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The aim of this mixed methods study was to examine how restorative practices might be explored by teachers in the context of self-designed and embedded integrated STEM and literacy professional learning to promote utilization of these practices as tools for orchestrating and nurturing strong and equitable learning communities within their classrooms. Through exploration of integrated STEM and literacy curriculum design, teachers built on their understanding of culturally relevant, culturally responsive, and restorative practices.

This work was a complex application of a convergent mixed methods research design utilizing a participatory-social justice approach. The quantitative data explored: In what ways do teachers understand Social Justice in Education and restorative practices? The qualitative data investigated: In what ways does fostering a STEM focused teacher community of practice center equity? At the point of integration this study pursued the questions: In what ways does participation in a teacher community of practice focused on science and literacy integration serve as a mechanism to disrupt the wider racialized school system? In what ways do teachers' implementation of restorative practices contribute to or trouble the reproduction of inequity?

The findings of this study suggest teachers understood that Social Justice in Education addresses a racialized educational system through the facilitation of learning communities which nurture the well-being of all their students. Although the use of the word *restorative* was associated with reactive enactments, restorative practices were used by teachers in equal measure to repair harm and build community. This research found that a teacher community of practice focused on STEM and literacy integration can become a space/place for candid discussions centering equity and has the potential to be a proactive enactment of restorative practices.

STEM AND LITERACY INTEGRATION AS A LOCUS FOR RESTORATIVE PRACTICES PROFESSIONAL LEARNING: A MIXED METHODS STUDY

by

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CHAPTER I: INTRODUCTION

Introduction

Restorative justice in education (RJE) and restorative practices (RP) were born out of the Social Justice movement focused on the legal system (Evans and Vaandering, 2016). Often conflated (Weber & Vereenooghe, 2020), this study made a distinction between them. For the purposes of this research, I adopted Evans and Vaandering (2016) definition of RJE: *Facilitating learning communities that nurture the capacity of people to engage with one another and their environment in a manner that supports and respects the inherent dignity and worth of all* (p. 8).

The leading education institution in RP in the United States, the International Institute for Restorative Practice (IIRP), views restorative justice under the umbrella of RP, used responsively, it focuses on repairing harm (Wachtel, 2016). However, this work took a different perspective. Restorative justice in education is the mission. Restorative practices as activity or action herald a trajectory towards RJE. In this study I operationalize RP as *the proactive enactments of the community towards developing a sense of well-being for all the involved individuals through learning as belonging and doing*. The aim of this study was to examine the possibility of teacher communities of practice as a site for exploring restorative practices and Social Justice in Education. In this research I use Rodriguez's (2016) definitions of diversity, equity, and Social Justice. Rodriguez operationalizes diversity as "*the recognition of the visible and invisible physical and social characteristics that make an individual or group of individuals different from one another, and by doing so, celebrating the difference as a source of strength for the community at large*" (Rodriguez & Morrison, 2019, p. 242). Equity is understood to be t*he enactment of educational "practices that ensure equitable access and opportunities for success*

for everyone" (Rodriguez & Morrison, 2019, p. 243). Therefore, Social Justice in this research is viewed *as the enactment of educational "practices to promote diversity and equity"* (Rodriguez & Morrison, 2019, p19.243).

The process and product of this research, a shared experience through a teacher community of practice thinking about, discussing, and designing restorative learning spaces for students, was situated in science and literacy integration as a means of building a robust learning community. This professional learning examined how matters of (in)equity can be surfaced through the development of a community of practice focused on the integration of STEM and literacy.

This research explored how a teacher community of practice at Beechwood Elementary School (BWES) centered on the integration of STEM and literacy addressed matters of (in)equity pervasive in the U.S. school system. This work viewed educational equity as a space/place of learning in which all children are supported so they may thrive, and opportunities exist for them to reach their fullest potential academically and social-emotionally (Aguilar, 2020) by attending to cultural relevance, cultural responsiveness and resources throughout the educational institution. Nieto (2013) described four components of SJE as 1) troubling inequitable narratives, 2) furnishing both emotional and material resources, 3) leveraging student aptitudes, 4) and designing learning communities that develop students' capacity for social change. The complexities of the SJE were examined through Critical Race Theory (CRT) and Social Practice Theory (SPT) in service of each other. This work was conceived of and understood through three facets of social practice: 1) institutional struggle; 2) practice as meaning, community, learning, boundary, and locality; 3) constellations of community. The CRT tenets used to view these social practice conceptualizations were racism is normal, race is a

social construct, intersectionality and essentialism, and voice and counter narrative. The idea of institutional struggle of the racialized nature of the U.S. educational system was examined through the assumption that racism in this institution is normal and race is a social construct. Voice and counter narrative presented a more nuanced way to surface through a community of practice, education's institutional struggle with racism at BWES. The complexity of constellations of community was more clearly understood through the CRT notions of intersectionality and essentialism. The use of these guiding tenets from CRT assisted in centering equity and designing professional learning experiences as part of the community of practice with an eye towards transformation.

Restorative practices pave the way for the possibility of transformation. There is "methodological and philosophical concordance" between RP implementation and evaluation efforts and transformative mixed methods (Garnett et al., 2019, p.313). Social design methods were important to this work as this study was an effort to work collectively as faculty, staff, and leadership to create and steward restorative spaces for both the students and adults. Social design research is described by Gutiérrez and Jurow (2016) as a methodological approach committed to advancing social equity and learning in educational settings with the intention of transforming the educational and social environment for stakeholders belonging to nondominant communities. Gaps in RP literature call for clarity around methods and methodology with attention to quality (Weber & Vereenooghe, 2020; Zakszeski & Rutherford, 2021). Zavala (2016) defines participatory design research (PDR) as a categorization of discrete yet akin methodologies that include but are not limited to formative intervention research, social design experiments and community-based design.

The decision to use a mixed methods (MM) approach in this project was made to expand on the quantitative data through the qualitative data with the understanding that “the integration of objective, generalizable quantitative data with descriptive, contextual qualitative data are emphasized in contemporary paradigm that values diverse philosophical perspectives as a means to enhance the researcher’s ability to interpret very complex phenomena" (DeJonckheere et al., 2018, p. 1). The quantitative data provided a sense of the attitudes and beliefs held by teachers in our localized setting about student discipline and instructional practices which potentially influence how RP is understood and implemented in their classrooms. Pursuit of the qualitative data, because of the social design, was both the process and product of data collection and analysis. In the mixed methods literature, there is criticism of the nebulous accounts about the point of convergence in past studies (Zhou & Wu, 2020). This research strove to attend to issues of methodological clarity and transparency. This study was a complex convergent design in which the quantitative data and qualitative data collection occurred simultaneously, but analysis was initially independent of each other (Creswell & Plano Clark, 2018). The integrated research question, addressed by a synthesis of the quantitative and qualitative data, sought to shed light on the relationship between the attitudes and beliefs of the broader school culture informed by the quantitative data and the possibility of teacher strides toward a greater SJE orientation as a result of participation in a community of practice made visible through the qualitative data. The overarching questions this research sought to answer were: In what ways do teachers understand SJE and RP? In what ways does fostering a STEM focused teacher community of practice center equity? In what ways does participation in a teacher community of practice focused on science and literacy integration serve as a mechanism to surface the racialized nature of the wider educational system?

Positionality Statement

This work is informed by my own history and by the stories of my family, a work in progress. There are aspects of me that just are. I am a cisgender white woman and as such function from a place of privilege. Aspects of me have changed with time. I am now a middle aged, upper middle-class landowner, increasingly well educated, wife of thirty years and mother of adult children raised with Buddhist and Quaker values and traditions. Over the years I have cultivated my interests. I am an artist, a naturalist, an athlete, and a cook.

Milner (2007) suggests researching self by beginning with cultural and racial heritage and then reflecting on the context of how this sense of self shapes our research. Reflecting on cultural and racial heritage is a complicated and privileged process. The scope of this manuscript will not allow for extensive explication of my cultural and racial heritage. I will share that my extended family is biracial and multiethnic. I came up witnessing the good, the bad and the ugly. It made an impression on me.

How I understand the role of education came through key family role models and through my early years as an educator. Although I have as much white European heritage, I identify as an American Arab because of my relationship with my Syrian grandmother. The middle eastern legacy shows up in our family food, furniture, art and objects passed down. There is privilege in the formative years I spent with her. The Syrian family thread is documented back for centuries. There is also privilege in knowing where you came from. I recognize this. Part of the significance I place on education came from knowing her story, as the first Muslim woman and only second woman to graduate from the University of Beirut in the mid 30's, education correlated with freedom.

Education as a path for doing good in the world was modeled by both my parents. While my father was a career Air Force officer, he was known as a soldier scholar. Trained as a cultural anthropologist, he was West Point's first Diversity officer brought in to prepare the faculty for their first female cohort. As a systems theorist he strategized and authored the Mid-Atlantic Nuclear Disarmament Treaty between NATO and Russia. My mother was a TESOL educator. She spent her entire career working with newcomers from around the world and students from marginalized populations. The lesson I learned from my parents was that education has the capacity to catalyze change for individuals and communities, locally and globally.

The early years of my teaching career began in a Quaker school. The school itself enjoyed a very diverse community in terms of race, gender, religion, socioeconomic status, and ability, and was welcoming of the LGBTQ community. In Quaker education, Quaker values called the SPICES are woven through the curriculum and professional learning. SPICES is an acronym for: simplicity, peace, integrity, community, equity and stewardship. One value was focused on during monthly faculty meetings. In my last year at the school, I co-led all the professional learning focused on equity. My partner was the only teacher of Color in our faculty. Together we spent the year prior going to classes, workshops, and conferences to properly prepare to work with our colleagues in navigating the process of thinking deeply about equity in our classrooms through our personal identity work (Tatum, 1992). Fortunately, a few years earlier, an organization that was to become IIRP piloted professional learning in RP at our school. The setting was conducive to restorative work because of the already well-established Quaker values. We engaged in RP professional learning intensives twice a year, every year, readying our faculty for the hard conversations. Working with my friend, trying to lead such delicate work at the beginning of my career in the classroom, navigating tears, anger and new

restorative paths forward made a huge impression on me. It compelled me to go Back-to-School and to transition to high needs school settings.

Tuck and Yang (2012) call for compelling theories of change, research that is a creative production, as opposed to (re)production of hurtful/harmful practices, one that engages mentorship, refuses to emphasize damage or to traffic pain stories. Thoughtful examination of the motivation behind my research assists with being mindful of what Tuck and Yang refer to as Settler Moves to Innocence. Reflection of my story of becoming is a mechanism for evaluation of the research I embark on, helping me to recognize that the research design is "the connective process that constitutes externalized cognition" (Sheehan, 2011) and is not just a means to an end.

The Broader Problem Space: Institutionalized Struggle Over Time

In her thoughts on a post-pandemic pedagogy, Gloria Ladson-Billings (2021b) reminds us that returning to "normal" for Black students means returning to low achieving performances, less qualified teachers, disproportionately harsh discipline policies, an increased likelihood of being placed in special education and confronting retention, and a decreased likelihood for participating in gifted and talented instruction. Disrupting the racialized educational system in our country requires being explicit about race, racism and the impact on educational opportunities (Howard & Navarro, 2016). Nonetheless, researchers and practitioners continue to wrangle with what tangible equity oriented educational tools look like.

Restorative practices is an example of an equity oriented educational strategy intended to address Restorative Justice in Education. The overview of RP by IIRP states that it "is a social science that studies how to build social capital and achieve social discipline through participatory learning and decision making" (Wachtel, 2016, p.1) to be proactive and in place before problems

arise. Yet, a disconnect exists between the proactive intentions stated by IIRP, the responsive stances that are often taken up in educational settings and acknowledgement of the racialized nature of the system that the educational community is working within. Maynard and Weinstein (2019) introduce their book *Hacking School Discipline* by highlighting the disproportionality of discipline policies in the American educational system, noting zero tolerance policies that routinely target students of Color. They cite IIRP's claims that RP "helps to: reduce crime, violence, and bullying; improve human behavior; strengthen civil society, provide effective leadership; restore relationships; and repair harm" (p. 11). They adopt the approach that it is an educator's role to "teach learners how to behave" (p.13) through constructive means going on to say that students today are functioning in a more complicated world while not clearly calling out the roots and repercussions of the radicalized punitive measures that are aimed at students of Color. Despite best intentions, RP continues to function within the constructs of a "system that supports teachers' beliefs and teaching practices that criminalize boys of Color" (Basile, 2021, p.203) entrenched in efforts to fix the child rather than the system itself. Skiba et. al. (2014) recommended that disciplinary concerns be viewed as matters of equity tied to student instruction. They suggested that proactive steps that avoid the need for reparation include elevated academic rigor, cultural responsiveness, and the fostering of bias-free learning settings.

Fostering racial consciousness in educators necessarily involves intense scrutiny, self-reflection, and a grasp of both personal and institutional historicity (Howard & Navarro, 2016, p.9). Policy around teacher professional development nurturing the relationships between teachers and students, as well as improved student engagement, may be a starting point for addressing disciplinary disparities (Skiba et. al., 2014). While this is true, educators need to become cognizant of the necessity for change in our school systems with an awareness that

"centering race and understanding of Whiteness is the first step to not only recognizing a need for change but understanding the urgency of self-reflection as a foundational and purposeful act toward anti-racist leadership and teaching" (Mansfield et al., 2018a, p.12). Reflection of principles individually and communally lead to the degree to which RP is positively impactful on students and the community (McClusky et. al., 2008).

However, improper implementation of RP contributes to reproducing surveillance and exclusionary approaches in the classroom that focus on fixing children rather than addressing issues with the system (Lustick, 2021). RP initiatives that engage top-down or color- and power-blind models omit explicitly attending to racial justice (Gregory & Evans, 2020).

While research exploring RP implementation is still burgeoning, clarity about the efficacy of RP implementation is nebulous (Weber & Vereenooghe, 2020). Additionally, there is little research investigating the relationship of RP implementation and teachers' experiences with implementation (Weber & Vereenooghe, 2020). Within the teacher learning field calls exist for professional learning that: 1) foster in teachers a more robust understanding of their practice, classrooms, and students; and 2) builds on teachers existing knowledge, is inquiry-based, collaborative and open-ended (Mockler, 2011). To do this in the larger context of a racialized educational system as a path toward disruption requires that teachers' professional learning simultaneously attend to differentiation in identities and ideologies of the participating teachers as learners; spotlight the co-construction of power, identity and ideology that occurs through interaction; explore how these dynamics are shaped by the learning environment; be mindful of historicity of all involved; and analyze the representational and discursive mechanisms mediated by the teachers as learners while they navigate powered relationships (Philip & Sengupta, 2020).

In this study, my partner teachers and I worked to confront the racialized bulwark of the American educational system (Ladson-Billings, 1995; Martin, 2013; Milner, 2007) by building a community of practice as educators at an elementary school in which RP was adopted but not fully utilized in a transformational way. The professional learning that developed through the participatory design of this project engaged in RP with the intent to (re)shape our educational setting by creating a space for genuine teacher collaboration in which productive dialogue was nurtured, encouraging transformation through personal and professional exploration of RP in service of Social Justice in Education through a community of practice focused on STEM and literacy integration.

Localized Opportunity Space for Problems of Practice

Context for This Work

Beechwood Elementary School (BWES), a K-5 school, was located in a small town in the Southern United States and was partnered with a nearby university in 2018, the result of a state mandate. The university provided human and monetary resources, a board and liaisons for support and oversight of pre-service teachers. A Title I school, over 86% of the kindergarten through 5th grade at BWES identified as students of Color during the enrollment process in the school year, 2022/2023 (National Center for Education Statistics. (1996). [Washington, D.C.]: [NCES]).

