interview data supports my observational findings indicating that collaborative learning structures tend to promote equitable participation during shared activities. More concretely, my

interviews with teachers reveal that collaborative inquiry and learning flourishes when students are held accountable for their individual contributions to the group. As Jill explained,

> I think they help the students to be more engaged in the lesson. This is especially true for the quiet kids who might normally try to hide. They can't really hide anymore. They have to participate because they know that their group members are relying on them.

In sum, collaborative learning structures are required to successfully facilitate student learning via collaboration and discourse. These findings confirm the literature regarding instructional norms, specifically the need for behavioral expectations focused on acting responsibly and treating others with respect (Good & Brophy, 2000). Likewise, such norms must be applied repeatedly so students embrace prescribed practices and enact them spontaneously (Chang & Song, 2016).

Conversation Stems Promote Dialogue

The data consistently supported the importance of conversation stems for prompting students' collaborative engagement. This finding was perhaps the most evident in my field notes. There, I consistently noted how conversation stems provided students with a way to initiate dialogue and encourage respectful discourse at the same time.

Conversation Stems Create a Safe Space for Collaboration. As previously documented, Jill was the best at reminding students to utilize the conversation stems when interacting with one another. Such was the case during my third observation on October 29th when she pointed to the anchor chart and said, "Remember your discussion prompts when sharing." This statement preceded the Numbered Heads Together activity during which tablemates were expected to "put their heads together" to discuss and record their answers

concerning the narrowing of the digestive tract. While seated near the green table, I overheard the following conversation.

> Green1: I think it gets more narrow because the food becomes smaller as it travels downward.
>
> Green3: I think it changes size because God made it that way.
>
> Green2: I respectfully agree with you Green3, but I think Green1 is correct. He has a more scientific answer.

I was amazed at the drastic, positive change in dialogical practices within this group. Six weeks earlier during a collaborative activity, Green1 dominated the conversation, criticizing a tablemate with his smug replies; Green2 was left flustered; and Green3 never said a word. Now, all three students were willingly participating and doing so politely. Jill shared similar beliefs about conversation stems, revealing,

> I think the conversation starters have been beneficial because I hear the students utilize them consistently. I always remind them to use the sentence stems whenever they start conversations, but I've noticed most of them don't have to look at the poster anymore. It's almost like they've internalized them – like they've become a habit. I frequently hear them say things like, 'I would like to add this because…' or 'I hear what you're saying, but I would like to say…' So, they do use the sentence stems, and I think they help guide discussions in respectful and purposeful ways.

Both field notes and interview data from Jill strongly suggest conversation stems promote productive student-student dialogue during collaborative activities.

Promising Practices for Future Collaboration. Having had very few opportunities to engage in collaborative inquiry and learning, Wendy's students were excited about the *You do it*

together activity during my fourth observation on December 2nd. In fact, the majority were eager to work with their tablemates to complete an exercise that compared photosynthesis to cellular respiration. While giving directions, Wendy instructed the students to use the four main conversation stems during their discourse. She also reminded the talkative students to be intentional in including those who were reserved.

I closely observed the red table during my visit. This group was made up of two students, occupying seats #2 and #3. Both were equally responsible for maintaining a productive dialogue and they were careful to interact in a courteous manner. Likewise, they intentionally utilized conversation stems. I witnessed the following exchange during their discussion of cellular respiration.

Red3: Do plants have to do cellular respiration? Why or why not?

Red2: I don't think so because a plant is a producer. It produces its own energy.

Red3: What do you mean? Can you explain that to me?

Red2: Cellular respiration only happens in animals because they eat food to get energy.

Red3: I respectfully disagree. In the third paragraph, it says 'food has to be converted into energy that cells can use.' I think plants have to convert glucose to energy, too.

Since the students could not come to a consensus, they decided to ask Wendy for clarification. After they described their differing viewpoints, Wendy divulged that Red3 was correct because "photosynthesis and cellular respiration are complementary processes. Photosynthesis is how plants make food, but cellular respiration is how they consume or eat the food." With a celebratory fist bump, Red2 congratulated Red3 for figuring out the correct answer.

To summarize, conversation stems played a pivotal role in getting the conditions right for collaborative inquiry and learning. The four main conversation stems provided a basic structure

that helped students initiate communication and respond appropriately to others. The additional, more in-depth stems offered a framework for students to share opinions, ask questions, and paraphrase specific points of the discussion. Wendy reiterated the purpose of conversation stems, stating,

> They help students learn how to communicate better. A lot of them really lack the social skills needed to work together productively. But these are skills they will need in the real world. I'm hoping that by modeling what is appropriate, it will set them on the right track for the future.

Not only do conversation stems encourage student voice through academic discourse, but they also prepare students to effectively participate in future collaborative endeavors. As such conversation stems are a critical component of productive classroom dialogue. These findings reinforce the sociocultural paradigm which views language as an essential tool in the learning process (Vygotsky, 1978). Furthermore, findings substantiate the research literature which asserts that academic discourse fosters the acquisition of new knowledge and skills that can later be applied for independent use (Scott & Palincsar, 2013; Bonk & Kim, 1998).

Time is of the Essence

The data indicated that time management was critical to the successful integration of the GRR's four phases of learning. According to Jill, "You have to prepare for and manage small chunks of learning - like ten minutes of this, five minutes of that." More specifically, my observational and interview data highlighted the importance of two particular instructional prompts or techniques. The first technique was for teachers to establish appropriate time limits for collaborative tasks. The second technique was to project a timer or countdown clock on the

whiteboard during classroom exercises. This tool appeared useful in helping students better monitor the progress of their group discussions, especially during *You do it together* activities.

Time Can Prompt Participation. Data indicated that the strategic use of time-related prompts can enhance equitable student participation in collaborative activities. Consider my second classroom observation as a case in point. On September 23rd, Jill utilized the Take and Pass strategy as a means of collaborative review. Tablemates were instructed to collaborate to record facts about cells. The first student had 30 seconds to write all he/she knew about cells. Subsequent students were given 30 seconds to add new information to the group's paper. Although this activity did not involve dialogue, it did yield equitable participation as all students contributed to the task for the same, reasonable amount of time.

Time Can Create Chaos and Generate Disengagement. In contrast to Jill's strategic use of time prompts, the data indicated that unstructured time can yield student disengagement in the classroom. My final observation in Wendy's class on December 19th provides an illustration. Her lesson revolved around student engagement in an *Among Us* inspired game created within the learning platform called Gimkit. Wendy scheduled this activity for the *You do it together* phase of instruction as she intended for each table to work as a team to answer the game's teacher-created, multiple-choice questions. She began by instructing Student2 to assume the role of team captain for the first game, with the charge of entering the team's final answer to each question. Once Wendy launched the game, chaos ensued.