For the last four years, my role at the school was STEM support for all K-5 teachers. In that role, I designed and ran formal professional development for the staff and pre-service teachers, worked with classroom teachers to write and implement science and engineering curricula, as well as supported teachers in project-based and phenomenon driven inquiry with their students. Prior to working at the elementary school, I had already developed relationships

with several of the teachers through the university STEM Teacher Leader Network, which I co-founded while still a classroom teacher, and through working as an instructor at the university's summer writing camp for children. As a preliminary step to the IRB process, I had to apply through the university for permission to engage in research at the school. As is expected in new ventures, the school had undergone a fair amount of turnover both with the university entities, faculty, and staff in the years I was present.

The year after the elementary school and university partnership began, the school adopted RP. Beechwood Elementary was in its fourth year of using RP during the initial data collection phase as part of the pilot study for this dissertation work. Together with partnering teachers and leadership at the research site, two problems were identified with RP implementation. First, the application of RP was uneven across the classrooms. Second, uneven RP implementation affected adult spaces also. RP was not necessarily enacted when teachers, staff and faculty were working collectively, negating opportunities for teachers to both benefit from a restorative space and to practice enacting a restorative space.

The sense of patchy execution of RP by teachers in classrooms was supported by this study's pilot survey, used for qualitative purposes, designed in collaboration with school leadership and circulated in April of 2022. When asked about their views on the implementation of RP at the school, responses included:

> *room for growth, implementation varies by teacher and sometimes by grade level as well.*

> *I think implementation is at different levels depending on comfort level & teacher's belief/confidence level with the process.*

> *I do not think that restorative practices are being effectively implemented at our school.*
>
> *I believe as a school we are lacking in communication, the restorative process is incomplete, so it is not as effective as it is designed to be or it could be.*

Amplifying these remarks, the state Teacher Working Conditions survey captured these sentiments. The survey has been conducted throughout the state every other year since 2018, the year the partnership between the university and elementary school began. Restorative practices were adopted by the school in 2019. Question 5.1.c on the survey asks whether policies and procedures about student conduct are clearly understood by the faculty. In 2018, 30.3% of respondents from the school disagreed or strongly disagreed with this notion. By 2022, those that disagreed or strongly disagreed swelled to 62.96% (Appendix A, Table A1). Asked about students adhering to school rules of conduct in the spring of 2022 survey, 60.82% agreed statewide. Conversely, in this setting committed to RP only 29.63% agreed that students followed the code of conduct (Appendix A, Table A2), suggesting the disjointed nature between RP implementation and student understanding of expectations for their conduct at school. Most teachers shifted from feeling they had a moderate to large role in establishing student discipline procedures in 2018 to having a small role or no role by 2022 (Appendix A, Table A3). A further example of some of the disconnect between RP and our school is illustrated in one of my journal entries.

> I sit here in room 16 wedged between Ms. Lewis and Ms. Mason. I have spent all morning listening to them yell. During [specials] Ms. Mason had one young man sitting in the hall. I offered to take him off her hands. We sat together in room 16. I read him my latest version of Carlos's Boots. He gave me feedback about the science words. We had a nice conversation. He had absolutely no idea why he was in trouble. I had some idea because I had heard Ms. Mason

> scolding him earlier. We wrote her an apology. I showed him how to take deep breaths when he wanted to get wiggly. It is a start. (Journal entry, 1/14/2022)

This brief snippet of a journal entry captured in part issues of power struggles that are a routine occurrence in many schools between teachers and students. Caught in traditional approaches to classroom management, teachers fall back on exclusionary and surveillance strategies. This journal entry further supports the notion that in this setting, neither the student nor the teacher used RP tools to meet the child's needs and align them to the teacher's expectations.

Uneven implementation of RP is problematic for the teachers as well as the students. Potentially, when adult spaces enact RP, the setting becomes a site for teachers to learn about RP through engagement with RP. Through these shared experiences, the possibility of a community of practice emerges. In this setting, RP in adult spaces were inconsistent.

> Later I had a quick chat with Ms. Rayne. She was feeling down. Collaborative conversations are very demoralizing for her. She said there seemed to be no shared direction or vision at the school. She described how she used to be able to address a kid in the hall who needed guidance by asking, "How do we do things here at…" or "Here we…" She said that she feels like there is no community. (Journal entry, 3/16/2022).

Ms. Rayne expressed a sense of lacking community and a shared vision. With the understanding that RP is the proactive enactments of the community towards developing a sense of well-being for all the involved individuals through learning as belonging and doing, building a sense of collaboration and community with faculty and staff was an essential element of RP for the adults. This opportunity space for development was supported by the state Teacher Working Conditions Survey data. Echoing Ms. Rayne's sentiment that there is no shared vision, the survey documented an 18.86% drop between 2018 and 2022 in teachers' perceptions of shared

vision (Appendix A, Table A4) at the school. There was an increase in teachers who disagreed or strongly disagreed that there was an atmosphere of trust and mutual respect from 21.21% in 2018 to 40.74% in 2022, signaling a growing disconnect between faculty, staff, and leadership (Appendix A, Table A5). However, it is important to pause and point out that in the 2022 survey more than half the teachers reported positively to the question of trust and respect. These figures suggested an opportunity space for RP to be engaged to nurture sentiments of community and connection with the adults, to shift perceptions and close the distance between leadership and teachers.

The survey defined collaborative planning as "time spent working with other teachers within or across grade and subject areas as part of a Professional Learning Community to plan and assess instructional strategies" (NC Teacher Working Conditions Survey, 2022, Q2.2.b). At BWES the collaborative planning time in the category "less than or equal to 1 hour" per week increased by 30% between 2018 and 2022. Teachers reporting that they collaboratively planned for one to three hours fell from 52.63% in 2020 to 33.33% in 2022, (Appendix A, Table A6) highlighting the perceived reduction of time spent in collaboration. Our teachers reported time spent in professional development, defined by the survey as "all opportunities, formal and informal, where adults learn from one another including graduate courses, in service, workshops, conferences, professional learning communities and other meetings focuses on improving teaching and learning" (NC Teacher Working Conditions Survey, 2022, Q2.2.h), increased in the category of "less than or equal to one hour" by 3.7% between 2018 and 2022 and decreased by the same percentage in the one to three hour category (Appendix A, Table A7). While grade level teams came together weekly for a meeting called "Collaborative Conversations" and were

expected to meet for planning at other times in the week, the survey indicated that there had been a steady erosion in how teachers view collaborative and professional learning opportunities.

The opportunity space for fostering RP through the development of a community of practice was reinforced in how teachers' views on teacher leadership shifted since 2018. At our school there was a drop in teachers feeling they were recognized as educational experts, shifting from 90.91% in 2018 to 66.67% in 2022 (Appendix A, Table A8). The survey reflects that a growing number of teachers did not feel "trusted to make sound professional decisions about instruction" (NC Teacher Working Conditions Survey, 2022, Q6.1.b) increasing from 15.79% in 2020 to 33.34% in 2022 (Appendix A, Table A9), more than doubling in just two years. While more than half of teachers in 2022 still felt the leadership leaned on them to make decisions on educational issues, those numbers declined from 93.94% in 2018 to 66.67% in 2022 (Appendix A, Table A10). While an attribute of RP is as an armature for facilitating group decision making when solving problems, in our setting, an increasing number of teachers felt they did not have an effective process in place, growing from just 9.09% in 2018 to 37.03% in 2022 (Appendix, A11). The responses to the NC Teacher Working Conditions survey were in tune with the following survey responses about RP at our school from August 2022. While there were only four respondents on this occasion, two shared:

> *I like it and use it but need whole school buy in for it to be effective.*
>
> *I think we are well on our way to incorporating them across the board. I would like to see them utilized with staff more, however.*

The unevenness of RP implementation in the classrooms and inconsistent use of RP as a tool for building a professional community initially made BWES an excellent site for this project. During the data collection period, prior to the winter break, the school staff was

informed by the university that the partnership with the school district was not going to be renewed and that this would be the final year of the school. This is relevant in that it informed how the collaborators in this project came to be involved, uninvolved and the ways they participated.

Gaps in the Literature

To the credit of participating teachers and leadership, we set out to collectively address gaps in the RP, teacher learning and PDR and mixed methods literature. Research in the effectiveness and implementation strategies for RP are erratic at best (Weber & Vereenooghe, 2020). In a systematic review, Zakszeski and Rutherford (2021) related three overarching limitations in the RP literature. First, was a failure to intentionally operationalize how RP is defined. They called on future research in which specific practices are articulated, describing "conditions for implementation both for the benefit of the practice-focused reader who is looking to learn restorative practices and for the research-focused reader who is looking to review a replicable methodology," (p.382) noting that the results will have little meaning unless the audience is fully able to understand what the restorative practices work actually was. Second, the authors pushed for future research to include evaluating implementation fidelity, pointing out that not doing so is a Type III error and will obscure whether the practices did not work or were not implemented. Lastly, they called for sample diversity across more settings with students from minoritized populations. Zakszeski and Rutherford noted this would then either validate the use of RP or shed light on the need for ongoing program development and evaluation. They ended their paper with a call for "researchers and practitioners to strategically partner to design, conduct, and disseminate rigorous evaluations of restorative practice implementation that address the methodological limitations" (p. 383) they described.

Weber and Vereenooghe (2020) also found limited high-quality studies in their systematic literature review, pointing out that many RP studies were vague in reporting their methodologies, making the effectiveness of RP unclear. They note RP is still nascent and found that the effectiveness of RP for students was thus inconclusive and investigation of the impact of RP on teachers in terms of stress and job satisfaction was remarkably lacking. Gregory et al. 's (2021) study supported this notion calling for future research to include teachers' and students' views as part of the implementation process to add to the validity of their findings.

Within the teacher learning field, calls for professional learning that foster in teachers a more robust understanding of their practice, classrooms and students need to build on teachers existing knowledge, be inquiry-based, collaborative and open-ended (Mockler, 2011). Such professional learning affords teachers opportunities to reflect on their practice and expand the tools for ongoing "reflection and learning located within an understanding of who they are and why they do what they do" (Mockler, 2011, p. 526). Admiraal et al. (2021) posited that thoroughly embedded interventions had a greater possibility for sustaining a culture of professional learning and collaboration, highlighting the rarity of such interventions targeting teacher-leaders, team leaders and school principals. Guskey (2002) called for studies working *with* rather than *on* teachers, emphasizing the need to examine teacher attitudes and beliefs through the development of more exacting measurements.

In the broader context of mixed methods research, design-based research is a means through methods and methodology for creating the conditions for teacher transformation, meeting the need for the creation of teacher tools focused on science and language integration (Fazio & Gallagher, 2019). The literature suggests that to expand on the field of participatory design research (PDR), ethnographies centered on the details of goal-oriented design and

implementation are needed (Zavala, 2016). Studies with a transformational orientation need ongoing evaluation of the research's merits and discrepancies particularly for the participating community (Gutiérrez & Jurow, 2016). To build on the field of PDR, Booker and Goldman (2016) identified four principles to inform future work: 1) ongoing and candid dialogue with stakeholders; 2) the space of learner and expert is shared; 3) iterative cycles of data analysis and design shape next steps and 4) eliminating cultural and individual deficit as an explanation for the phenomena. Bang and Vossoughi (2016) consider the possibility for future PDR to stress the "critical importance of the relations and histories that made change possible during efforts to share or expand localized innovations to new activity systems in ways previous efforts have often failed to do" (p. 188).

Nested in the broader methodological approach of MM, PDR offers insights into complex social conundrums and inequities within specific contexts (Mertens, 2013). As a newer methodological field, mixed methods have a number of opportunity spaces for researchers to contribute. The point of integration, quality and validity all are areas of concern (Fàbregues & Molina-Azorín, 2017; Onwuegbuzie & Johnson, 2006; Zhou & Wu, 2020). The integration of quantitative and qualitative data in mixed methods is the interplay between the complementary strengths of the data and a minimization of the weaknesses of the different approaches when used independently (Onwuegbuzie & Johnson, 2006). Mixed methods researchers are encouraged to consider the point of integration as both part of the process and the product (Zhou & Wu, 2020). Fàbregues and Molina-Azorín (2017) make three recommendations for contributing to the mixed methods community: 1) they call for more empirical publications specifically addressing quality; 2) they suggest the field decide on the language used to talk

about quality in MM; 3) and come to an agreement as to core criteria that characterizes quality in MM.

Purpose

This study was designed to build a community of practice with educators to explore proactive enactments of RP, through STEM and literacy integration, to foster transformation in our local context. The professional learning that formed from this work potentially serves as a springboard for future studies to begin to intentionally (re)shape educational settings, creating spaces for adult collaboration with an eye toward building robust learning communities with each other and in turn their students. Communities of practice nurture dialogue of competing ideas and tensions in a manner that are not only productive, but through discursive processes can become transformative, moving participants from points of contention and separation to being a space/place of connection ripe for learning and collaboration (Gutiérrez et al., 1999). Thus, providing educators time/space to do the personal and professional collective work necessary to bring about social change.

Transformative pedagogy requires creating a space that feels safe, fostering in each member a sense of responsibility to participate (hooks, 1994). Behaviorist approaches which define traditional school cultures, require teachers keep a tight rein on their students (Taysum & Ayanlaja, 2020) while the schools themselves are structured in a manner that conveys top-down messaging and de-professionalizing teachers (Milner, 2013). Such Behaviorist strategies and structures inhibit relationship building (Taysum & Ayanlaja, 2020). This study aimed to contribute possible pathways towards relationship building across all members of the school community through collaborative and discursive practices. Circles are a locus for equitable and productive discourse because they inspire a sense of safety, trust, encourage inclusivity,

collectivity, responsibility, and connection (Costello et al., 2018). Leveraging the notion of restorative circles, this study expanded the use of these collective spaces to harness the same community building outcomes through scientific argumentation and discourse. The project worked to design such spaces beyond restorative circles and into educator collaborative conversations and student science talk.

This study potentially added to the growing body of literature which demonstrates how innovative educational practices such as integrated curriculum, place-based learning, project-based learning, inquiry, family involvement and core STEM practices enhance student learning (Sias, et al., 2017) and might address deeply ingrained inequities in the educational system by designing curricula for inclusive and collaborative spaces.

The selection of mixed methods for this study sought to add to the richness and thickness of the data through integration of quantitative and qualitative data and aimed to address the complex phenomenon of RP implementation by creating inclusive and collaborative places/spaces for both students and teachers. A complex application of a convergent mixed methods research design and employing a participatory-social justice approach was appropriate for this study given the context of the phenomenon the research addressed.

Research Questions

The broader problem space of racialized inequity in the U.S. educational system, previous efforts in implementing RP, the agreed lack of success in localized school-wide implementation supported the use of participatory design which shaped the research questions we explored.

In the quantitative data the broader question examined: In what ways do teachers understand SJE and RP? This question was explored by answering the following: In what ways

do teachers perceive Social Justice in Education? In what ways do teachers perceive what RP is? In what ways are RP implemented? The overarching qualitative question investigated: In what ways does fostering a STEM focused teacher community of practice center equity? This question was explored by asking: How are teacher communities of practice cultivated to foster science and literacy integration? How does science and literacy integration create a space for RP in service of SJE? At the point of integration this study pursued the questions: In what ways does participation in a teacher community of practice focused on science and literacy integration serve as a mechanism to disrupt the wider racialized school system? In what ways do teachers' implementation of RP contribute to or trouble the reproduction of inequity?

CHAPTER II: THEORETICAL FRAMEWORKS

Theoretical Frameworks

Creswell and Plano Clark (2017) describe four discreet worldviews that inform mixed methods research: postpositivist, constructivist, transformative and pragmatist. In this work, however, I necessarily conceptualized the research design through both a transformative lens and a constructivist lens. A transformative perspective is political, social justice oriented, humanist, collaborative and seeks to be a catalyst for change (Creswell & Plano Clark, 2017). By using Critical Race Theory (CRT) as a theoretical lens to zoom in on the systemic power dynamics this study attended to, the need for a transformative approach was necessary. To visualize a methodology with a transformative worldview for this work, I applied Holland and Lave's (2009) Social Practice Theory, conceptualized from a constructivist stance. A constructivist worldview, according to Creswell and Plano Clark seeks "understanding", recognizing "multiple participant meanings", is socially and historically constructed, and aims to generate theory (p.36). Teacher learning in this research was both the process and the product. Without employing a constructivist worldview, true participatory design would have been challenging.