Since knowledge, strategy, and **speed** were needed to win, students neglected the desired practices for collaborative inquiry and learning. Rather, they would whisper-yell their answers to the team captain. If teammates did not agree or no one knew the answer, the captain was urged to "just pick one." Sadly, it wasn't long before the most competitive students grew loud and took

control of their groups, destroying any chance of equitable engagement in academic discourse. Wendy, who was preoccupied by a project at her desk, seemed oblivious to the pandemonium and allowed it to continue for almost eight minutes. From my point of view, however, it appeared as though a small group of increasingly-obnoxious students were engrossed in a guessing game while their teammates-turned-spectators either twiddled their thumbs or cheered with abandon.

Per our follow-up coaching conversation, Wendy designed this lesson in hopes of encouraging collaborative inquiry and learning. Unfortunately, her objective was not realized. The activity departed from the desired protocol because it failed to utilize time prompts to ensure equitable participation. Similarly, and perhaps most detrimental, was the fact that time was mismanaged. Wendy failed to realize that this particular Gimkit game prioritized speed over accuracy. As such, the teams that rapidly progressed through the questions without pausing to think about or discuss the correct answers were rewarded more points than the teams that took their time to think and reflect. This game structure discouraged student-student dialogue, thus negating all desired practices for collaborative inquiry and learning. Likewise, it yielded student disengagement as evidenced by those who eventually quit the review game in favor of different digital games or videos.

The findings concerning effective time management are echoed throughout the literature. To begin, time management is crucial to the successful integration of the GRR framework. In fact, Fisher and Frey (2014) highlight the need to intentionally integrate all four phases of instruction in accordance with proposed time allotments for each. While unexpected, the finding regarding strategic use of clocks or countdown timers during collaborative activities is not surprising. In fact, De La Rosa (2019) asserts that “visual timers show students time is of the

essence in the classroom" (para. 4). Timers, therefore, create a sense of urgency, thus motivating students to stay focused and remain on task (Boehm, 2021; Mathews, 2019).

Quality Questions Deepen Discourse

Observational data revealed that student engagement in collaborative inquiry and learning was enhanced when teachers asked questions with varying degrees of rigor. Questions that required recall appeared to generate very little dialogue. On the other hand, complex questions or tasks that demanded critical thinking yielded in-depth discourse.

Jill consistently integrated higher-order questioning into collaborative learning activities. Such was the case during my fifth observation on November 16th when student-student dialogue and teacher-student dialogue revolved around quality questions. I entered Jill's room as she was providing a sneak peek into the day's lesson. She explained that students would soon use a plastic syringe, one balloon, and water to build and assess a syringe model of breathing. Beforehand, the students were instructed to collaborate with group members to discuss and record their answers to two teacher-posed questions. Jill intentionally devised the following questions to stimulate strategic thinking.

1. What part of the model can be compared to the diaphragm, mouth, and chest cavity?
2. Why is water used instead of air?

Likewise, she purposefully structured the collaborative experience. Students were given two minutes to discuss each question. However, each discussion was divided into 30-second intervals, giving each tablemate equal time to talk.

While monitoring group conversations, it became clear that students could activate their conceptual knowledge to accurately compare each of the model's parts to its anatomical counterpart. However, they had difficulty developing a logical argument for the model's use of

water as opposed to air. Aware of the productive struggle, Jill flawlessly transitioned into the *We do it together* phase of learning so she could guide students to the correct conclusion. Jill directed the students to turn their attention to George, the classroom's human body model. With a visual aid, Jill led her students to realize the proximity of the ribs and lungs. She then initiated the following teacher-student discourse.

Jill: Why might their proximity or closeness be problematic?

Yellow4: Your lungs might rub against your ribs when you breathe.

Jill: Exactly! Friction occurs each time you breathe. Thankfully, pleural fluid is present to reduce friction so it doesn't hurt when you breathe. So, why does the model use water?"

Gray2: The water represents pleural fluid. It makes a more accurate model of breathing.

As Jill applauded his answer, I noted how her questions encouraged collaborative inquiry and learning via structured student-student dialogue and focused teacher-student interactions. This finding affirms the literature on quality questioning. Quality questioning is a research-based approach to classroom questioning that promotes higher-order thinking, culminating in the facilitation of academic discourse that takes learning deeper (Walsh & Sattes, 2017). Walsh and Sattes (2015) argue that questioning and discussion are vital instructional components that "work in tandem to move students from passive participants to active meaning makers" (p. 1). Likewise, researchers assert that quality questioning maximizes student engagement, boosts cognition, and fosters student achievement (Hattie, 2009; Hattie, 2012; Walsh & Sattes, 2017).

Outcomes

Jill was the only participant to consistently plan lessons according to the GRR framework and intentionally facilitate opportunities for collaborative inquiry and learning. The *We do it* portion of instruction was primarily devoted to teacher-student dialogue, and the *You do it*

together phase of learning was dominated by student-student dialogue. The successful instructional redesign resulted in an improved culture of teaching and learning characterized by collaboration and discourse. As I highlighted earlier, when teachers successfully implemented assigned tasks and prompts, students became engaged in collaborative activities designed to ensure equitable participation, purposeful conversation, and effective communication. Likewise, they were frequently required to extend their thinking as they presented their ideas, justified their logic, and respectfully addressed counterpoints. Jill described the instructional redesign as follows:

> In the past, [my] lessons involved individual work. Now it's more about what we can do together, and for the large majority of the lesson, I try to have students engaged in small group activities that involve discussion… I focus on placing more responsibility on the students. I plan for more group work so they can do things together.

Just as the culture of teaching and learning improved, so did student outcomes. Collaborative learning structures demanded student participation, yielding an increase in on-task behaviors. Jill explained, “They know that they are expected to be present. They are the ones that are guiding the learning experience. They take charge of the classroom and take more ownership of their learning.” Consequently, Jill’s students developed into independent learners who monitored their progress and took responsibility for their success.

In addition to becoming leaders of their own learning, Jill’s students exhibited academic growth. As Jill remarked, “They're retaining the information as opposed to just memorizing information for a test. Since they have a deeper or more extensive understanding of the content, they’re able to apply the information to different contexts.” Jill required her students to think and

learn at deep cognitive levels, and the instructional rigor resulted in enhanced achievement. During the final interview Jill proudly noted,

> They're obviously learning more, and I think their scores are showing that, too. For example, I gave my students the benchmark as a pretest before we started this nine weeks. And then I gave them the benchmark at the end of the nine weeks, and they increased at least ten points on average in every single class.

Jill attributed her students' improved outcomes to the instructional redesign. As such, she plans to "continue integrating collaboration and dialogue in hopes that the kids continue to show growth."