This chapter will explain the Critical Race Theory (CRT) and Social Practice Theory (SPT) frameworks that shape this study and how they have been synthesized. An explanation of communities of practice will frame how practice is understood in this research. The literature review will explore research on restorative practices, teacher learning, and the possibility of addressing Social-Justice in Education through STEM and literacy integration.

Critical Race Theory

Delgado and Stefancic (2017) describe the CRT movement as "a collection of activists and scholars engaged in studying and transforming the relationship among race, racism, and power…critical race theory questions the very foundations of the liberal order…" (p.3). Ladson-Billings (2021a) summarizes tenets of CRT outlined by Delgado and Stefancic as belief that racism is commonplace in the United States; interest convergent or material deterministic; and a social construct. Matters of racism encompass intersectionality and anti-essentialism and can be disrupted through voice and counter narratives.

Working from the assumption that racism is ordinary recognizes the American educational system is political (Martin et al., 2010). Theories of education and learning potentially (re)produce, foreground, shadow, shape, change or erase educational experiences for students of Color (Philip & Sengupta, 2020, p.5). A reflection of the sociopolitical context we live in, American education mirrors the racialized systems that sustain the status quo. Recognizing education as a sociopolitical context in this research presents a possibility for transformation. Drawing on Philomena Essed's concept of everyday racism and Eduardo Bonilla-Silva's racialized social systems, Martin (2009) argued that it is necessary to "move beyond the static notions of race to acknowledge that [mathematics] learning and participation, like many other areas in life, can be viewed as racialized forms of experience…" (p. 324).

The recognition of interest convergence and material determinism in CRT illuminates the tendency of White people to push for racial justice only when it is in their own best interest and maintains the status quo (Ladson-Billings, 2021a). Milner (2007) suggests tenets to disrupt interest convergence in teacher education in which social justice-oriented educators create a united front and develop goals, visions and use data to develop pathways to disrupt the status

quo. Central to acting in opposition to interest convergence is the acceptance of race as a social construct. That is, race, while not scientific, denotes social categorization based on random genetic variances manipulated as fodder to foster the apparatus for the White supremacy doctrine (Ladson-Billings, 2021a). Complicating the crisp edges of black and white, CRT accounts for intersectionality and the many complex ways identity and social assignments overlap while maintaining awareness that individuals, perceived or self-identified as part of a group; through words, thoughts, or actions, do not represent the entirety of the group. Voice and counter-narratives create a rich space for transformation. Ladson-Billings (2021a) is clear to point out that storytelling through CRT is not a platform for venting or ranting but rather a space for amplifying voices and designing for counter-narratives to foster opportunities for broad and systemic inequities to be surfaced and disrupted. Noguera and Syeed (2021) emphasize the relevance of spotlighting structural racism in education to foreground how opportunities or lack of opportunities are systemically shaped.

Social Practice Theory

Social Practice Theory digs into the concept of history-in-person positing "that persons are historically produced in practice in relation to the identities, cultural genres and artifacts that are central to cultural activities in which the persons engage" (Holland & Lave, 2009, p.5). Through Social Practice Theory there are several understandings that are relevant to this work. First, the definition of practice, adapted by Holland and Lave (2009) from Bakhtin, understands the actor/individual is shaped by people, institutions, and external/internal forces. As the actor/individual engages with these entities they take up the cultural resources: words, genres, actions, and ways of being, thus *becoming* in practice. As the actor/individual authors themselves in using the cultural resources accessible with/through the entities, the cultural resources are

shaped in relation. In other words, there is an entanglement between the actor/individual and entities, each informing how the other becomes in and as part of practice. It is very much relational. Authoring, then, is an individual's meaning-making as a function of participating in and through the multiple groups each with their own distinct ways of being and speaking, developed over time and through interaction with the individuals that make up the collective (Holland et al., 2001). Second, Social Practice Theory builds on cultural-historical activity theory, recognizing the emotion, motivation, and agency as integrated mechanisms in cultural-history activity theory. Third, Social Practice Theory is distinguished from cultural-history activity theory in that it makes sense of local practice in the context of "historically institutionalized struggles" (p.5).

Communities of Practice

Critical Race Theory and Social Practice Theory guided the theoretical framing for this study. In addition, the concept of communities of practices (COP) was foundational for understanding how the emergence and maintenance of a community of practice, as both the process and a product of collective activity, shaped my interactions with the participating teachers. This study focused on the conception and nurturing of a community of practice within the setting for the teachers as a means and a model for designing spaces that foster communities of learners in their classrooms with their students. Wenger (1998) introduced the idea of community of practice as an "entry point into a broader conceptual framework of which it is a constitutive element." This framework is a conceptualization of learning that plaits community, identity, meaning and practice together to understand learning as belonging, becoming, experience and doing. It is this notion that I developed my definition of RP from through a CRT lens.

Wenger theorizes the idea of practice as an action or activity, doing something that we draw meaning from in a historical and social context. The activity in a broader context allows for the complexity of where we are in the system to be factored in. Wenger's view of practice "does not reflect a dichotomy between the practical and the theoretical, ideals and reality, or talking and doing. Communities of practice include all of these" (p.48). Wenger goes on to operationalize *practice* as: meaning, community, learning, boundary, and locality.

Practice as meaning reflects the social negotiation of meaning, the interplay between reification and participation. In this framework, practice as a community has three components: mutual engagement, joint enterprise, and a shared repertoire. Mutual engagement encompasses the way individuals come together as a collective, defining the community of practice. Joint enterprise, then, is the means of building community through shared engagement and community maintenance. It is the collectively negotiated norms and ways of being as part of the group. Repertoires of practice are the enactments of ways of being in the community that are socially negotiated over time. Shared vocabulary, ideas, stories, and styles can all be reflections of a repertoire of practice. Gutiérrez and Rogoff (2003) make the distinction between participation and membership in cultural communities, highlighting how problematic the static treatment of membership in a cultural community is, instead encouraging researchers to adopt a cultural-historical perspective that recognizes the complexity of processes in an individual's engagement across many communities of practice. Their work suggests that researchers attend to promoting ways individuals might dexterously move between and across repertoires of practice, drawing on ways of being appropriate to a specific context.

Practice as learning necessitates understanding a community of practice as an entity that is ever emerging. An evolutionary space that is not fixed but morphs. Shifts in the collective are

informed by its historicity and that of the individuals that make up the group. Opfer and Pedder (2011) suggest that the process of understanding teacher learning must be conceptualized as a complex system, with many social moving parts that in all their interactions and fluctuations can lead to causal approaches. Teacher learning as a complex system considers the history of multiple entities intertwined: teachers, grade level teams, administrators, schools as part of districts, districts as part of larger systems. Learning *as* practice engages the processes of the community *in* practice. As a community's individuals work collectively, they develop relationships, recognize the shared mission, and hold each other accountable as they continue to fine-tune the repertoire of practice that characterizes the community.

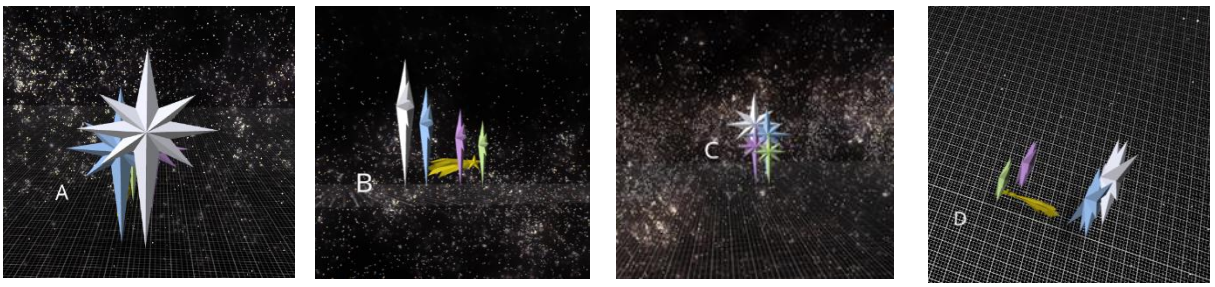
Practice as boundaries is developed as relationships evolve and repertoires are formed and negotiated, this becomes the edges of the group's identity. Boundary objects are tools or ideas that characterize or are identifiable to the group. Boundary objects in a community of practice might be artifacts like lesson plans or documents that a newcomer might not easily interact with. A newcomer to a community of practice may need to access boundary objects to be able to fully engage in the community. Such boundary objects might be the literacies necessary for understanding the language used to reference artifacts such as a grant application or ideas that undergird a storyline. Brokering can shift boundaries as individuals in different communities spend time connecting.

Practice as locality speaks to the configurations of communities of practice as part of other systems either locally or globally. As an example, in education, collaborating teachers develop a community of practice with localized struggles that are contextualized at the classroom level, which are in turn shaped by school culture and institutional pressures.

Constellations

Further complicating the idea of the locality of practice, Wenger introduces the notion of constellations of practice. Constellations from this perspective denote an array of entities comprised of actors/individuals configured in relation to each other. These constellations are comprised of communities of practice which can be observed to overlap or crossover in ways that include common history, members, shared missions and/or artifacts, geographical proximity, or being under the auspices of a common institution. Each of the entities, although not necessarily the same scale, in proximity or even of the same composition, are entangled in ways that depend upon the vantage point. As a community of practice, therefore, the CoLab was to a point, demarcated by the collective and individual members negotiation of the constellations each member engaged in, in a given moment and over time. The entities that form the constellation are not fixed, but amorphous, being shaped and reshaped by and through the nature of engagement of individual members that make up the collective, rendering visible configurations and features of the constellation, the entities that comprise it, and the role of the members, depending on perspective taken. To view constellations of community as solely nested provides depth but misses the dimensions. Using the synthesized theoretical framework was an effort to make clearer the dimensionality in addition to exploring the depth. To illustrate this dimensionality, I created a three-dimensional model using CoSpaces. Figure 1 represents a

Figure 1. Constellation Views



constellation from varying perspectives of position and metaphorically points in time. Imagine this constellation to depict the professional constellation of a teacher at BWES as they move through the wider educational system located within the starscape of U.S. educational system. The white star represents the entity of the state educational system. In view A the state educational system itself dominates. Viewed head on and up close, it appears to overlap with the smaller purple star depicting the district, the blue star which portrays the university and not quite obscured is the green star portraying BWES. Not visible from this vantage are the presence of teachers. A shift of the camera counterclockwise in view B, there appears to be an alignment of these entities. Now present we see a teacher, shown as a yellow shooting star, embarked on a trajectory connecting the university, district and BWES. View C moves the perspective back slightly and clockwise, to face BWES, the green star. It becomes apparent there is not really an alignment between entities. The university and school are in alignment, but the relationship to the district is off center and more clearly aligned with the state institution. The teacher again is unseen. Zooming out and from above in view D makes visible the broader panorama and brings the BWES teacher back into the picture. BWES from this angle seems to be closer to the district than perceived from other angles, while the university no longer overlaps with the district, it does overlap with the state entity. Although still in contact with the school, the teacher's trajectory moves away from the university, is adjacent yet not aligned or overlapping with the district and appears that in time will move through BWES.

For the purposes of this study, constellations were relevant in being cognizant of the locality of the individual members of the CoLab, as well as the collective, not just in a given time and place, but *across* time and place. Being aware of "the context of constellations of practices, the local and global are not different historical moments in an expanding world. Instead, they are

related to levels of participation that always coexist and shape each other" (p.131). Consideration of the teacher's constellations and where and when they are visible was important to this work because it aided in understanding particularly the teacher's intersectionality, it assisted in not losing sight of the teacher's historicity with each of these entities, and gave some insight into the importance of where they were on the continuum of membership to participation in each of these communities which in turn shaped their identity, attitudes and beliefs about teaching.

The Problem of Practice

Lampert (2010) muses on the meaning of practice in the literature and concludes multiple interpretations are reflected. Ideals, actions, and tools encompass notions of what practice means in the literature. She breaks with Wenger in suggesting there is a dichotomy between theory and practice in which theory ties to thinking while practice is associated with action, giving rise to ruminations in the literature about theory-in-action. Teaching practices understood as competencies are reflected in the use of the expression "best practices" and the ideation of "core practices", "high-leverage practices" and "generative leverages' (p.61). Practice as rehearsal shows up in the literature, but, as Lampert points out, is relative to the feedback that is received.

Professional opportunities for teachers are often one and done sessions that are perfunctory, removed from significant topics on curriculum and learning, and are piecemeal (Ball & Cohen, 1999). When thinking about designing for teacher learning, the experience needs to consider what teachers need to know to use the new instructional strategy or tool. Professional education in which learning in practice is foundational identifies enactments of practice and creates toolkits that support engagement in pedagogical practices (Ball & Cohen, 1999). As with so many other descriptors of professional applications, the term "practice-based" is nebulous (Forzani, 2014). In teacher learning settings, "practice-based" may point to immersion or

modeling. It simultaneously refers to instructional strategies and professional ways of being and experiencing how to teach (Forzani, 2014). Having high expectations of students' capacity to learn, situational uncertainty and disciplinary content are understandings of what teaching is that shape our conceptualization of core practices. They foreground the relational nature of teaching and press the profession to figure out how to design learning opportunities that are at the core of what we do (Forzani, 2014). Communities of practice that establish “professional learning toward the joint professional study and analysis of teaching and learning would knot professional development inextricably into the practice of teaching" (Ball & Cohen, 1999, p. 19).

Synthesizing Critical Race Theory, Social Practice Theory and Communities of Practice

This RP project was rooted in and brought together assumptions from both Critical Race Theory (CRT) and Social Practice Theory. Tichavakunda (2019) noted the limitations of research through solely a CRT lens, positing agency and intragroup diversity are not always considered. He similarly critiques Bourdieu’s work in conceiving of social and cultural capital, noting the theories lacked perspective on reflexivity and the contextualizing of the racialized conditions in the United States. Tichavakunda explored the dialogue between the two stances, concluding, “the intersection of race, inequality, and education is complex and continually evolving. As such, the frameworks we use must be similarly nuanced, evolving to better engage with this complexity” (p. 664).

In this work I synthesized CRT, SPT and COP by utilizing three key constructs of SPT through the lenses of four CRT tenets: 1) Racism is normal, 2) Race is a social construct, 3) The role of intersectionality and essentialism, and 4) The use of voice and counternarrative. First, the social practice perspective taken in this research centers the institutional struggle of the American educational system with its racist anatomy and as such is complementary with the

tenets of CRT that racism is normal and a social construct. Second, the COP notion of constellations of communities speaks to the CRT principles of intersectionality and essentialism that account for so much of the complexities of interaction of the participants in the community of practice. Lastly, practice as meaning, community, learning, boundary, and locality was addressed with a social justice orientation when guided by the CRT precept of voice and counter narrative as a means of considering the lived experiences and realities of the participating teachers and their students of Color.

Acknowledging and being mindful of CRT insights in relation to SPT through the engagement in/with/of a community of practice framed how I conceived of practice, community, and the feasibility of transformation in individuals and collectives in this work. In this work, practice through the SPT lens examined the way teachers wrangled with/in/through their professional practice, their intersectionality, ways they identified both professionally and personally, and their historicity. Additionally, practice through an SPT lens aided in noticing the tension the teachers at BWES experienced between implementing social justice-oriented practices like RP within an institutional structure that continued to struggle with the racialized nature of the broader system.

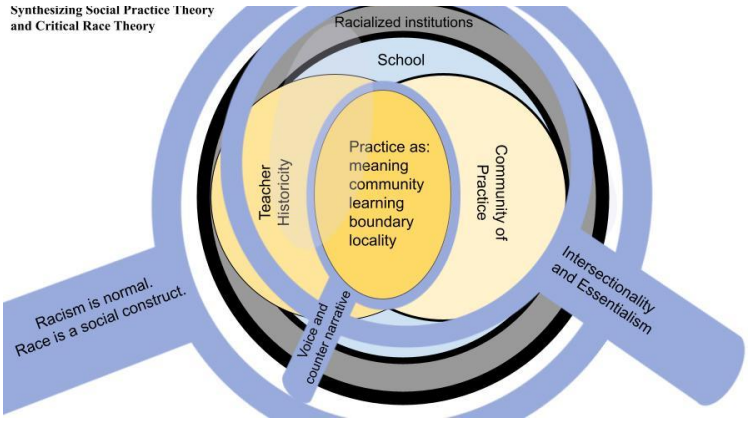
The CoLab as a community of practice provided a framework for both planning for teacher learning, as a measure of the collective as a community of practice and in how I interpreted the interactions of the group and enactments of integrated STEM/literacy and RP. Wenger cautions against romanticizing or denigrating communities of practice, but instead suggests acceptance of communities of practice as an actuality in social life. In this study, recognizing the complexity of practice as meaning, community, learning, boundary, and locality aided in designing *for* teacher learning through collective engagement in practice. I used the

notion of the problem of practice to understand how a community of practice might become a space/place of belonging through learning and doing. Practice as meaning was understood to be the way we collectively engaged in sense-making of STEM/literacy, SJE, RP and in what ways they related. This experience was a space/place of negotiated ideas and understandings in which participation affected the meaning of the concept in focus while at the same time affecting the individual. In this study, practice as community was examined and designed for mutual engagement, joint enterprise, and shared repertoire. By involving these three dimensions of community, the potential for learning came to be. Practice as learning is both unsettling and hardy, a burgeoning and dynamic enterprise. The interactions of participation in practice as community fostered the conditions for learning. Awareness of practice as boundary and locality connected the individual members of the CoLab and the collective both to each other strengthening relationships through mutual engagement, while at the same time located members and the collective across the constellations, shared or not, that shape who we are and how we engage in our work. Practice as boundary and locality account for the edges and overlaps in constellations, as well as the history of the entities and the individuals that count as members on the continuum of participation. These understandings of practice in this study exemplified the nature of participatory design as both process and product.

Figure 2 illustrates how I applied the CRT lenses in this work to the social practice and communities of practice constructs. The large lens of racism as commonplace and race as a social construct worked to keep centered the systemic struggle that educators are inherently members of through participation in the institution of American education at the national level trickling down to the localized school context, accounting for the individual historicity of each educator as an individual and as part of a community of practice. This wide lens served to remind

and routinely center the social justice impetus that was the core of this study. The mid-sized lens focused on the intersectionality of the participating teachers' historicity and the unfolding community of practice thus creating a space/place for greater visibility into the processes of practice. This lens was also employed to shed light on where and how essentialism surfaced as part of the broader structure. The smallest of the lenses was the work of the CoLab. As a space/place of negotiated meaning and repertoires of practice, the CoLab became a site to amplify voices and bring into being counter narratives both of students lived experiences and the teachers. Active involvement and extending the social world by recognizing the relationship of the present to the past created the conditions for imaginings and reflection thus making room for a learning community, which is "fundamentally involved in social reconfiguration: its own internally as well as its position within the broader configurations" (Wenger, 1998, p. 220). By being a space/place of/for reflection, the CoLab made room for other voices and stories of lived experiences.

Figure 2. Synthesizing CRT, SPT and COP



Designing for Teacher Learning

The question of how to design teacher learning toward a systemic social-justice orientation is a perennial one. In this study, in consideration of the overlap between CRT and

SPT, I sought to acknowledge and thoughtfully design learning for teachers that keeps in mind the complexity of the racialized struggles in our educational system across time. Using communities of practice as the armature of designing for teacher learning and transformation, this work shares the principles summarized by Wenger about learning. Learning is natural; a process of meaning making; experiential and social; entangled with social energy and power; relational; and is a concern of engagement, imagination, alignment, and the interactions between global and local. Often the question is asked: How do we get teachers to buy in? This work leans into ways that participation in a community of practice nurtures a sense of competence and belonging which in turn creates the conditions to potentially foster teacher buy-in.

Wenger suggests that the possibility for learning is found in the nondeterministic interplay between an experience of meaning and a regime of competence. The constituents of a regime of competence include relational reciprocity, a feeling of accountability to the collective aims, and participation in negotiation of the repertoires of practice. It is through the enactments of and participation in a community of practice, that the meaning of competence as part of said group, considered an outsider or somewhere along the continuum, is fostered. The tension that arises between the action of reconciling an experience of meaning with the regime of competences results in the possibility of learning in practice. The elements of a regime of competence then become integral to identity formation. In other words, competence occurs as the individual engages with the group in negotiation of the repertoire, the interaction shaping and reshaping the repertoires of practice, nurturing a deeper commitment to the communal enterprise. From growing competence as part of the community through mutual engagement, shared repertoire and shared goals, a sense of belonging blossoms. The burgeoning sense of competence unfolds along a continuum of belonging which the individual travels through participation in the

group, shifting from the edges of membership with relatively little engagement through increasing degrees of participation. Wenger determined belonging is fostered through the individual's engagement, alignment, and imagination. While not mutually exclusive, each of these "modes of belonging" are characterized by different processes. Engagement might be developed through participation of shared activities, the aggregation of shared experiences, or the creation of a local regime of competence. While imagination as a path to belonging might include shared stories, documentation and/or reinterpretation of histories, or exploration of a new way of doing things. The act of reification of artifacts possibly provides tools for imagination. Participation through alignment may be recognized by concerted energy directed toward the collective joint enterprise, negotiation of ideas and perspectives, delineating expanded visions and acts of unity, inspiration, or persuasion. Belonging, in which the possibility of alignment emerges, opens the door for boundary practices "of people with multi membership who can straddle boundaries and do the work of translation" (p.187). Thus, creating the conditions for potential transformation in both the individual and the collective.

Literature Review

In this review I will first explore the treatment of restorative practices in the literature, deliberating on key findings in the field including limitations and concerns that have been raised. Next, I will present a possible explanation for some of the disconnect in the RP community between the posits of guiding initiatives and implementation, in addition to possibilities the literature raises for making true inroads in disrupting systemic racism in schools. I will then examine the role teachers' identity, attitudes and beliefs play in educational transformation. Lastly, I will reflect on how the literature might support the integration of science and literacy as

a means of addressing social-justice issues by designing shared spaces of learning for both students and teachers.

Considerations of Restorative Practices

The Relationship Between RJE and Restorative Practices

While RP emerged from restorative justice approaches (McClusky et al., 2008) the terms RP and restorative justice are often used interchangeably (Lustick 2017). Operationalizing RP and the parlance applied to RP approaches discussed in the literature are still not consonant (Weber & Vereenooghe, 2020). Also not in agreement are the approaches and language used when implementing restorative practices (Vaandering, 2013). Restorative justice in education was born out of the Restorative Justice movements in judicial arenas but draws on indigenous wisdoms from around the world predating Western society (Evans & Vaandering, 2016.) For instance, concepts of justice were gleaned from the Navajo people's understanding of harm as being emblematic of disconnection remedied through healing and reconnection. Similarly, the Māori tribes modeled peacebuilding and conflict resolution through group conferencing (Evans & Vaandering, 2016). Indigenous restorative theory was enlisted by the Western criminal justice system seeking an alternative path (Lustick, 2017). In 1994 the American Bar Association formally recognized Restorative Justice (Evans & Vaandering, 2016). The seeds of indigenous restorative concepts like building community and connection, conflict resolution circles and repairing harm found fertile ground in American education by the early 1990's in response to zero tolerance and other policies of surveillance and exclusion (Davis, 2019).

Restorative justice in education is a proffer to recalibrate modes of being in educational spaces from social control to social engagement. Restorative Justice in Education is the intentional and purposeful stewardship of relationships to create spaces of belonging (Evans &

Vaandering, 2016). Still considered in its nascent stage (Gregory et al., 2016), the definition of restorative practices (RP) remains murky (Weber & Vereenooghe, 2020). Lustik (2017) notes that restorative justice, restorative discipline, and RP all draw on restorative theory. In general, RP is considered a way of being in an educational setting that strives to be non-punitive, prioritizing relationships (Gregory et al., 2021). The International Institute for Restorative Practice (IIRP), the leading accredited educational institute in this country for RP, makes a distinction between restorative justice and restorative practices. They see restorative justice as falling under the auspices of RP, used responsively, while RJE focuses on repairing harm (Wachtel, 2016). Restorative practices, therefore, encompass a continuum of enactments, from proactive leveraging of community building to repairing harm through restorative strategies when it occurs (Hulvershorn & Mulholland, 2018). Weber and Vereenooghe (2020) note the literature views RP as "an approach which provides a philosophy and framework of proactive and reactive methods toward building and restoring relationships in schools and thereby reducing conflicts" (p. 1). While restorative practices is defined in the *Restorative Practices Handbook* (2018) as a belief "that decisions are best made and conflicts best resolved by those most directly involved in them" (p.7). IIRP views connections forged through trust and shared norms as the bulwark of social capital (Wachtel, 2016). Restorative practices used proactively are implemented to "build social capital and achieve social discipline through participatory learning and decision-making" (Wachtel, 2016, p. 1).

Restorative Practices in the Literature– Key Findings, Limitations, and Critiques

Research in the effectiveness and implementation strategies for RP are uneven at best. A systematic review of 17 studies Weber & Vereenooghe (2020) found two outcomes they framed as primary and secondary. The primary outcomes of these studies related to student behavior and

conflict. The secondary outcomes surfaced four categories: school climate, teacher's perspectives on implementation, intrapersonal factors, and interpersonal relationships between teachers and students, and students and their peers. The authors concluded that the field of RP research is still very new, noting nearly half of the included studies were conducted in the two years prior to the review. Their research suggested student happiness and engagement was positively impacted when proactive measures were used. However, that was not the case when reactive methods were also implemented. Overall, the effectiveness of RP for students was inconclusive and research on the teacher impact was notably lacking.

A two-year study across eighteen schools in Scotland found that RP had greater opportunity for success with faculty that were reflective and when students were engaged in active learning. Reservations were raised about RP being transformative in light of existing policy and classroom management that seem to work in opposition to the efforts of RP to build community (McClusky et al., 2008).

From the educational psychology lens, Ingraham et al. (2016) explored implementation of RP through a three-year participatory action research project in a multicultural urban setting. This work engaged RP at home and in schools with the aim of investigating the feasibility of implementing RP with a high English Language Learner community. There was favorable evidence for students, parents and teachers that RP addressed conflicts across settings, creating the feeling of a safer environment for all stakeholders.

In a relatively recent study "from the field" (Mansfield et al., 2018b), the researchers related implementation of IIRP's *SaferSanerSchools* Whole School change initiative. The three-tiered program was designed to address preventative and responsive strategies. Tier 1 focuses on school-wide actions and includes use of affective statements, fair process, restorative staff

community, and what is termed “fundamental hypothesis understandings” defined as the “Cornerstone of all restorative practices; necessitates aligning actions with the belief that positive behavioral changes are most likely to occur in a state of high, consistent expectations where authority figures do things with, not for or to others” (p. 8). Restorative approaches that encompass building rapport with families and proactive circles to build trust within a class are considered Tier 2 actions. Tier 3 is the restorative conference reserved for serious infractions. This study thus far has surfaced implementation difficulties including high turnover of trained staff, funding, and teacher resistance. An earlier study of similar tiered implementation of RP, also found a wide range in teacher implementation across classrooms, speculating that this might be due to more traditional teacher beliefs or teachers’ perspective on time constraints in response to evaluative settings (Gregory, et al., 2016).

In a large systematic literature review of 71 studies of school-based RP implementation between 2000 and 2020, Zakszeski and Rutherford (2021) found that many of the studies reported positive outcomes after RP implementation but did not articulate a thorough account of how these positive outcomes came to be. They found limitations in three areas focused on research implementation design. First, there are discordant definitions of RP and approaches were not clearly stated. Second, there was limited support for RP structures and measurements for implementation. Lastly, the few quantitative studies included lacked rigor.

Lodi et al. (2022) reported largely positive outcomes of RP in reducing harsh disciplinary sanctions; improving conflict management; supporting well-being and interpersonal relationships; addressing racial, cultural, gender and socioeconomic disparities; attending to school climate and safety; as well as focusing on academics, absenteeism, and socioemotional skills. However, this review stressed the difficulties schools face in implementation of restorative

practices “as an alternative disciplinary strategy without taking action to eliminate one system over the other,” (p.17) referring to more punitive disciplinary practices.

Lustick (2021) articulates how RP can replicate hegemonic discipline, suspension and exclusionary practices in schools. She defines restorative practices as an alternative to zero tolerance measures designed instead to center reparations for harm rather than punishment of offenders. She notes RP implementation continues to focus on changing the behavior of students rather than focusing on educators’ beliefs and practices that maintain inequitable power dynamics. Her work addresses this gap through the conceptual lens of the Gramscian notion of hegemony. This conceptual framework views transformation to be at an individual level but argues for hegemonic shift to be sustainable it must occur on an institutional level. Lustick highlights that despite best efforts to counter the racism in our educational structure the problem remains. She points out the limited research on the discipline gap between white students and students of Color, even in restorative settings and makes a call to the field for “a model of culturally responsive restorative practices that allows for adult staff transformation as well as the healing of interpersonal harms” (p. 1292).

*The Role of RP in **Reproducing Inequity***

Historically, the zero tolerance reactions to student behavior stemming from the U.S. Gun-Free School Zones Act of 1996 led to a rise in school suspensions and expulsions for non-safety-threatening behaviors that are ordinary student transgressions (Gregory & Evans, 2020), such as failing to tuck in a shirt or being late for class (Mowen, 2017). Exclusionary discipline that grew out of zero tolerance policies set the stage for racial and ethnic disciplinary disparities (Skiba et al., 2014). These punitive policies disproportionately affect Black, Brown, and Indigenous students (Mansfield, et. al, 2018a). In the school context, there is, in fact, no data

that supports the idea that Black students misbehave more frequently than their White counterparts (Mansfield, et. al, 2018a). Exclusionary practices and extreme disciplinary policies associated with a greater population of students of Color is theorized by Payne and Welch (2015) as racial threat, in which there is a proportional relationship between Blacks in a community and public punitiveness to mitigate perceived social threats by the White majority. The effects of exclusionary school discipline have been shown to contribute to the school-to-prison pipeline, a term coined to denote the relatedness between school disciplinary practices and future juvenile justice entanglements (Skiba, et al., 2014). Mansfield et. al (2018a) note that the phrasing "school-to-prison pipeline", now ubiquitous in the literature, suggests that the relationship between school discipline and the juvenile justice system is causal rather than correlational. The ramifications of the zero-tolerance approach for students of Color is associated with reduced involvement in extracurricular activities, increased feelings of frustration and anger, and an increased likelihood of being involved in the juvenile justice system (Mowen, 2017). However, RP implementation not only fails to address these inequities but reproduces them when the aim continues to be changing students rather than the system (Basile, 2020; Lustick, 2021).

Gregory & Evans (2020) compiled a report for the National Education Policy Center reviewing the status of RJE initiatives, the research on RJE and RP, and made further recommendations. After a summary of some of the research they suggest mis-implementation models might account for why RP continues to reinforce the status quo noting that a recent survey in which 20% of the teacher respondents did not think RJE disciplinary approaches were effective, indicating administrators lack support with student behavior and lack of accountability for the students. The mis-implementation models described were a top-down mandated model, a narrow model, a color-blind/power-blind model, a train and hope model, and short-term model.