CHAPTER 5: SUMMARY, IMPLICATIONS, AND CONCLUSION

The research team utilized improvement science to study the practical and empirical warrants of an intervention designed to promote instructional redesign in middle school classrooms. This intervention was based on a complex theory of action. Specifically, we hypothesized if instructional practices were redesigned to facilitate collaboration and dialogue, then participatory learning would increase and students would exhibit increased on-task behaviors.

This study's change efforts were grounded in the professional development and coaching sessions. These sessions were designed to support teachers as they implemented the norms and structures needed to promote collaborative inquiry and learning. Throughout the initial PDSA cycle, observation rubrics were employed to evaluate the extent to which the norms and structures were successfully implemented by teachers. The data suggested that when teachers consistently applied the GRR framework and intentionally integrated structured opportunities for collaboration and discourse, students engaged in collaborative dialogues. In other words, when implemented with fidelity, the intervention appeared to yield desired practices and results.

Summary of Findings

The instructional redesign required teachers to (a) plan lessons according to the GRR's four-step teaching method and (b) intentionally integrate opportunities for collaborative inquiry and learning during the *We do it* and *You do it together* phases of instruction. Likewise, the intervention protocol directed teachers to incorporate collaborative learning structures and

conversation stems into instructional practices. The following summary of findings is presented in accordance with the study's research objectives:

1. To design an intervention that might observe and evaluate teacher efforts to implement new instructional norms in the classroom.
2. To evaluate the extent to which the intervention can be successfully implemented and to identify the conditions that might facilitate or impede successful implementation.
3. To evaluate whether the intervention might generate desired outcomes and to assess the intervention's adaptability and utility for other contexts.

Evaluation of Teacher Implementation Efforts

Throughout the study, the research team observed and evaluated teacher efforts to implement the prescribed instructional norms for collaborative inquiry and learning. Although Jill and Wendy attended the same professional development session and engaged in coaching sessions with the same researcher-coach, their implementation efforts varied greatly.

Jill fully embraced the instructional redesign, intentionally integrating opportunities for collaborative inquiry and learning. Consequently, findings indicate a classroom transformation in which students were frequently engaged in structured group activities and academic discourse. Since Jill prioritized participatory learning, her students consistently exhibited on-task behaviors.

Wendy, on the other hand, was more resistant to change and was hesitant to alter her instructional practices, one observation notwithstanding. Her lessons frequently prioritized independent work, and her students were usually expected to be seated and silent. Despite her established behavioral expectations, observational data consistently exposed multiple off-task behaviors. When she did engage with students, her interactions were limited to either a progress check or redirection of behavior, and most all observed student-student dialogues were of a non-

academic nature (e.g., conversations regarding weekend plans, recent social media posts, origami swans, etc.).

Conditions that Facilitated Successful Implementation

The research team collected and analyzed multiple data sources throughout the duration of the study. Several facilitators for student collaborative inquiry and learning emerged from an analysis of the data. A summary of each facilitator follows. To begin, the data revealed that, in order to successfully facilitate collaborative inquiry and learning, teachers must implement collaborative learning structures (e.g., A/B Partners, Single Round Robin, Continuous Round Robin, Timed Round Robin, and Think-Write-Round Robin). These structures are needed to appropriately and effectively guide student interactions. The data indicated that the use of these structures is necessary to create the conditions needed to promote equitable participation and engagement in classroom learning.

Likewise, the data revealed the importance of having teachers model conversation stems before encouraging students to utilize them. The use of these conversation stems appeared to enhance student engagement by providing individual students with an explicit method for initiating dialogue with their classmates and responding effectively and respectfully to others.

Quality questioning and time management also appeared instrumental in creating the conditions needed for the intervention to achieve its desired aims for student engagement. Specifically, the data indicated that the effective use of quality questioning helped to get the conditions right for student dialogue. Specifically, the incorporation of higher-order questioning appears to be the primary gateway for eliciting deep, academic discourse. Finally, my observational data indicated that time management was critical to the effective execution of the intervention protocol. Time management was important because with it, both teachers and

students were able to track the progress of group tasks and discussions in a manner that facilitated engagement and also allowed the lesson to be completed within the allocated time frame.

Conditions that Impeded Successful Implementation

An analysis of the data also indicated conditions that impeded successful implementation of the proposed intervention. The primary deterrent was the mismanagement of instructional time. In fact, findings revealed that unstructured time yields chaos and student disengagement. This was frequently evidenced in Wendy's classroom, but particularly so when she asked student groups to complete an online game that prioritized speed over accuracy. Not only did the game's format discourage the desired practices for collaborative inquiry and learning, but it generated off-task behaviors as evidenced by students who abandoned the game in favor of individual activities.

Intervention Outcomes: Benefits of Collaborative Inquiry and Learning

In accordance with the final research objective, the research team evaluated whether the intervention generated desired outcomes. Both my observational and interview data provided evidence that our efforts to redesign instruction yielded position outcomes. Put differently, when instruction facilitated collaborative inquiry and learning, the culture of teaching and learning improved. In this improved instructional environment, the teacher became a facilitator of learning who actively monitored student interactions and knowledge acquisition. This shift in teacher roles appeared to position students as active, as opposed to passive, participants in their own learning. Specifically, my observational data and field notes included multiple instances where students exhibited considerable excitement when working together to accomplish a common academic goal. Likewise, they were careful to adhere to behavioral expectations and

execute routines efficiently. In sum, as students' engagement in collaborative dialogues increased, they became leaders of their own learning. This new stance toward classroom engagement appeared to foster academic growth as indicated by the ten-point gain in Jill's pretest-posttest data.

Interpretation of Findings: Strengths and Weaknesses of the Intervention Design

This research was grounded in a collective effort to understand the merits of our intervention across different classrooms and academic subjects/disciplines. The data indicated that the instructional redesign was successful when teachers consistently employed collaborative learning structures; modeled and encouraged the use of conversation stems; effectively managed time; and integrated quality questions that encourage higher-order thinking. While initial findings are promising, there were some flaws in the intervention design that need to be addressed in future work. Specifically, the data revealed needs to augment professional development opportunities and refine coaching strategies.

Implications for Intervention Development: Professional Development

The data indicated shortcomings in the professional development session. Both Jill and Wendy left the training with the misconception that group work can yield collaborative inquiry and learning by itself. As such, they initially integrated group work into the *You do it together* phases of instruction, but failed to implement the new classroom structures and processes needed to promote equitable collaboration and dialogue. This shared misunderstanding highlights the need to provide a more explicit and engaging explanation of the protocol and corresponding prompts in future trainings. Several related implications follow.