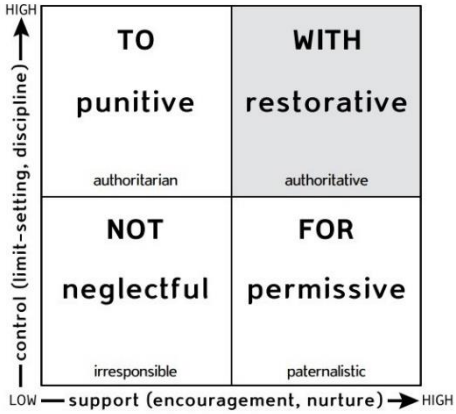
While relatively self-explanatory, they noted that the top-down mandated model is less likely to get teacher buy-in. The narrow model loosely implemented initiatives in which the importance of full community participation was not stressed. The color-blind/power-blind model neglects to emphasize the social-justice orientation of restorative practices, focusing too often on individuals and not on the systemic racism that is foundational to American education. The train and hope model refers to the one-and-done professional development that lacks follow up. The final model speaks to initiatives that did not have the resources in place for long term implementation. They recommended schools "adopt principle-based, comprehensive and equity-oriented RJE" (p.4). The principles reflect the fundamentals of RJE valuing the worth of each individual in a community with dignity and respect through a social-justice oriented lens. This recommendation moves beyond the focus on student behaviors to include policies, pedagogical directions, adult behaviors, and school-wide decision-making structures. This recommendation reinforces the equity lens of RJE addressing the racialized disciplinary practices noting the "reduction in suspensions and expulsions will not address the systemic and structural inequalities that impact students' social, emotional, and academic well-being" (p.4). Further recommendations for schools speak to implementation strategies. The authors highlight the importance of taking context into account and "engage fully supportive allies while honoring slow adopters, whose critiques and questions can help chart directions" (p.5).

Shifts in the Field

Returning to the confusion in readily defining RP, I believe at the core of the problem is wrangling with clarity on the actions of a restorative community, the intention behind the actions and how intentions are communicated. This is evidenced by the utilization of the "Social Discipline Window" in the *Restorative Practices Handbook* (Costello et al., 2018, p. 50) as a

tool to illustrate levels of support in engaging with and reinforcing social norms. The window (Figure 3) represents four modes of interaction in discipline to serve as an antidote to a simplistic model of punitive to permissive. Rather than a continuum, the Social Discipline Window illustrates low to high supports on an x axis which involve encouragement and nurturing, in relation to low to high control on the y axis, which include limit-setting and discipline. They explain the window in this way:

Figure 3. The Social Discipline Window



> By engaging with young people, we can hold them accountable in an active way. Then we are doing things WITH them. But when we simply hand out punishments, we are doing things TO them. Or when we take care of their problems and make no demands, we are doing things FOR them. And when we ignore their behavior, we are NOT doing anything (Costello et al., 2018, p. 51).

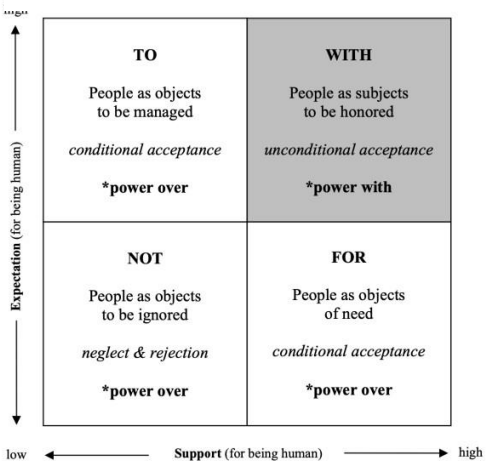
Although the first chapter of the book is dedicated to proactive use of circles, the language used here approaches restorative work as a disciplinary tool that is reactive. The very notion that students must be controlled runs contrary to the idea of restorative. The language itself is punitive.

Vaandering (2013) makes this case and presents another way of understanding the matrix, retitling it "The Relationship Window". In this version support is still on the x axis, but support is described as support for "being human" (p.327). While the word *expectations* replace *control* on the y axis. The Relationship Window (Figure 4) reevaluates how students are engaged

with shifting the student from object to subject. The humanizing way this reworked model can be used is described by one school:

> At our best we will 'support' each other and 'expect' each other to be all that we can be. When we do this we live WITH each other as human beings. If we only support each other but don't expect each other to be human, then we treat one another like a stuffed toy - an object that we do things FOR so we feel good about ourselves. If we expect lots from each other but don't support each other, then we turn each other into machines and do things TO another so that we get what we want. If we don't support or expect anything from each other, we ignore each other and treat each other like dirt - as if they don't exist so we do NOT have to care for them.

Figure 4. The Relationship Window



Vaandering highlights the use of behavior-oriented language in the Social Discipline Window as problematic, pointing out that it "reinforces justice as 'right-order' thinking" (p.321). From this vantage point, RP is an equitable disciplinary practice that seeks to "legitimize teacher and administrator authority" (Gregory et al., 2016, p. 330) by amplifying student voice, fortifying student-teacher connections, and maintaining social structure. Yet, the fact that administrators and teachers feel compelled to maintain authority speaks to an inequitable power struggle. Language of control, limit-setting and focus on student behavior fortifies a hegemonic culture (Vaandering, 2013).

Shifting from social control to social engagement is crucial to enacting RP (Payne & Welch, 2015). However, moving away from a culture of surveillance and exclusion to one of trust and inclusion requires schools and practitioners to reflect on the way in which RP is engaged in their setting. For instance, it is prudent to consider how language is used and to discontinue the use of language that reflects power dynamics. Such dynamics maintain a power structure in which the adults control the space. The teacher in this scenario, instead of sharing the space with students as a participant in the learning community, controls the space. Words like *discipline* and *control* do not embrace community building or the suppositions of RJE. Basile (2020) in describing decriminalizing practices for boys of Color includes what he calls positive reframing "using language and actions to change negative occurrences or moments with expected punishments into positive ones" (p.234). As RP gained traction McClusky et al. (2008) concluded that the promise of RP is dependent on the degree to which schools are able to engage with the shared vision and values that undergird the initiative. The research raised questions about "whether restorative practices might just still be about compliance, another surveillance technique to add to the Foucauldian panopticon" (McClusky, et al., 2008, p.415). I believe that a reframing of restorative practices at a paradigmatic level requires a shift in how we conceive of RP. That is, not only does the field need to come to consensus about how RP is defined, but also how we engage with it, enact it and the language we use around it. In other words, the RP Discourses within the RJE community need refining to foster RP in localized contexts.

The Restorative Practices Handbook (Costello et al., 2018) points out that there is "a widely held mistaken belief that the concept of restorative practices is merely a discipline approach. While teachers have found these concepts and practices helpful in managing their classrooms, the whole notion of actively engaging students and allowing them to take greater

responsibility enhances the quality of teaching and learning in general" (p. 8). Missing from the handbook are practical means of building community. In the first chapter, they describe a "range of restorative responses" (p.12), again implying a reaction. In this chapter, they share a "Restorative Practices Continuum" (p. 12) that begins in an informal space with affective statements through to the formal space of conferencing, yet beyond saying affirmative and kind things to students, no other advice is given for proactive steps in the classroom. The onus is on students to change their behavior as opposed to teachers designing for learning as community.

RP as a Possibility for Disrupting Systemic Racism in Schools

Caught in traditional approaches to classroom management, teachers fall back on exclusionary and surveillance strategies. When implemented thoughtfully and intentionally as the activity of building a community of learners, RP presents the opportunity for school to become a shared collaborative space, one in which students and staff can thrive. Through relationship building endeavors, the door to other ways of being together in the classroom opens for teachers and students. Basile (2021) notes RP remains "situated within a system that supports teacher beliefs and teaching practices that criminalize boys of Color. At the heart of this issue is the persistent ethos of fixing the students, instead of fixing the system" (p. 230). To properly address the difficulties in implementing RP, equity needs to be placed "front and center" in teacher education (Nieto, 2000). The recommendations made by the National Education Policy Center (2020) note that singular efforts into reducing suspension and expulsion are not enough to push back on systemic and structural inequalities in education. Also necessary is an emphasis on equity and focus on the social-emotional and academic needs of students. Nieto (2000) suggests strategies in teacher learning to tackle the challenge. When educators embrace teaching as a lifelong "journey of transformation" (p. 184) they explore their own identities, discover their

students' actualities, build consequential relationships with their students, invest in students being multilingual and multicultural, confront racism, and foster a community of practice. Uneven implementation of RP is problematic, not just for students, but teachers as well. RP in service of RJE becomes engaged pedagogy, a "classroom that employs a holistic model of learning [that] will also be a place where teachers grow, and are empowered by the process" (hooks, 2014, p. 21).

The Relationship of Teachers' Professional Identity, Attitudes, and Beliefs

> If teacher education is to matter to teachers, to the university, and to those who learn the work of teaching, our responsibility is to its conditions: learning to live in this time that is out of joint, in discontinuous time, and in disjuncture of self/other relations. (Britzman, p. 44, 2009).

As she begins a philosophical exploration about teaching as an impossible profession, Deborah Britzman reflects on the complication of history-in-practice that teachers carry with them as both educator and learner. The entanglement of the two aspects of a teacher is closely tied to teacher identity, beliefs, attitudes and what the educational field means by *practice*. The way a teacher conceives of their role and the role of the student is shaped by their beliefs and assumptions, fomented by action in and interaction with the world. Conceptual change manifests from the interchange between practice, professional and social contexts (Keiny, 1994).

This work was designed with the understanding that collective activity is relational and as such informed by participating individuals' historicity while recognizing the role institutional struggle plays in the identity and development of both the individual and the collective entity, each shaping and reshaping through interaction. Social Practice Theory connects identity to attitudes and beliefs. Through this lens "one's identities, once they become entrenched in history-in-person, provide a ground for agency both in guiding one's behavior in cultural

activities and in avoiding behaviors that are not compatible with self-assigned identity" (Holland & Lave, 2009, p.8). Reviewing research on the relationship between teacher beliefs, emotions and identity formation, Zembylas and Chubbuck (2014) reported three themes in recent literature: 1) teachers' histories, beliefs, and the sociopolitical context of their working environment were closely associated with the emotions felt during their evolving professional identity development; 2) particularly in the context of school reform, teacher emotion played a significant role in their personal and professional identities; 3) "emotions, beliefs, and teacher identity are conceptually defined as interrelated and dynamic…" (p.179). In communities of practice, the degree to which participation occurs is informed by the level of engagement on the part of the individual. The opportunities for the individual to further the practices of community that they find worthwhile and the experience of being valued by the community contribute to favorable conditions for learning (Wenger, 1998). Learning in this way, "transforms our identities: it transforms our ability to participate in the world by changing all at once who we are, our practices, and our communities" (Wenger, 1998, p. 227).

Teacher Professional Identity

Parallels exist between practice and identity (Wenger, 1998). Both are contingent on recalibration of meaning making in the context of: participation and reification, membership, learning, connected and/or overlapping groups, and situated belonging (Wenger, 1998). Mockler's (2011) conceptualization of professional teacher identity speaks to identity formed in the nexus of education, shaped internally and externally as narrations of the teacher's lived experience. Identity is not static. It is fluid, multifaceted and dynamic. By storying and restorying, teachers both own and construct their professional identities over a career. This means that as a function of imagination, a mode of belonging, in and across communities; stories

of experiences, histories, understandings and engagements; local and global, are negotiated with/through self and others (Wenger, 1998). Rather than linear, Mockler (2011) presents a model for teacher professional identity that suggests intersection through interaction. As teachers spend more time in the community of practice, doing the work of the community, negotiating through mutual engagement, defining, and refining repertoires of practice and developing a sense of responsibility for the work of the collective, a sense of competence begins to emerge (Wenger, 1998). The interchange between competence and meaningful experience are elements of learning, while not necessarily determinants of each other, the interplay between the two legitimize membership in a community of practice (Wenger, 1998). Possibility for change occurs through improvisations, "the sort of impromptu actions that occur when our past, brought to the present as *habitus*, meets with a particular combination of circumstances and conditions for which we have no set response" (Holland et al., 2001, p. 17). By engaging in improvisations afforded by the interplay between meaningful experiences, growing knowledge in and through community and an increased sense of competence, an individual has a growing perception of becoming part of the community of practice (Lave & Wenger, 2001). A sense of belonging is introduced. This authoring of self, the *I*, is the locus of meaning making in the individual (Holland et al., 2001). Self in relation to *other*, in part clarifies identity (Mockler, 2011). Professional identity is shaped by an individual's perception and positioning of themselves (Mockler, 2011). A teachers' professional identity is ever emerging. Identity in practice, shaped by participation in and influence on the collective *we* centers and leaves open the opportunity for *I* to continue to shift (Wenger, 1998).

Teacher Attitudes and Beliefs

Attitude and beliefs impact the way teachers integrate new information. Separating out attitudes from beliefs in the literature is vague (Richardson, 1996). I operationalize attitudes as predispositions, influenced by feelings and emotions (Richardson, 1996). Beliefs, in this work, are viewed as an understanding held by an individual that they hold to be true. The development of pedagogical attitudes in educators occurs in three stages: formation, adjustment, and alignment, although not necessarily sequentially (Hunzicker, 2013). Generally, formation occurs as a pre-service teacher embarks on the journey of developing their professional identity. Attitude adjustments are made as a teacher engages in the work of being an educator. Attitude alignment evolves as a seasoned teacher pursues professional learning and reflection leading to a harmonizing of pedagogical perspectives with supporting behaviors and values (Hunzicker, 2013). James Noonan (2018) described beliefs as a "durable but permeable filter through which people saw the world. In this sense, they reflected and refracted teachers' identities" (p. 2). Beliefs are cognitive constructs that involve assumptions an individual holds to be true, drive decision making, actions, and are shaped by affect embodied in attitudes (Bryan, 2003).

Teachers view their professional success in the context of their students' behaviors and engagements (Guskey, 2002). Students' behavior and engagements may be understood as the way students interact with each other and/or with a task. For instance, does the child contribute to class discussions or hold back? Does the student use available tools and strategies for problem solving? Are lessons completed or left partially or completely unexplored? Effective professional learning that leads to a change in teachers' attitudes and beliefs is practical and relates directly to classroom activities (Guskey, 2002). Additionally, changes in teachers' attitudes and beliefs occur after they implement some of the new instructional strategies and begin to see

improvement in student outcomes (Guskey, 2002). Professional learning seeking change needs to make teachers' attitudes and beliefs visible to themselves (Noonan, 2018). In a review of change studies on the role of teacher beliefs and shifts in practice, Richardson (1996) synthesized six characteristics of successful professional learning: 1) teacher beliefs and attitudes are centered 2) focus is on facilitation of discussion to aid teachers in reflecting on the relationship between their beliefs and practices 3) discussions include ethical and moral considerations 4) participating teachers are in control of the agenda, process and content 5) the role of expert is a shared between participating teachers and facilitator 6) the professional learning is long-term and takes into account the unevenness of teacher change.

The Role of Race in Teacher Learning

In a review of the last 20 years of professional development, Howard and Navarro (2016) expanded on what scholars have learned about Critical Race Theory (CRT) as a theoretical framework and made recommendations for moving forward. They point out that, while we now know being explicit about race, racism and the impact on educational opportunities is important, researchers and practitioners continue to grapple with translating the tenets of CRT into tangible equity oriented educational tools. Nurturing racial consciousness in teachers, classrooms and content is necessary, but teaching it "requires a deep level of analysis, self-reflection, and understanding of racial realities both past and current" (Howard & Navarro, 2016, p.9). Ladson-Billings (1995) addressed conceptions of self and others shared by the exemplary teachers of African American students. She found they had high expectations of their students and viewed them as academically capable; "saw their pedagogy as art-unpredictable, always in the process of becoming" (p.478), considered themselves members of the community and their teaching role as a means of giving back, and viewed students holding knowledge. Basile (2020) suggested that

decriminalizing practices for boys of Color fall into six categories: “structural and procedural, honoring space, assuming brilliance, highly respectful interactions, positive reframing, and repair” (p.234). Structural and procedural decriminalizing practices adjust rules and the physical space to embody realistic expectations. Honoring space recognizes that our young students have only been on the planet a few short years and there will be moments where acts of resistance occur. Providing a nondisruptive space/place to work through the upset has positive outcomes. Assuming brilliance is more than high expectations, assuming brilliance seeks ways for brilliance to shine. Language, tone, and an ethic of care characterize highly respectful interactions. Positive reframing is viewing acts of resistance from another angle. Designing learning opportunities for teachers to develop these types of practices that are antithetical to the larger educational system presents a conundrum. To design for teacher learning the experience “must generate social energy at the same time it seeks to direct this energy. It must set up a framework, but it depends on this framework being negotiable in practice” (Wenger, 1998, p. 235).

This research focused on how to design a space/place for teacher *becoming* in and through personal and collective transformation, a Gutiérrez and Vossoughi (2010) inspired social design experiment, in which “the term experiment is reclaimed and reframed as open and creative, in ways that create space to experiment pedagogically, to design collective collaborative spaces that heighten the potential for deep learning to occur and for the development of powerful literacies that facilitate social change” (p.102). An inquiry approach to professional learning brings with it the possibility for transformation (Mockler & Groundwater, 2015). Designing for teacher learning centered on the integration of STEM and literacy harnessed the possibility to

"create fields of identification and negotiability that orient the practices and identities of those involved to various forms of participation and non-participation" (Wenger, 1998, p.235).

Addressing Social Justice in Education through Science and Literacy Integration

Authenticity in Science and Literacy

Science is recognized as a social practice (Michaels et al., 2008) and as such it is entangled with literacy. The work of scientists necessarily involves reading, writing, speaking, and listening, the four areas of literacy Common Core Language Arts Standards address. Scientists engage in eight core disciplinary practices all of which require some combination if not the use of all four literacy skills: asking questions; developing and using models; planning and executing investigations; analyzing and interpreting data; using mathematics and computational thinking; constructing scientific explanations and engineering solutions; using evidence to support disciplinary arguments; and collecting, evaluating, and disseminating information (NRC, 2012). Instructional practices that encourage engagement in science classrooms include access to resources, choice, tasks that are meaningful to students, space for individual and collective sense-making, and an opportunity for agency (NRC, 2007).

Therefore, authentic science experiences for students necessarily involve literacy skills. Historically, science classes were often textbook centered. Students would read a book or passage, the teacher explained the science and the hands-on component occurred as a separate experience (Barber & Cervetti, 2010). Design of authentic science experiences for students employs scientific practices. Conversely, authentic purpose for literacy instruction views the experience as a means of communication of information and an exchange of ideas (Duke et al., 2006). Three principles are posited by Cervetti (Barber & Cervetti, 2019) to recalibrate the relationship between literacy and science in the classroom: 1) student inquiry has scientific

purpose; 2) the integrated hands-on science and literacy reinforces science understanding; 3) students have the opportunity to read, write and talk about texts in science. These ways of intentionally leveraging science inquiry with genuine practice of literacy skills becomes a space of meaning making as students work to figure out a phenomenon (Pearson et al., 2010).

Building a Learning Community Through Science and Literacy Integration

Productive participation in science in the elementary classroom is affected by motivation, attitude, and identity (NRC, 2007). Not only do students need to believe they can do science, but they also need intrinsic motivation and interest to do science through support of autonomy, a sense of competence, established learning goals, and meaningful opportunities for inquiry (NRC, 2007). Drawing again on Wenger's communities of practice and contemplating learning as part of a community, the intersection of science and literacy becomes a rich context for building a community of learners, much in the same way the adult community of practice takes shape.

Building a community of learners in an integrated STEM/literacy context that appreciates the principles laid out by Cervetti (Barber & Cervetti, 2019) and keeping equity "front and center" (Nieto, 2000) leverages students' funds of knowledge (Gonzalez, et al., 1995) and embraces culturally relevant pedagogy is characterized in part by being collaborative, reflective, and responsive (Cobb et al., 2003). Using students' funds of knowledge requires teachers to identify and strategically utilize the ample resources students glean from their cultural communities (Gonzalez, et al., 1995) while remaining sensitive to the evolving and emergent nature of these community and heritage practices (Paris & Alim, 2015). Science classrooms in which productive discourse is part of the culture shift the educational experience of the student from a Freirean notion of a "banking method" to one that is democratized (Shor, 1993). The banking method views students as repositories for knowledge instead of capable participants in

collective and individual knowledge construction. In this scenario the teacher is the sole expert. Conversely, teachers who take up the mantle of *transformative intellectuals* (Giroux & McLaren, 1986) through intentional orchestration of student discourse view their students as critical stakeholders in the learning community possessing knowledge that holds the possibility for change. Interwoven with the idea of talk is listening (Gee, 2015). I use the phrase intentional orchestration because the teacher in such discursive spaces must listen carefully, recognizing how their attitudes and beliefs shade perception and inform instructional direction for both individual student learning and facilitation of group interactions (Delpit, 1988). Such receptive listening bolsters students intellectually and emotionally (Noddings, 2012).

Emotional support requires students to have a sense of control within their community (Ginwright, 2015). The productive disciplinary engagement framework introduced by Engle (2012) positions students to problematize information and already held understandings, take up authority for their new ideas, hold themselves accountable to their ideas with evidence, and access resources through constructive science talks. Engaging students in this form of discourse builds a sense of competence stemming from ownership of the meaning of ideas (Wenger, 1998). Such agential positioning brings with it opportunities for the students to author their stories (Ellsworth, 1989). A sense of belonging and feeling of competence opens up the prospect for student perception of self to shift (Holland, et. al., 2001).

Discussion norms make science learning more accessible, fostering collective agency (Cazden, 1988; Lemke, 1990). Delpit (1988) speaks about discussion norms as a means of power while Apple (1971) points to making rules of engagement visible to everybody. Understanding how the learning community engages in discussion and how to participate in disciplinary specific (D)iscourse creates a space/place for the conversation to be accessible to all students (Lemke,

1990). Through discussion norms members of the community have space to actively participate in the work of the community, by making explicit discursive roles and responsibilities in the community of practice (Cazden, 1988). Engagement, negotiated norms and other joint endeavors, and shared repertoires of practice are, for students as with adults, necessary conditions for the opportunity to arise to push beyond membership and fully participate in the community, opening the door for a stronger sense of belonging that will in turn nurture the possibility for canonical identity work of the members (Wenger, 1998).

Addressing Social Justice Issues Through Student Talk

Recent reform in science education views student engagement in the core scientific practices as an equitable endeavor (NRC, 2012). Intentional science instruction designed with equity in mind makes materials, time, and guidance for participation in science and engineering practices accessible to all students by building on their existing knowledge, elevating cultural ways of knowing about what it means to do science, connecting their interests and nurturing their sense of wonder in the natural world (NRC, 2012). Cochran-Smith et al. (2016) identify several patterns of practice, things teachers do and design curricula for, including inquiry and transdisciplinary instruction. They identified six facets to be considered in patterns of practice that center equity and support student autonomy. These include content that is meaningful to students and relevant to their embodied experiences, student-centered learning environments that are intentionally designed to be respectful and supportive, responsive teaching, and an inquiry approach to teaching. Sias et al. (2017) identified student-centered learning, place-based learning (PBL), project-based learning, family involvement, inquiry, development of core STEM practices and 21st century skills as learning spaces of educational innovation, noting the role of instructional technology and curriculum integration as mechanisms for innovative instruction.

All of these educational innovations recognize and plan for what we see as autonomy-supportive teacher patterns of practice that facilitate and foster students' knowledge construction, are student-centered and attend to the ideas, perspectives and feelings of their students.

As a teacher experiences pedagogical shifts in their instruction, the possibility for a shared space with students surfaces. The potential for transformation on multiple levels arises for both the students and teachers as learners. Opportunity for identity transformation becomes possible as a function of the learning that occurs in both the individual and the communities of practice (Wenger, 1998), making possible a more critical pedagogical approach to designing for student learning, characterized by being: participatory, situated, critical, democratic, dialogic, multicultural and moves students from participating peripherally to actively (Shor, 1993). This pedagogy integrates affective, intellectual and critical pedagogical concerns becoming a space that accounts for the "broadest development of human feeling as well as the development of social inquiry and conceptual habits of mind" (Shor, 1993, p. 33). Science spaces nurtured through productive discourse are learning communities that amplify all student voices, bridge student ideas to scientific concepts and provide opportunities for students to extend and revise their thinking (Engle & Conant, 2002). Additionally, they become places/spaces for engaged pedagogy (hooks, 1994), a site for teachers to learn alongside their students.

CHAPTER III: METHODOLOGY AND METHODS

Methodology and Methods

Gutiérrez et al., (2016) speak to the relationship between theory and methods in participatory design research, noting the iterative nature of this kind of work and the importance of theory building. The authors challenge researchers to generate theories that in themselves provide conceptual frameworks to elucidate the data. In turn, this practice fine tunes the theory being utilized. From a PDR lens, thinking of settings and contexts as theoretical constructs brings to light how collective activity is uniquely informed by time/space/place. Methodology, the authors argue, is the way forms of data analysis and theory are tied together. Therefore, the methodological directions that are employed in PDR necessarily are shaped in collaboration with the participants and in response to the study as it unfolds.

In introducing the theoretical frameworks, I explained that the armature of this study is the synthesis of both CRT and SPT. This approach sought to investigate the complexity of our racialized educational system by attending to the "tension, conflict and difference in participation in cultural activities" (Holland & Lave, 2009, p.13) in the research setting utilizing a transformational methodological stance through participatory design.

Methodology

Participatory Design Research

The terms participatory research, action research and community-based participatory research have been used interchangeably in reference to community-based research (Baidee, Wang & Creswell, 2012). These approaches stress the equitable collaboration between researchers and the community in pursuit of a relevant community interest. Affordances of

mixed methods in community-based research include an increase in community control throughout the research project by recalibrating the power dynamic between researcher and community members, reducing survey errors, and fortifying evidence (Baidee, et al., 2012).

Participatory Design Research (PDR) is a methodology that seeks to add to the body of knowledge about learning sciences through contextualized interventions that provide generalizable insight (Bang & Vossoughi, 2016). Additionally, PDR draws on participatory and collaborative action research, youth participatory action research and decolonizing methodologies, to disrupt traditional power structures between the researcher and the research focus through attention to how "(a) critical historicity, (b) power, and (c) relational dynamics share processes of partnering and the possible forms of learning that emerge in and through them" (Bang & Vossoughi, 2016, p. 175). Transformational agency can be distinguished from traditional forms of agency in that it is rooted in exploration of dissonance within and as part of group endeavors from which fresh imaginings may bloom, moving past the individual to collectively undertake change (Bang & Vossoughi, 2016.) Gutiérrez and Vossoughi (2010) examine social design experiments as a change laboratory. The project itself becomes the object of inquiry. This necessitates cognizance of how the intervention is impacting the community at each stage in order to be responsive to community needs and inform next steps in the project. Like the Change Laboratory model inspired by Yrjö Engström's activity-theory work, in the social design experiment the researcher "becomes part of the toolkit utilized by participants and helps to design artifact-rich activity settings that mediate the development of new practices for reflection, debate, and transformative learning" (p. 104).

Creswell & Plano Clark (2017) outline the four levels of developing a mixed methods research study. To begin, the researcher starts with their own epistemology, ontology and

axiology, their paradigm worldview. This informs the direction the theoretical framework takes, which in turn helps the researcher to make decisions first about methodology and then methods (Creswell & Plano Clark, 2017).

Mertens (2012) reflects on three paradigmatic stances that undergird mixed methods research: dialectical pluralism, pragmatic and transformative. The dialectic view is an exchange between the quantitative data supported by post positivist views and the constructivist orientation in the qualitative data. It should be noted that Creswell & Plano Clark (2017) describe these as two separate paradigms in conversation with one another. The pragmatic paradigm is a stance in which the methods are tailored to the research questions. Mertens (2012) points out that this is somewhat of an oversimplification, noting that "different knowledge claims result from different ways of engaging with the social world" (p.256). The transformative paradigm utilizes mixed methods as a mechanism for social change.

A transformative paradigm can be viewed as an axiological, ontological, epistemological, and methodological lens (Mertens, 2010). The transformative paradigm from the axiological view is that the work should bolster and extend social justice change, human rights advances, and regard for cultural norms. Numerous narrations of reality and realities as social constructs characterize the underlying ontological assumption of the transformative paradigm. The epistemological stance interrogates our interpretations of reality and how our attitudes and beliefs are reflected in the research.

Thus, these viewpoints inform my methodological decisions. My decision to engage in a PDR study was consistent with a transformative paradigm and as such fit with my axiological understanding that throughout the study, I be vigilant about myself in relation to the BWES community, the CoLab members and the data collected. This required a high level of reflexivity,

continually checking and noticing where my efforts as a researcher rippled through the community that I was both part of and apart from. I did through the structures of the CoLab meetings in which I sought feedback from members about how I was operationalizing terms, data that was emerging and how I was understanding and interpreting the data. Ontologically, this paradigm requires the researcher to maintain sight of truth as a social construct in which multiple narrations are possible. Remaining aware of how my ontology and epistemology framed the way I viewed the data necessitated being "methodologically self-conscious [which] means that the qualitative data analyst should be aware that their particular perspective is likely to influence their choice of coding method-but, in qualitative analysis, this is not generally thought to be a bias that needs to be 'corrected' rather it is seen to be beneficial that the analyst is able to use their own unique skills, talent and expertise" (Blair, 2015, p.15).

Methods

Mixed Methods Design

While sometimes conflated, in mixed methods there is a distinction between methodology and methods. While methodology incorporates philosophical assumptions, methods are the specific techniques employed. (Creswell & Plano Clark, 2017). The decision to conduct this research through mixed methods was made to elicit wider participation in the project and to ensure recurring opportunities for all the educators at Beechwood Elementary to exercise their voice. This study was a complex mixed methods design using a convergent core (Appendix G). Data collection of both the quantitative data and qualitative data was gathered simultaneously. The point of integration occurred after the independent analysis of each type of data.

The transformational aspirations and sensitivity to the context necessitated the use of a complex participatory social-justice design. A key characteristic of such a design is that the

participatory social-justice stance is evident at each phase of the project. In this research stakeholders from the school community were involved in the conceptualization of the project, including identification of the localized opportunity space; and the inception and evolution of the emergent community of practice that became both the object and product of the study. The qualitative data tools and data collection were both artifacts of the community of practice and the results of the research.

Participants in This Study

Campano et al. (2015) laid out four considerations, questions to ask myself, to design for research partnerships with teachers: 1) Whose problem is it anyway? 2) What does it mean to gain access? 3) How (and where) do relationships matter? 4) How do I navigate the evolving parameters of research? I began building relationships at the school four years ago and I have known some members of the community even longer from other settings. The work of identifying a community need as the focus of this research arose organically and over time. Conversations and shared experiences over the years with stakeholders including teachers, leadership, and university liaisons, helped surface the need to think about how restorative practices were taken up at Beechwood. First, I approached the university liaison and the principal of the school with my idea to leverage the natural community building that occurs when literacy and STEM are integrated. It was important to the project that the leadership team be part of the complete process. The principal was fiercely protective of the teachers' time and how they were perceived. For this reason, the administration constituted the research team.

The design and dreaming collaborators, however, were the teachers. They were not included on the research team per se, because of CITI training requirements. Ms. Rayne, a seasoned K-2 teacher, was asked to work on the pilot study with me because of our longstanding

professional relationship and subsequent friendship that has formed over the years. The pilot took place in the spring of 2022. The following school year, 2022 - 2023, her grade level team asked to join our work. Ms. Juarez was a beginning teacher in the first three years of her career and Ms. Noble was a veteran teacher whom I have worked with since being at Beechwood.