Regarding future improvement work, school leaders should provide educators with a series of training modules prior to implementing the intervention framework. These modules

should begin with a thorough explanation of the proposed protocol, detailing the purpose of each intervention and the principles that guide its use (Cooper, 2016; Joyce & Showers, 2002; Knight, 2021). From there, school leaders should allocate the time needed to demonstrate how to implement new instructional strategies and methods before offering teachers an opportunity to transfer their newfound knowledge into practice (Reeves, 2010; Davis, 2015; Joyce & Showers, 2002; Knight, 2021; Garcia & Shaughnessy, 2015). In sum, leaders must adequately explain and model improvement protocols before they can expect teachers to apply the strategies in simulated conditions. Put differently, because the learning is in the doing, teachers need ample opportunities to see "how" it is that these practices can be used before trying to adapt and integrate the practices into their individual classrooms.

Implications for Intervention Development: Coaching

The PDSA cycles and resulting data served to highlight several limitations in coaching strategies that can be further explored and refined in future research. Many of these limitations were the most pronounced in my interactions with Wendy. As noted in the previous chapter, I had a difficult time establishing and maintaining a productive coaching relationship with Wendy. Specifically, although I did my best to engage Wendy in focused coaching conversations, she was frequently distracted during our meetings, quick to alter the subject, and prone to complaining. Her actions, which remained consistent throughout the course of the study, signified a resistance to change that I was not expecting prior to the start of our work together.

Thankfully, the data as well as the literature offers several ideas regarding the coaching tools and strategies that might foster implementation fidelity in future improvement work. To begin, Killion et al. (2014) suggest that the coach and teacher should develop and sign a partnership agreement prior to engaging in collaborative work. In their words,

> Partnership agreements often describe each party's roles and responsibilities, outline desired outcomes for the work, define how the work will be measured, specify what data the coach and teacher will examine and how they will follow up, describe what the coach and the teacher need from one another to be successful, tell how they will interact with one another, and spell out what is confidential. (Killion et al., 2014, p. 1)

By agreeing on a set of clearly defined professional goals and common guidelines, both the coach and the teacher may be more likely to maintain a consistent focus on the mission and purpose of the partnership.

Similarly, Knight (2022) advises coaches to cultivate a partnership approach to collaboration. This approach is rooted in a theory of interaction based on the principles of equality, choice, voice, reflection, dialogue, praxis, and reciprocity. In particular, Knight (2022) argues that reflection lies at the heart of professional growth. He equates a reflective conversation to a meeting of the minds in which the coach and teacher collaborate to formulate ideas for continued improvement. The idea here is that dialogue is only possible when the coach forgoes one-way lectures in favor of two-way conversations. But in order for such dialogue to be productive, both the coach and teacher must enter discussions with humility and honesty. When a coach operates according to the principle of praxis, learning is grounded in reality and driven by action (i.e., the application of new ideas).

Finally, when coaching is built on the principle of reciprocity, the coach and teacher learn together. Reciprocity requires an open mind and the belief that each coaching interaction is an opportunity to learn from one another's ideas, strategies, and passions. Thus, Knight's partnership principles provide a recipe for the preservation of productive coaching relationships.

Namely, the coach and teacher must share power as they engage in shared work focused on the advancement of teaching and learning.

Strategies for Addressing Teacher Ambivalence and Resistance. In addition to the specific strategies highlighted above, coaches need to be prepared to manage teacher resistance to instructional change. Dowd (2020) and Gallo (2014) argue that resistance to coaching presents itself in different ways. Some teachers are directly defiant, often believing that change is unnecessary. Others are more passive in their resistance, simply treating coaching as a recommendation.

In this study, Wendy appeared to resist coaching because she was overwhelmed by the amount of time and energy required to implement new instructional strategies. In order to combat this kind of resistance, Dowd (2020) encourages coaches to build a trusting relationship based on transparency, empathy, and appreciation. When met with resistance, coaches should reiterate the purpose of coaching, making sure to explain that coaching is not just "one more thing" that needs to be accomplished. Rather, it is meant to be a collaborative effort toward continuous improvement in teaching and learning. Finally, coaches must recognize and consistently celebrate each teacher's strengths, all while bringing "clarity, courage, and accountability to the coaching conversations" (Inam, 2017, para. 15).

Framework for Future Action. I approached my work with Wendy with the goal of fostering reflective dialogue, while also providing encouragement, ideas, resources, and demonstrations for what I hoped she could accomplish with our intervention. However, because I was acutely aware of Wendy's professional and personal challenges, I often found myself transitioning from the role of coach to confidant, assuming I could respond to her social-emotional needs and then redirect the conversation to instructional matters. Unfortunately, I

usually failed to do so, thereby allowing personal factors to prevent a productive coaching relationship.

As a result, Wendy neglected to redesign her instructional practices to foster collaboration and dialogue. It would be easy to attribute Wendy's standstill to an array of professional and personal difficulties and/or her ambivalence to change efforts. However, Dodd's work suggests I should have approached the coaching relationship differently. Three coaching adaptations seem especially salient for others wishing to pursue similar work.

To begin, coaches should develop formal partnership agreements. In this study, this approach should have included eliciting Wendy's input regarding the intervention, desired student outcomes, and how each might help her realize her personal goals. Second, coaches should provide teachers like Wendy with the opportunity to identify and express their needs in relation to the instructional redesign. By doing this, coaches are better positioned to align coaching to teacher-identified needs, providing a more focused and intentional approach to each coaching session in the process. Theoretically, this partnership approach to coaching may help create the conditions whereby teachers can find more value in coaching and, in turn, be more apt to integrate the norms and structures for collaborative inquiry and learning. Finally, by giving teachers like Wendy voice and choice about model development and strategies for implementation, teachers can be repositioned from "students" of the coach to instructional leaders who can engage in the co-design of new and improved learning environments.

Implications for Organizational Change at FMS

This improvement science project documented organizational change efforts aimed at the implementation of instructional interventions designed to promote participatory learning. Initial findings are promising as the instructional redesign resulted in an improved culture of teaching

and learning characterized by collaboration and academic discourse. When implemented with fidelity, the intervention resulted in improved student outcomes as well. Specifically, students exhibited independent learning, increased participation, increased on-task behaviors, and increased achievement.

These findings are critical because they indicate that ***the conditions that foster powerful learning, development, and improvement are similar for both students and teachers***. This significant empirical and theoretical finding is supported by sociocultural theory. Sociocultural theory is based on the proposition that knowledge is socially constructed and mediated by dialogue (Vygotsky, 1978). Thus, my findings support social-cultural approaches to instructional redesign, especially those grounded in the belief that pedagogical strategies that emphasize peer collaboration, dialogue, and joint knowledge construction are the most likely to yield improvements in student engagement and achievement (Bonk & Kim, 1998; Mercer & Littleton, 2007; Littleton & Howe, 2010).