Also, part of the initial collaboration and the impetus for the development of the community of practice that emerged, were three 3-5 grade teachers from BWES. Ms. Judd, Ms. Simon and Ms. Allen were all seasoned teachers, While Ms. Simon was new to the school in the second half of 2022, Ms. Judd and Ms. Allen had taught at the school for most of the partnership with the university. Ms. Allen was a longtime colleague of mine through the University STEM Teacher Network.

The STEM Teaching and Learning CoLaboratory and the Dreaming Team

Over the summer of 2022, Ms. Judd, Ms. Simon, and Ms. Allen attended the University STEM Teacher Network Advanced Summer Institute that I co-designed and ran. The Summer Institute focused on designing integrated phenomena driven science/literacy mini storylines. Also present at this Summer Institute was Ms. Anderson, a longtime member of the University STEM Teacher Network and an elementary teacher from a nearby school within the same county as Beechwood. As a result of the collaborative STEM activities and rich dialogue over the two-day intensive, the teachers wondered why we were not doing this sort of thing at BWES on a regular basis. This musing marked the conception of the BWES STEM Teaching and Learning CoLaboratory (the CoLab). A collaboratory is "specifically designed to enable a diverse range of stakeholders to address a burning societal issue" (Smith et al., 2022), in our case the focus became developing and implementing equitable learning communities through STEM and literacy integration. The evolution of the CoLab as a STEM educator community of practice

became the object and product of this research which explored restorative practices through the integration of STEM and literacy. As such, the progression of the CoLab as a community of practice, membership, and participation in the CoLab and the community's subjectivity to the historical and current activities of constellations of communities that brushed up and flowed into the CoLab, (re)shaped the nature of participation in and joint enterprise of the CoLab (Appendix A).

Portraits of the CoLab Members

Ms. Rayne. Ms. Rayne wore a pendant of a hummingbird around her neck every day. It was a representation of the classroom community she nurtured each school year. Smiling broadly, Ms. Rayne could be heard often reminding her students how Hummingbirds, as she referred to them, are together as a community. Ms. Rayne, an African American woman, was born and raised near BWES. In her early academic career Ms. Rayne focused on Sociology and African American studies. After completing her bachelor's degree, she joined Teach for America and relocated to another state. She laughed as she described how her teacher training amounted to only five weeks of what she called "teacher bootcamp". After five years she returned home and taught K-2 for another decade. She had been at BWES for the duration of the partnership with the county, earning a Master's in Literacy Education along the way. It was during a summer class she was taking that we first encountered each other at the university. I was the instructor at the university writing camp, and she was assigned to work with the K-2 students as part of a class. The following school year I began my work with BWES. We have been close working partners and friends ever since. The idea for this project bubbled up from the many conversations she and I had about STEM and equity.

Dr. Jenkins. Dr. Jenkins, an African American man, had been part of the BWES leadership team for two years when we began the pilot study in the spring of 2022/2023. Popular with students and teachers alike, Dr. Jenkins filled the role at BWES of RP mediator and model. His familiarity with RP started prior to his appointment at BWES at a nearby high school. Along with taking up the baton in leading RP professional learning at BWES, he had also brought with him a Socio Emotional Learning (SEL) initiative. Dr. Jenkins was invaluable as a thinking partner through this process. He was always willing to have the hard conversations about race and the nature of the racialized school system while being reflective and thoughtful about how the different constellations teachers move in and out of and their intersectionality shape their instruction.

Ms. Allen. Ms. Allen identified as a Filipina American. She had an endlessly positive and supportive way of being, both with her students and her colleagues, easy to talk to and happy to listen. A seasoned educator of 24 years, she pursued professional learning and teacher leadership opportunities her entire career. At various points, she worked with the county as a teacher leader and as part of a mentor program. Ms. Allen and I discovered a simpatico approach to teaching when we met in 2015 at a professional development on instruction of elementary engineering for teachers. In the intervening years our paths crossed regularly as we participated in the University STEM Teacher Network, as learners and teacher leaders, and then when I began my work at BWES. Ms. Allen taught grades 2-4 at BWES for most of the duration of the university and county partnership. At the beginning of the school year in which this study was conducted she had just begun a doctoral program in education at the partnering institution.

Ms. Judd. Ms. Judd, a White woman, began her teaching career thirty years ago in the middle grades. Her bachelor's degree was in English Language Arts Education. After having her

own children, she became interested in early literacy and went Back-to-School for a master's in literacy. She became certified as a reading specialist and elementary teacher. Ms. Judd began at BWES the same year I did. Departmentalized in the older grades, she had been charged over the years with teaching both literacy and science. Despite being departmentalized, Ms. Judd was a master at integrating the content areas, partnering exploratory science with literature and productive talk across her teaching blocks. She used the time at BWES to earn an Ed.D. with the partnering university hoping to shift into teacher education.

Ms. Simon. Ms. Simon, who identifies as Black woman, was born and raised on a colonized Caribbean Island was educated under a British system through the age of twelve when her family moved to the United States. A seasoned teacher of over twenty years, she had her first career in the Air Force. Ms. Simon was new to the school after winter break in 2022. She was departmentalized at the same grade level as Ms. Judd teaching science and math. After Ms. Judd registered for the Advanced Summer Institute with the University STEM Teacher Network, Ms. Simon asked if she could be included, although she had not attended any other Summer Institutes with the Network. Ms. Simon, like the other teachers that were part of this study, highly valued professional learning that she felt would make her a better teacher. The idea of the CoLab came from her. Ms. Simon reflected a deep care for her students, taking a special interest in how nutrition and exercise impacted student learning. Ms. Simon left BWES as we departed for the Winter break after the dissolution of the district and university partnership was announced.

Ms. Anderson. Ms. Anderson, who is a White teacher, had a big energy and an enthusiasm for her job that was contagious. She was a regular member of the University STEM Teacher Network in the capacity of both learner and teacher leader, which is where my relationship with her developed. Ms. Anderson taught at the other elementary school in the

county. Over the years at various points through the Network, BWES teachers had tried to cajole Ms. Anderson to move to BWES. Ms. Anderson had been departmentalized as the science teacher for 5th grade for multiple school years. As such, she often found herself without planning partners. She requested to be included in whatever group might unfold at BWES so she could collaborate with other STEM educators. Her dynamic presence was frequently the catalyst for spirited discussions.

Ms. Noble. Ms. Noble, an African American teacher, had the warm smile of a seasoned teacher who has spent most of her career with the very youngest learners. Her professional path started locally right out of high school, twenty-three years ago, in the baby and then toddler room of a child development center. She spent seventeen years as a Pre-K teacher before moving into early elementary school. She had the professional dexterity with hands-on learning that reflected years of experiential learning instruction through play that characterizes joyful learning in early childhood education. During her interview Ms. Noble concluded, “I just love what I do. It’s all I know about. It’s all I’ve ever done.” That is apparent watching her teach. Ms. Noble and Ms. Rayne had worked together for many years both at BWES on the same grade level teams at points and at earlier stages of their careers. At the time of the study Ms. Noble had just been moved to the same grade level as Ms. Rayne, contributing to the possibility of coming together as a community of practice.

Ms. Juarez. Ms. Juarez, a Hispanic teacher, was in her first three years of teaching. A graduate of the partnering university, she worked at BWES teaching summer school before taking a position as a classroom teacher. At the inception of this study Ms. Juarez moved grade levels to join Ms. Rayne and Ms. Noble. Naturally empathetic, good-natured and hardworking, she worked tirelessly to understand her students' needs and address them. Ms. Juarez was always

up for trying new things in her classroom and welcomed collaboration as we worked together to try out integrated STEM and literacy lessons with her students. As a grade level team, Ms. Juarez, Ms. Noble and Ms. Rayne were a well-oiled machine. As the dissolution of the university and county partnership became more of a reality, Ms. Juarez voiced uncertainty about remaining in the teaching profession stating, “My thoughts were, I’ll come here, get good at my job, and once I am good at it, then I can branch out into somewhere else. I thought I would be more prepared. I don’t feel prepared. I don’t feel like I want to look into more teaching positions”, highlighting the importance of collaborative team support for new teachers, like the relationship Ms. Juarez had working with Ms. Rayne and Ms. Noble.

Ms. Sims. Ms. Sims, a White woman, was a recent MAT graduate of the university, and like Ms. Juarez, was at the beginning of her teaching career. Taking a slightly different path, Ms. Sims worked in business for over a decade before deciding to move into education. Through a county grant she was able to pay for her master’s but was beholden to continue working in the county for several more years. Ms. Sims found support at BWES as a new teacher expressing, “A lot of why I wanted to work here is the staff. I could just tell they wanted to be here. They want to do things right and as well as they can.” Ms. Sims was energetic, optimistic, and curious, joining the CoLab just to see what it was about and to work towards fine tuning her own practice. She did not hesitate to invite me into her classroom to work with her on science talks and just for the joy of sharing lively experiential science instruction. Her classroom buzzed in the afternoons with productive student talk as they conducted investigations, talked through their ideas, and collected data in their notebooks.

James. James, a White man, was a vivacious and outgoing preservice teacher in his last year of the program. After Winter Break, at the time of this study, he had just begun his full-time

internship in Ms. Allen's room. Like Ms. Sims, James had been in the business sector for a decade before deciding to return to school. An opportunity tutoring ESL students inspired James to become a teacher. As this study unfolded James was in the thick of his edTPA task preparations. He joined the CoLab conversation during our fourth meeting and for the focus group. His input was candid and insightful. He was determined to finish his bachelor's degree but was not convinced he would follow a career path in education. Not yet fully identifying himself as a teacher he remarked, "I feel like teachers, when I look at it, you all are being taken for a ride because you deserve so much more for the amount of passion and knowledge and schooling that you do compared to other businesses". The curiosity and candor James brought with him compelled the CoLab discussions to dig deeper and presented a reminder of why teachers do what they do and the value of the profession.

Concurrent Data Collection in Three Phases

Phase One: The Pilot Study in Spring of 2022

The initial phase of the study was launched through simultaneous collaboration with Ms. Rayne and the leadership team, primarily Dr. Jenkins who was the leadership point person for restorative practices in the school. Ms. Rayne and I focused on science and literacy integration together, co-designing and co-teaching two units. The goal was to create student opportunities for student STEM/literacy experiences as part of the station rotations during guided reading that would complement whole class science exploration in the afternoon. While Ms. Rayne was an expert in classroom community building, literacy instruction and prioritized science and engineering experiences for her students when she was able. She was new to phenomenon driven science and was unsure about science and literacy integration. She also felt unsupported by her grade level team at the time and her emphasis on SEL set her room apart from the other

classrooms in her grade level. This project was a means of embedded professional learning for her in STEM and literacy integration and was also intended to be a model for other classrooms in how STEM and literacy integration can become a form of restorative practice through the building a community of learners in the classroom which included the teachers as active participants.

While I was working with Ms. Rayne, I also spent time with Dr. Jenkins. We developed the prototype for the survey, further explored RP, as well as designed and facilitated two professional learning events for the staff and pre-service teachers.

The first of the two events took place during a monthly staff meeting. This meeting was an exploration of a reflection and mindfulness tool Dr. Jenkins was working with called the *Courageous Conversations Compass* (Figure 5). The intention of the compass was to assist in reflection on where you, the individual, are as you enter a discussion The second event Dr. Jenkins and I conducted was an RP training for pre-service teachers at a mock conference the university held for the future educators. Dr. Jenkins and I explored more about RP together throughout the spring. We were interested in understanding how and when RP is a successful initiative. During this period, I reached out to the gentlemen who had run the RP professional

Figure 5. Courageous Conversations Compass

developments I attended so many years ago. He put me in touch with the provost of IIRP and I arranged a meeting with him and Dr. Jenkins to discuss RP training and RJE in general. The provost invited us to attend the IIRP 2022 International Virtual Conference. Dr. Jenkins and I split the sessions and developed a better understanding about how school wide RP initiatives can be effective. The conference, regular discussions, and our shared focus on RP professional learning at BWES provided me the opportunity to expand my knowledge of RP, gave me a sounding board for ideas and observations, in addition to a thinking partner and mentor, as the study coalesced.

Also considered part of the pilot student was the BWES Back-to-School science professional learning I designed and ran in August of 2022. I included it as part of the Phase One data because, while the CoLab planning session had taken place, it was at the Back-to-School science professional learning that we announced its inception and encouraged all the teachers to join us.

Phase Two

The emergence of what was to become the core of this research, the CoLab, began as a result of the University STEM Teacher Network Advanced Summer Institute. While Ms. Rayne was unable to join us, Ms. Allen, Ms. Judd, and Ms. Simon met with me at the beginning of August to discuss what this group might look like. The formation of the CoLab was introduced to the BWES teachers at their Back-to-School professional development in science in August 2022. The bulk of the qualitative data, the meaningful quantitative data collection and analysis occurred during this phase. This phase included monthly CoLab meetings, five in all, and collaboration with individual teachers and grade level teams. The CoLab meetings provided qualitative data for the study while the classroom collaborations were part of the joint enterprise

of CoLab members that fomented participation in the community of practice and partnership in the research. It was in this phase that participation in the CoLab ebbed and flowed. For the duration of the study, founding members Ms. Rayne, Ms. Allen, and Ms. Judd, as well as Ms. Rayne's grade level team, Ms. Juarez, and Ms. Noble, were central participants. Folded into regular and active participation in the CoLab was a new 3-5 beginning teacher, Ms. Sims. Also, adding to the depth of our discussions, during several meetings along the way were Ms. Allen's pre-service teacher, James; a specialist teacher, Ms. Schaffer; and Ms. Anderson. Data collection in this phase was completed in the middle of February 2023. The data was analyzed by me and was shared with participating teachers as a member check and for feedback. The end of Phase Two and the beginning of Phase Three are a somewhat blurred line. As the data from Phase Two appeared fruitful, the decision was made by me to apply for a renewal of the IRB which was to end at the start of April. With the approval of the IRB renewal, Phase Two will continue through the end of this school year. Qualitative data will be collected during the remaining CoLab meetings, the updated survey that was sent out in January will be sent out again in May to confirm and bolster the data, suggest a shift in teacher insights on RP and RJE, and/or reflect a significant difference or confirm the similarity in responses between teachers in the CoLab and those who did not participate.

Phase Three

This phase is yet to come but is beginning to take shape in the planning stages. Dr. Jenkins and I will spend time during the summer 2023 and the fall of the 2023/2024 school year analyzing the data together. While this dissertation was an agreed on first communication of our findings thus far, further communication and dissemination of this work has not yet been decided by the CoLab. Dr. Jenkins and I, however, have agreed to collaborate on at least one paper for

publication after we have integrated the new data to create a coherent story RP and STEM/literacy integration for the school year 2022/2023. The fall of 2023/2024 will find each of the primary participants in a new setting. As the partnership between the university and district was dissolved, and James and I will graduate, it appears we will all go in separate directions. The plan right now is for me to check in with each of the participants in their new setting to see what RP and integrated STEM/literacy practices they take with them and are successfully able to implement in their new school.

Data Sources

Quantitative

There have been three surveys extended to the BWES teachers, one in April 2022, August 2022 and in January of 2023. All three surveys were iterations of the initial one developed with Dr. Jenkins. They were developed to provide quantitative data to gain insight into BWES teachers' attitudes and beliefs about matters of (in)equity, social justice in elementary education, restorative practices, and discursive instructional practices.