The overall goal of improvement science is to "develop the necessary *know-how* for a reform idea to spread faster and more effectively" (Carnegie Foundation, 2022, para. 3). As such, the research team sought to discover the conditions required for continuous improvement within the organization. Findings revealed that students flourished in a structured, collaborative learning environment. Similarly, several of the participating teachers flourished in a structured, collaborative learning environment. Consequently, leaders must consistently engage educators in shared activities that integrate reflection and dialogue. Such professional collaboration can be achieved via the establishment of coaching partnerships between teachers and trained coaches. Unfortunately, the organization is not adequately structured to provide regularly scheduled coaching to the core content teachers.

Implications for School Organization and Leadership

In order to effectively scale this effort in other classrooms and schools, new system-level practices are required. Significantly, the development of these practices may require a new set of resources and supports. Several recommendations for systems redesign and resource development follow.

First, it is suggested that policymakers and educational leaders reallocate funding to provide one permanent coaching position per school. This position must be dedicated solely to the spread of collaborative inquiry and learning via one-to-one coaching with teachers. It is expected that this intervention will require sizable investments in terms of funding and staff. However, research justifies additional expenses as coaching has large positive effects on instructional practices which affect student learning. For example, Kraft and Blazar's (2018) meta-analysis of the literature found that coaching improves the quality of teachers' instruction by nearly .5 of a standard deviation.

In addition, scaling our intervention may require new systems for selecting and training coaches. For this reason, it is recommended that administrators seek to hire coaches with teaching/coaching experience, pedagogical knowledge, and rapport-building skills. While coaches can participate in "systemic, high-quality professional learning led by regional specialists" (Alabama State Department of Education, 2020, p. 8), more in-depth, targeted training is preferred. Specifically, it is suggested that newly-hired coaches be trained in cognitive coaching, perhaps as modeled by the Alabama Best Practices Center. This kind of training is focused on the promotion of coaching strategies and communication skills needed to help teachers plan for and reflect on the implementation of desired instructional practices.

A third implication for scaling relates to the number of classrooms that educational leaders should target for scaling after initial pilot testing. Here, Aguilar (2014) argues that coaches should work with no more than 12 teachers at a time. Similarly, Kraft and Blazar (2022) assert that coaching is intended to be individualized, context-specific, and time-intensive, usually lasting at least one semester. Taking these considerations into account, the effective spread of this intervention could be a lengthy process on a large campus. With respect to FMS, however, it would be possible to scale the intervention across all 24 core classes within a year's time **if** the coach focuses on 12 teachers each semester. The administration and coach must be intentional in the selection of the 12 participating teachers because the coach's schedule has to accommodate all required observations and coaching conversations, the latter of which must occur during the teacher's planning period.

If the system is tailored to the aforementioned recommendations, then each core teacher will receive intensive, individualized coaching via a semester-long partnership with a trained coach. Consequently, all academic courses will be redesigned to integrate instructional practices that promote participatory learning through collaboration and dialogue. Such instructional enhancements will ensure sustained, improved student outcomes.

Implications for Future Research

This improvement science study included several design limitations. These limitations double as needs for future research. Specifically, future research efforts should further test the scalability of this intervention using more teachers/classrooms as well as more schools. In a similar vein, more research is needed on the coaching and leadership practices that can help alleviate teacher resistance as teacher noncompliance with the intervention protocol was a primary limiting factor for intervention effectiveness across all three members of the research

team. In addition, the collective improvement work of the research team suggested that the quality and use of collaborative dialogues may vary according to students' academic preparation and standing. For this reason, more research is needed on how teachers and students adapt collaborative learning efforts in different "kinds" of classrooms (e.g., regular classes, honors classes, inclusion classes).

A final implication for research concerns the use of improvement science to study instructional innovations like the one piloted and studied in this research. As noted earlier, improvement science methods were utilized in this study because they provide school leaders and practitioners with the opportunity to engage in the codesign of innovations that are tailored to fit the strengths, challenges, and needs of particular schools and school community contexts. Although this particular improvement project remains in its developmental stages, improvement science proved useful in helping the research team develop and modify a detailed set of professional learning and instructional protocols, that when implemented properly, can serve as vital catalysts for instructional change. Through collaboration with classroom teachers, improvement science allowed the research team to identify the conditions that helped facilitate student collaborative inquiry and learning: integration of collaborative learning structures; consistent use of conversation stems; effective time management; and quality questioning that inspires higher-order thinking. Initial findings suggest an improved culture of teaching and learning that has resulted in increased student engagement and achievement. With such positive evidence, it is recommended that educational researchers, leaders, and policy makers continue to use improvement science as a tool for facilitating more enduring, bottom-up reform practices and strategies.

Conclusion

Improvement science has emerged as a popular approach to educational change because it provides schools with a framework for effectively addressing school-specific problems and challenges while also helping to foster an organizational culture of continuous learning and improvement. By pairing disciplinary knowledge with profound knowledge of the local system (Carnegie Foundation, 2022), the research team was able to formulate the study's theory of improvement which is depicted by a driver diagram. The theory of improvement called for the researchers to engage participants in professional learning and subsequent coaching sessions designed to encourage and support teachers as they redesigned instruction to facilitate collaborative inquiry and learning. When teachers consistently integrated the prescribed norms and structures for collaborative inquiry and learning, students exhibited the corresponding collaborative practices. Moreover, the targeted primary drivers of *Collaborative Teacher-Student Dialogue* and *Collaborative Student-Student Dialogu*e were realized, resulting in participatory learning and increased on-task behaviors. These preliminary findings suggest that the driver diagram serves as a successful recipe for instructional improvement.

However, findings from this study also highlighted unanticipated flaws and limitations in the design and delivery of our change ideas. As such, this dissertation helped the research team identify needs to modify our professional development and coaching protocols in order to improve intervention effectiveness and scalability. Likewise, continued research, training, and coaching appear needed within and across classrooms in order to scale and sustain the progress made through our initial piloting of the effort. This study was designed to provide a more detailed roadmap for future research and action in support of collaborative inquiry and learning.

If this study helps teachers and schools accelerate their efforts to improve teaching, learning, and student engagement, it will have achieved its primary aim.

REFERENCES

Aguilar, E. (2013). *The art of coaching: Effective strategies for school transformation*. Jossey-Bass.

Aguilar, E. (2014, October 23). 12: The maximum number of teachers that a coach should coach. *EducationWeek.* https://www.edweek.org/education/opinion-12-the-maximum-number-of-teachers-that-a-coach-should-coach/2014/10

Alabama State Department of Education. (2020). *The Alabama coaching framework.* RMC Research Corporation.

Allman, B. (2018). Socioculturalism. In R. Kimmons & S. Caskurlu (Eds.), *The students guide to learning design and research.* EdTech Books. https://edtechbooks.org/studentguide

Annenberg Institute for School Reform. (2004). *Instructional coaching: Professional development strategies that improve instruction.* https://annenberg.brown.edu/sites/default/files/InstructionalCoaching.pdf

Bair, M. A. (2017). Faculty development through cognitive coaching. *Journal of Faculty Development, 31*(3), 79–85.

Baker, R., & Showers, B. (1984). *The effects of a coaching strategy on teachers' transfer of training to classroom practice: A six-month follow-up study* [Paper presentation]. Annual Meeting of the American Educational Research Association, New Orleans, LA, United States.

Barnes, D., & Todd, F. (1995). *Communication and learning revisited.* Heinemann.

Bell, T., Urhahne, D., Schanze, S., & Ploetzner, R. (2010). Collaborative inquiry learning: Models, tools, and challenges. International Journal of Science Education, 32(3), 349-377. https://doi.org/10.1080/09500690802582241

Boehm, C. (2021, February 1). Why timers are good for your classroom. *Organize and Educate.* https://www.organizeandeducate.com/post/why-timers-are-good-for-your-classroom

Bonk, C. J., & Kim, K. A. (1998). Extending sociocultural theory to adult learning. In M. C. Smith & T. Pourchot (Eds.), *Adult learning and development: Perspectives from educational psychology* (pp. 41-58). Routledge.

Brion, C. (2020). Learning transfer: The missing linkage to effective professional development. *Journal of Cases in Educational Leadership, 23*(3), 32-47.

Broad, M. L. (1997). Transfer concepts and research overview. In J. J. Phillips, & M. L. Broad (Eds.), *Transferring learning to the workplace* (pp. 1-18). American Society for Training and Development.

Brophy, J. E. (2000). *Teaching: Educational practices series 1.* International Bureau of Education.

Bryk, A. S. (2015). Accelerating how we learn to improve. *Educational Researcher, 44*(9), 467-477.

Bryk, A. S., Gomez, L. M., Grunow, A., & LeMahieu, P. G. (2017). *Learning to improve: How America's schools can get better at getting better.* Harvard Education Press.

Carnegie Foundation for the Advancement of Teaching. (2022). *Our ideas*. https://www.carnegiefoundation.org/our-ideas/

Chang, J., & Song, J. (2016). A case study on the formation and sharing process of science classroom norms. International Journal of Science Education, 38(5), 747-766. https://doi.org/10.1080/09500693.2016.1163435

Chiu, T. K. F., Chai, C. S., Williams, P. J., & Lin, T. J. (2021). Teacher professional development on self-determination theory-based design thinking in STEM education. *Educational Technology & Society, 24*(4), 153-165.

Cohen-Vogel, L., Tichnor-Wagner, A., Allen, D., Harrison, C., Kainz, K., Socol, A. R., & Wang, Q. (2014). Implementing educational innovations at scale: Transforming researchers into continuous improvement scientists. *Educational Policy, 29*(1), 257-277.

Colucci, A. (2014). The power of peer coaching. *Educational Horizons, 92*(3), 6-8.

Cooper, J. D. (2016). Professional development: An effective research-based model [PowerPoint slides]. Houghton Mifflin Harcourt. https://dataworks-ed.com/wp-content/uploads/2016/05/JoyceShowers.pdf

Cordingley, P. (2005). The role of mentoring and coaching in teachers' learning and development. *Education Review, 18*(2), 68-74.

Cornett, J., & Knight, J. (2009). Research on coaching. In J. Knight (Ed.), *Coaching: Approaches and perspectives* (pp. 192-216). Corwin.

Costa, A. L., & Garmston, R. J. (2002). *Cognitive coaching: A foundation for renaissance schools* (2nd ed.). Christopher-Gordon.

Crow, R., Hinnant-Crawford, B. N., Spaulding, D. T. (Eds.). (2019). *The educational leader's guide to improvement science: Data, design and cases for reflection.* Myers Education Press.

Davis, V. (2015, April 15). 8 top tips for highly effective PD. *Edutopia.* https://www.edutopia.org/blog/top-tips-highly-effective-pd-vicki-davis

Dean, C. B., Hubbell, E. R., Pitler, H., & Stone, B. J. (2012). *Classroom instruction that works: Research-based strategies for increasing student achievement* (2nd ed.). ASCD.

De La Rosa, S. (2019, August 12). Timed lessons could be a highly effective teaching technique. *K-12Dive.* https://www.k12dive.com/news/timed-lessons-could-be-a-highly-effective-teaching-technique/560681/

Deming, W. E. (2018). *The new economics for industry, government, education* (3rd ed.). MIT Press.

Devine, M., Meyers, R., & Houssemand, C. (2013). How can coaching make a positive impact within educational settings? *Procedia - Social and Behavioral Sciences*, *93*, 1382-1389.

Dolle, J. R., Gomez, L. M., Russell, J. L., & Bryk, A. S. (2013). More than a network: Building professional communities for educational improvement. *Yearbook of the National Society for the Study of Education, 112*(2), 443-463.

Dowd, H. (2020, January 8). How to connect with resistant teachers (3 actionable tips). *EdTechTeam*. https://www.edtechteam.com/blog/2020/01/how-to-connect-with-resistant-teachers-3-actionable-tips/

Elliot, K., Frey, N., & Fisher, D. (2019). Leading learning through a gradual release of responsibility instructional framework. In M. B. McVee, E. Ortlieb, J. S. Reichenberg, & P. D. Pearson (Eds.), *The Gradual Release of Responsibility in Literacy Research and Practice* (pp.1-21). Emerald Publishing.

Evertson, C., & Poole, I. (2003). *Establishing classroom norms & expectations.* IRIS Center. https://iris.peabody.vanderbilt.edu/wp-content/uploads/pdf_case_studies/ics_norms.pdf

Fisher, D., & Frey, N. (2014). *Better learning through structured teaching* (2nd ed.). ASCD.

Florence City Schools. (2021, June 21). *2021-2022 Back to school guidance plan.* https://www.florencek12.org/cms/lib/AL50000158/Centricity/Domain/3009/2021%202022%20FCS%20Back%20to%20School%20Plan%20WEB%202.pdf

Gallo, A. (2014, September 19). Coaching an employee who doesn't want help. *Harvard Review.* https://hbr.org/2014/09/coaching-an-employee-who-doesnt-want-help

Garcia, N., & Shaughnessy, M. (2015, Oct. 29). High-leverage teaching practices: What, why and how? [PowerPoint slides]. TeachingWorks. https://www.teachingworks.org/images/files/OCTEO_2015_FINAL_HighLeverageTeachingPracticesUM.pdf

Garrison, D. R., & Akyol, Z. (2013). The community of inquiry theoretical framework. In. M. G. Moore (Ed.), *Handbook of Distance Education*, (3rd ed., pp. 104-120). Routledge.

Good, T. L., & Brophy, J. E. (2000). *Looking in classrooms* (8th ed.). Longman.

Grant, M., Lapp, D., Fisher, D., Johnson, K., & Frey, N. (2012). Purposeful instruction: Mixing up the "I," "we," and "you." *Journal of Adolescent and Adult Literacy, 56*(1), 45-55. http://dx.doi.org/10.1002/JAAL.00101

Graves, M. F., & Fitzgerald, J. (2003). Scaffolding reading experiences for multilingual classrooms. In G. G. Garcia (Ed.), *English learners: Reaching the highest level of English literacy* (pp. 96-124). International Reading Association.

Hattie, J. (2009). *Visible learning: A synthesis of over 800 meta-analyses relating to achievement.* Routledge.

Hattie, J. (2012). *Visible learning for teachers: Maximizing impact on learning.* Routledge.

Heineke, S. F. (2013, March). Coaching discourse: Supporting teachers' professional learning. *The Elementary School Journal, 113*(3), 409-433.

Herr, K., & Anderson, G. L. (2015). *The action research dissertation: A guide for students and faculty* (2nd ed.). SAGE.

Hinnant-Crawford, B. N. (2020). *Improvement science in education: A primer.* Myers Education Press.

Hlas, A. C. (2021). High-leverage teaching practices: Designing tasks for interaction. In P. M. Wesely (Ed.). *One vision – Multiple perspectives* (pp. 31-46). Robert M. Terry.

Hora, M. T., & Anderson, C. (2012). Perceived norms for interactive teaching and their relationship to instructional decision-making: A mixed methods study. *Higher Education, 64*(4), 573-592.

Inam, H. (2017, February 19). Ten ways great coaches overcome resistance to change. *Forbes.* https://www.forbes.com/sites/hennainam/2017/02/19/ten-ways-great-coaches-overcome-resistance-to-change/

Institute of Education Sciences. (2017, December). *Introduction to improvement science.* REL West. https://ies.ed.gov/ncee/edlabs/regions/west/Blogs/Details/2#improvement_science

Johnson, J. B. (2006, May). *Instructional skills workshop handbook for participants.* https://www.algonquincollege.com/profres/files/2013/11/Instructional-Skills-Workshop-ISW-Handbook-for-Participants1.pdf

Joyce, B., & Showers, B. (2002). *Student achievement through staff development* (3rd ed.). ASCD.

Kennedy, A. (2014). Understanding continuing professional development: The need for theory to impact on policy and practice. *Professional Development in Education, 40*(5), 688-697. https://doi.org/10.1080/19415257.2014.955122

Killion, J. (2008). Are you coaching heavy or light? *Teachers Teaching Teachers, 3*(8), p. 1-4.

Killion, J., Harrison, C., Bryan, C., & Clifton, H. (2014). Teacher-coach relationships. *Tools for Learning Schools, 17*(4), 1-7.

Knight, J. (2007). *Instructional coaching: A partnership approach to improving instruction*. Corwin.

Knight, J. (2011). *Unmistakable impact: A partnership approach for dramatically improving instruction*. Corwin.

Knight, J. (2018). *The impact cycle: What instructional coaches should do to foster powerful improvements in teaching.* Corwin Press.

Knight, J. (2021). Moving from talk to action in professional learning. *Educational Leadership, 78*(5), 16-21.

Knight, J. (2022). *The definitive guide to instructional coaching: Seven factors for success.* ASCD.

Kraft, M. A., & Blazar, D. (2018). Taking teacher coaching to scale: Can personalized training become standard practice? *Education Next*, *18*(4), 68-74.

Kroeger, S. D., Doyle, K., Carnahan, C., & Benson, A. G. (2022). Microteaching: An opportunity for meaningful professional development. *Teaching Exceptional Children.* https://doi.org/10.1177/00400599211068372

Lewis, C. (2015). What is improvement science? Do we need it in education? *Educational Researcher, 44*(1), 54-61. https://doi.org/10.3102/0013189X15570388

Littleton, K., & Howe, C. (Eds.). (2010). *Educational dialogues: Understanding and promoting productive interaction.* Routledge.

Makar, K., & Fielding-Wells, J. (2017). Shifting more than the goals posts: developing classroom norms of inquiry-based learning in mathematics. Mathematics Education Research Journal, 30, 53-63.

Marzano, R. J., Waters, T., & McNulty, B. A. (2005). *School leadership the works: From research to results*. ASCD.

Mathews, J. (2019, August 9). Time is on their side: Teachers are using countdown clocks as a classroom tool. *The Washington Post.* https://www.washingtonpost.com/local/education/time-is-on-their-side-teachers-are-using-countdown-clocks-as-a-classroom-tool/2019/08/08/bcecf402-b956-11e9-a091-6a96e67d9cce_story.html

Mercer, N., & Howe, C. (2012). Explaining the dialogic processes of teaching and learning: The value and potential of sociocultural theory. *Learning, Culture and Social Interaction, 1*(1), 12-21. https://doi:10.1016/j.lcsi.2012.03.001

Mercer, N., & Littleton, K. (2007). *Dialogue and the development of children's thinking.* Routledge.

Merriam, S. B., & Tisdell, E. J. (2016). *Qualitative research: A guide to design and implementation* (4th ed.). Jossey-Bass.

Mintrop, R. (2016). *Design-based school improvement: A practical guide for educational leaders.* Harvard Education Press.

Mizell, H. (2010). *Why professional development matters.* Learning Forward. https://learningforward.org/wp-content/uploads/2017/08/professional-development-matters.pdf

Paterson, J. (2021, October 26). *Substitute teacher shortage causes more school disruptions*. National Education Association. https://www.nea.org/advocating-for-change/new-from-nea/substitute-teacher-shortage-causes-more-school-disruptions

Patti, A. L., Rafferty, L. A., Budin, S., & Maheady, L. (2021). The role of high leverage practices in effective inclusive elementary schools. In J. McLeskey, F. Spooner, B. Algozzine, & N. L. Waldron (Eds.), *Handbook of effective inclusive elementary schools*: *Research and practice* (2nd ed., pp. 181-198). Routledge.

Pearson, P.D., & Gallagher, M. C. (1983). The instruction of reading comprehension. *Contemporary Educational Psychology, 8*(3), 317-344.

Pearson, P. D., McVee, M. B., & Shanahan, L. E. (2019). In the beginning: The historical and conceptual genesis of the gradual release of responsibility. In M. B. McVee, E. Ortlieb, J. S. Reichenberg, & P. D. Pearson (Eds.), *The Gradual Release of Responsibility in Literacy Research and Practice* (pp.1-21). Emerald Publishing.

Perry, J. A., Zambo, D., & Crow, R. (2020). The improvement science dissertation in practice: A guide for faculty, committee members, and their students. Myers Education Press.

PLS 3rd Learning. (2014). *Collaborative inquiry for students: Preparing minds for the future.* https://plsclasses.com/wp-content/uploads/2013/01/plsclasses_collaborative_inquiry_for_students_preparing_minds_for_the_future_syllabus_jan_141.pdf

Reeves, D. B. (2010). *Transforming professional development into student results.* ASCD.

Rohanna, K. (2017, March). Breaking the "adopt, attack, abandon" cycle: A case for improvement science in K-12 education. *New Directions for Evaluation, 2017*(53), 65-77.

Scott, S., & Palincsar, A. (2013). *Sociocultural theory.* The Gale Group. http://dr-hatfield.com/theorists/resources/sociocultural_theory.pdf

Segner, B. (2020, Dec. 21). What instructional coaching is and is not. *ConvertKit*. https://bethsegner.com/what-instructional-coaching-is-and-is-not/

Sharratt, L., & Fullan, M. (2009). *Realization: The change imperative for deepening district-wide reform.* Corwin Press.

Showers, B. (1982). *Transfer of training: The contribution of coaching*. Center for Educational Policy and Management.

Showers, B. (1984). *Peer coaching: A strategy for facilitating transfer of training.* Center for Educational Policy and Management.

Speck, M., & Knipe, C. (2005). *Why can't we get it right? Designing high-quality professional development for standard-based schools.* Corwin Press.

Sun, J.-P., & Leithwood, K. (2016). Leadership for improving student learning: A school improvement framework. In M. Burke & B. Mendiola (Eds.), *Instructional leadership handbook* (pp. 282-304). Alabama Superintendent Academy & University of Alabama.

Sword, R. (2021, March 12). *Instructional coaching: Benefits & strategies*. High Speed Training. https://www.highspeedtraining.co.uk/hub/what-is-instructional-coaching/

Van Nieuwerburgh, C. (Ed.). (2018). *Coaching in education: Getting better results for students, educators, and parents*. Routledge.

Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes.* Harvard University Press.

Walsh, J. A., & Sattes, B. D. (2015). *Questioning for classroom discussion: Purposeful speaking, engaged listening, deep thinking.* ASCD.

Walsh, J. A., & Sattes, B. D. (2017). *Quality questioning: Research-based practice to engage every learner* (2nd ed.). Corwin.

Wang, L., Bruce, C., & Hughes, H. (2011). Sociocultural theories and their application in information literacy research and education. *Australian Academic & Research Libraries, 42*(4), 296-308. https://doi:10.1080./00048623.2011.10722242

Wiggins, G. (1998). *Educative assessment: Designing assessment to inform and improve student performance.* Jossey-Bass.

APPENDIX I: OBSERVATION RUBRIC #1

Evident (+) Not Evident (-)	**Norms and Structures for Collaborative Inquiry and Learning**
	An anchor chart with the four main conversation stems is posted in the room.
	Collaborative placements are visible at all student groups.
	Each student has access to a flip chart that provides the four main conversation stems, additional conversation stems, and the student practices for inquiry and learning.
	The teacher and students use conversation stems during the *We do it* phase of instruction.
	Students utilize conversation stems during the collaborative activities that comprise the *You do it together* phase of instruction.
	The teacher controls group conversation structures.

APPENDIX II: OBSERVATION RUBRIC #2

Evident (+) Not Evident (-)	**Desired Student Practices**	**Description of Practices for Collaborative Inquiry and Learning**
	Commit to collaborative thinking and speaking	Contribute your ideas to group dialogue. Connect to the thinking of others when possible.
	Listen actively	Listen with an open mind and without thinking of what you'll say next. Set aside judgement to listen to others and to yourself more deeply. If you feel judgmental or defensive, ask yourself… • "I wonder what brought her to this belief?" • "I wonder what he's feeling right now?" • "I wonder what my reaction teaches me about myself?"
	Be open to and respect all points of view	Listen to understand perspectives that differ from your own. Better understand each person's thinking by asking, "What makes you say that?"
	Check for understanding	Before countering or adding to another's comment, be sure you fully understand what has been said by paraphrasing and posing questions for clarification.
	Accept responsibility for active and equitable participation	Encourage those who are not speaking to offer their perspectives. Monitor your own speaking – voicing, but not dominating.

APPENDIX III: COACHING QUESTIONS

1. What went well for you?
2. What was challenging for you?
3. What was most useful for you?
4. What is on your mind related to the lesson and/or student collaborative inquiry and learning?
5. What are your concerns?
6. What do you need or want?
7. How can I help you?
8. Tell me more.

APPENDIX IV: INTERVIEW QUESTIONS

1. How has the implementation of the *We do it* and *You do it together* stages of the Gradual Release of Responsibility (GRR) changed or altered your role as a teacher?
2. What are the expectations and/or limitations associated with a being a facilitator of learning?
3. How and in what ways has this shift changed your daily work?
4. How does your role as a facilitator of learning help students take ownership of their learning? What effect does your role as facilitator have on student learning?
5. Which new strategies enhanced your instruction so that students improved their learning process?
6. How did the norms and structures for collaborative inquiry and learning contribute to building collaborative relationships among the students?
7. How did the norms and structures support the development of student practices for collaborative inquiry and learning?
8. What types of knowledge and preparation does a teacher need to be successful as a facilitator of student learning? What makes you say that?
9. How much time must a teacher devote to planning instruction that features purposeful collaboration and dialogue? Is it about the same as planning for any other lesson?
10. If you could share anything with me regarding your participation in this study, what would it be? Why? What are your concerns? What excites you? Tell me more.

APPENDIX V: IRB APPROVAL LETTER

THE UNIVERSITY OF ALABAMA | Office of the Vice President for Research & Economic Development
Office for Research Compliance

June 17, 2021

Jacquelyn Flowers
Department of ELPTS
College of Education
The University of Alabama
Box 870231

Re: IRB # 21-04-4500 "Multi-Stage Research Focused on Instructional Re-design and Organizational Re-culturing"

Dear Ms. Flowers:

The University of Alabama Institutional Review Board has granted approval for your proposed research. Your protocol has been given exempt approval according to 45 CFR part 46.104(d)(1) as outlined below:

(1) Research conducted in established or commonly accepted educational settings that specifically involves normal educational practices that are not likely to adversely impact students' opportunity to learn required educational content or the assessment of educators who provide instruction. This includes most research on regular and special education instructional strategies and research on the effectiveness or the comparison among instructional techniques, curricula, or classroom management methods.

The approval for your application will lapse on June 16, 2022. If your research will continue beyond this date, please submit the annual report to the IRB as required by University policy before the lapse. Please note, any modifications made in research design, methodology, or procedures must be submitted to and approved by the IRB before implementation. Please submit a final report form when the study is complete.

Please use reproductions of the IRB approved informed consent form to obtain consent from your participants.

Good luck with your research.

Sincerely,

Carpantato T. Myles, MSM, CIM, CIP
Director & Research Compliance Officer

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