The prototype for the survey was developed leaning into Elena Aguilar's (2020) ideas of coaching for transformation in her book Coaching for Equity. I considered her suggestions about a framework for identifying teachers' learning needs about matters of (in)equity. The notion was to use the survey in part to determine where teachers at BWES had areas of growth in order to plan more effectively the embedded professional learning specifically targeting development in areas of need. The ranking of teaching practices was developed from Agular's sequence of needs to address that spoke to an educator's instructional skills, content knowledge, emotional intelligence, and cultural competence. The survey also included questions to understand how teachers viewed themselves as educators and their professional epistemology. Dr. Jenkins

worked with me to develop the questions about RP specifically. Initially these were separate questions in which teachers used a Likert scale to express how comfortable teachers were using RP for: conflict resolution, discipline, to build collaborative communities, and for content learning. There was a final open ended question asking teachers to discuss how they felt RP implementation was working at Beechwood. Dr. Jenkins also asked me to include demographic questions in the event that would be useful down the road. This survey was shared with teachers in April 2022 during Phase One. The survey was again sent to teachers in August 2022 as Phase Two and new the school year got underway. I excluded the data from the first two surveys for quantitative purposes due to low response and the need to fine tune the instrument as the CoLab came into being. However, the data from the first two surveys provided some useful contextual information.

The survey from January 2023 was a simplified version of the original to foster greater participation and better align the survey to the research questions that had emerged and were reshaped as the research unfolded, particularly in relation to participation in the CoLab which had not yet emerged at the time the first two surveys were used.

The survey (Appendix E) was designed to gauge how the BWES classroom teachers understood and implemented RP and to determine if there was a relationship between participation in the CoLab and a different or shifting perspective on RP. The first four questions were demographically oriented, asking the respondent about the number of years they had been an educator; how they identified, this question was optional; their highest level of education; and whether they were participants in the CoLab. The next question delved into instructional styles the teacher identified with. The teaching styles that were supplied as options included traditional, social-justice oriented, collaborative, experiential learning focused, integrated curricula focused,

and a fill-in other option. Respondents could select as many as they felt described their instructional practice. This was followed by a question targeting the classroom management tools they used. The choices given in addition to a write-in selection included Class Dojo, clip charts and token economy which are associated with greater classroom control; and reflection journals and restorative circles which are often enlisted to assist students in learning how to self-regulate. This question also allowed for multiple responses. To understand how teachers prioritized certain instructional practices, a seven-point Likert scale was used for teachers to organize the practices from most important to least, recognizing they all are necessary when teaching. These practices included designing lessons for: student agency/autonomy, building relationships *with* students, building relationships *between* students, integrating curricula; rigor and relevance of lessons for students, developing clear routines and procedures; and use of assessment, the form of assessment was not specified. The next section asked teachers to share if they agreed, strongly agreed, disagreed, or strongly disagreed with the following statements: 1) Social Justice in Education is facilitating learning communities that nurture the capacity of people to engage with one another and their environment in a manner that supports and respects the inherent dignity and worth of all. 2) Social Justice in Education is about differentiation. 3) Social Justice in Education is intended to address the racialized infrastructure of our educational system. 4) Restorative practices prioritize repairing harm. 5) Restorative practices prioritize building community. This was followed by a question designed to elaborate on data that surfaced during the interviews. As this survey came out towards the end of the inquiry, the survey was tweaked to potentially expand on what it appeared the qualitative data was showing, although at this point the qualitative data had not yet been formally analyzed. Statements four and five were to get a sense of whether teachers made a distinction between proactive or reactive use of RP.

To gain insight into teacher professional learning spaces they were asked to rank a variety of possibilities from most relevant to least relevant followed. This question was followed by one asking respondents to share how often they engaged in RP as a means of conflict resolution, community building, discipline, or content teaching. Teachers were asked if they planned to use RP next school year, followed by an open-ended request to explain that answer for qualitative purposes. The survey ended with a place for teachers to leave thoughts or comments.

Qualitative

The qualitative data was primarily derived from semi-structured interviews, CoLab meeting audio, final focus group. The interview and focus group protocol aligned with the survey questions to expand on findings from the quantitative data. The structure of the questioning in the survey, interview protocol and focus group protocol was guided by Elena Aguilar's (2020) book *Coaching for Equity: Conversations that Change Practice.* The card sort I developed to understand teacher's pedagogical beliefs and instructional practices was inspired by Aguilar's approach to transformational coaching. A more thorough explanation of the card sorts will follow in the qualitative data collection section.

The semi-structured interviews were conducted with the key members of the CoLab as it unfolded. At the beginning of their involvement with this project, participating teachers were interviewed by me. Most of the interviews were in person and documented using handheld recorders, which were subsequently transcribed by a secure service and then cleaned by me into usable transcripts. Ms. Lloyd, Ms. Simon, and Ms. Allen were interviewed via a recorded Zoom meeting. Those interviews were also transcribed by me. The protocol for the interviews closely followed the quantitative survey questions. Card sorts were used for the questions seeking prioritizing or ranking. This allowed for elaboration on decisions and teacher reasoning about

what they found to be important in their work and why. The card sorts shifted somewhat between the pilot and the later interviews during school year 2022/23 began. Originally a card sort had been included trying to understand teacher epistemology. As the study unfolded, the background question in the updated protocol focused on teacher epistemology remained, but the sort was replaced with one seeking to understand the ways in which teachers used RP.

In lieu of post interviews, and in response to mounting time pressures on the participating teachers, a focus group was conducted at the beginning of February 2023. The protocol for the focus group closely mirrored the interview protocol but was adjusted to encourage discussion amongst the participants and to account for developments both in the research project and in the setting. The card sorts for the focus group were replaced with chart paper and sticky notes to capture teacher thinking. The focus group included Ms. Judd, Ms. Allen, Ms. Rayne, Ms. Juarez, Ms. Noble, Ms. Sims, Ms. Anderson, and James.

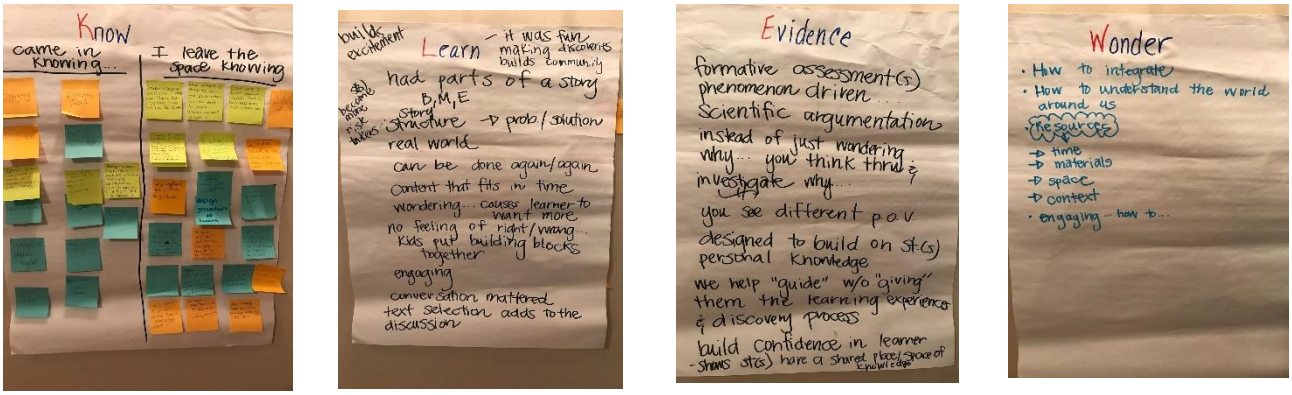
Additional sources of data included: my reflection journal maintained from September 2021 to November 2022, audio from the two RP professional developments events co-planned and conducted with Dr. Jenkins, the first in the spring of 2022, the second for BWES pre-service teachers and the other with the staff of the school; audio and artifacts from the Back-to-School science professional development for the BWES classroom teachers in August 2022; and artifacts produced in and through participation in the CoLab and BWES professional development. These artifacts included charts from both professional learning and science/reflection journals from the CoLab.

Of particular interest were the KLEWS charts from the BWES Back-to-School science professional learning. This data, I considered part of the pilot study because the CoLab had not yet gotten underway. KLEWS is an anacronym. The K represents what learners think they know

about the topic, L is what has been learned from the experience, E is what evidence they have for their learning, W is what the learners wonder about, S stands for the science and ideas and vocabulary they have learned. The KLEWS charts are reflection tools to assist in facilitating the tracking of the learners thinking and shifts in their thinking. I use KLEWS charts when exploring phenomena with students, using the KLEWS charts over the course of a storyline to both confirm what learners already know, surface misconceptions, and build on the learning community's existing knowledge and thinking on a given topic. I decided to see if it would work for teacher learning as well, leaving out the S on this occasion because I was more interested in tracking teachers pedagogical rather than canonical thinking. I opened the session inquiring about what the group thinks they already know about robust science teaching, followed by what they wondered. Over the course of the morning, with Ms. Allen serving as scribe, we revisited the charts, adding to L, E, W; as well as circling back to what we thought we knew before our exploration into how light travels with our student hats on (Figure 6).

Additionally, the *NC Teacher Working Conditions Survey* for 2018, 2020 and 2022 was used qualitatively to furnish a richer context for the study. Beginning in 2018 this survey is given every other year to teachers across the state and reflects how teachers view their relationships

Figure 6. KLEW charts



with students, leadership, and the roles they play in their setting. The three surveys cover all five years of partnership with the university and the RP initiative, shedding light on teacher and leadership views on student conduct, teachers' management of student conduct and teacher leadership.

Data Collection and Analysis

Quantitative Data Collection

The survey of BWES teachers administered in Phase Two at the end of the data collection window was designed to address the question: In what ways do teachers understand SJE and RP? More specifically: In what ways do teachers perceive SJE? In what ways do teachers perceive RP? In what ways are RP implemented? Is there a relationship between participation in a STEM community of practice and teachers' perceptions of RP and implementation? This measure sought to paint a picture of how RP and SJE were viewed as a part of the broader school culture and to explore if these conceptions were consistent with the participants of the CoLab or if engagement in the community of practice influenced how RP and SJE were understood. The survey was sent to 26 classroom teachers of which two teachers had left their positions over the winter break. Of the remaining 24 teachers there were 12 respondents, six who identified as members of the CoLab.

Quantitative Data Analysis

The first review of the data occurred in the initial organizing. The low response made it easy to see patterns in the data as it was examined, suggesting that the data was useful to provide only descriptive statistics. Charts were created to understand the data visually. A second pass of the data was conducted using an inferential statistical test in case something meaningful surfaced. Considering the data being ordinal, rank-ordered, normal distribution could not be

assumed, therefore a decision to use a non-parametric measure was made with the recognition that the power of the test would potentially not be as great (Harwell, 1988). Similar to the function of an un-paired t-test for comparison, the data from the January 2023 survey was analyzed using a Mann-Whitney *U* test, apart from question seven, which was a linear numeric scale. This test speaks to differences between groups from the same population, is effective with small data sets and is helpful with ordinal variables that do not have a precise scale (Nachar, 2008). The assumptions that support the use of this test for this study were that the two groups being explored, those that identify as members of the CoLab and those who do not, are from the same population; there is independence between participants, in other words the test is un-paired; and the scale is ordinal (Nachar, 2008). The Mann-Whitney *U* test was calculated by hand and used EXCEL three times to ensure accuracy of the computations. The sample size was twelve (n=12). The null hypothesis is rejected when $p < 0.05$. The null hypothesis, for the purposes of this analysis, was that no significant difference between the two groups, those who participated in the CoLab and those who did not, was demonstrated. The alternative hypothesis, therefore, was that a significant difference between the two groups was demonstrated in the data.

Qualitative Data Collection

The collection of qualitative data in this research spanned across the pilot study beginning in February 2022 through February of 2023. This data sought to add nuance to how teachers' opportunities to engage in a community of practice that focused on leveraging the inherent community formation which occurs when participating in a discourse rich science setting surfaces matters of equity. Teacher interviews were conducted both in person or via zoom depending on the time, circumstances, and teacher preference. The interviews occurred at various stages of the project as teachers became involved. Ms. Rayne was interviewed in April of

2022 during the pilot study. Ms. Simon, Ms. Judd, and Ms. Allen were all interviewed over Zoom during the summer after the Advanced Summer Institute occurred where the seed of the CoLab had been planted. The focus group occurred after school in the room the CoLab regularly met in at BWES as the data collection phase ended in February of 2023. The interview and focus group protocols (Appendix F) closely mirrored the quantitative survey questions (Appendix E). There were nine questions in all. The first two questions of the interview protocol addressed teacher epistemology. Those questions were not included in the focus group protocol because the information was redundant. Instead, we reviewed the group norms and jumped right in to creating a chart defining different teaching styles. The focus group had an ice breaker written in, but because this group was already comfortable with each other and for the sake of time, I decided to skip that portion of the protocol also. The ice breaker used Clymer Cards (Figure 7) as a visual representation of where on the Courageous Conversations Compass the teacher felt they were at that moment.

Figure 7. Clymer Cards

Card Sorts as Part of the Protocols. As part of the interview and focus group protocol (Appendix F) several card sorts were enlisted. To determine how teachers prioritized teaching practices, with the understanding that they are all important to instruction, teachers were asked to

place the cards in order of importance. For teachers interviewed via Zoom, Jamboard was used for teachers to manipulate the virtual sticky notes. Mirroring the question on the survey, the card sorts were designed to provide insight into how teachers considered relationships and student agency and autonomy, practices addressing curricula design and implementation. Figure 8 is an

Figure 8. Prioritizing Teaching Practices

example of how Ms. Judd organized her virtual sticky notes during her Zoom interview.

In response to the evolution of the study between the pilot and the inception of the CoLab, the focus of the second sort shifted. Therefore, teachers interviewed prior to the CoLab coming to be, were asked to sort a set of cards seeking to determine how their professional perspectives were developed as an epistemological exploration. This set of cards asked them to organize different professional learning opportunities a teacher might encounter over the course of a

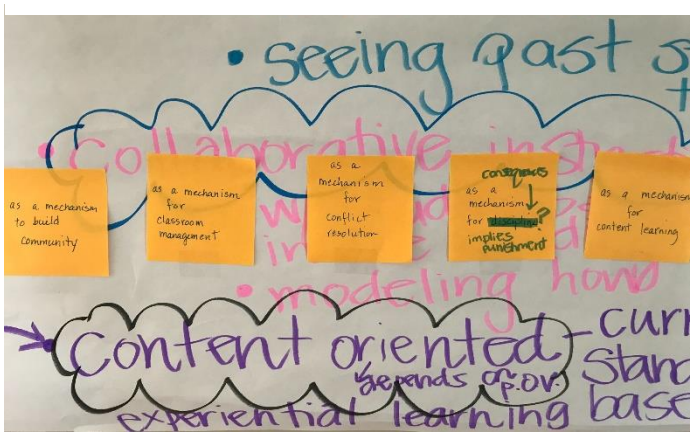
Figure 9. Teacher Learning Journey Card Sort

career. These included: collaborative discussions with colleagues, personal research, professional learning outside of BWES, professional learning through BWES, personal experience from K-higher learning, and pre-service learning. Figure 9 shows how Ms. Judd thought about her learning journey as a teacher. Teachers were given blank cards to add to the sort if they felt there was something missing. Ms. Judd added the card about learning from her students. This card sort was given to Ms. Rayne, Ms. Judd, and Ms. Simon. Prior to interviewing Ms. Allen in August 2023, this card sort was replaced with one that dug into how teachers used RP. This choice was made because the card sorts were an excellent medium for getting teachers to say more. Since I felt three card sorts was too many for this interview protocol, I decided teacher epistemology could be explored by asking teachers to reflect on their learning journey as an educator. This allowed me to dig deeper into teachers' thoughts on RP implementation through a card sort. The updated protocol began with Ms. Allen, who was also enlisted to provide feedback about the shift in the interview protocol. The new card sort asked teachers to organize how they implemented RP in their classroom and provided a blank one for any additions. The cards read as a mechanism: to build community, for conflict resolution, for classroom management, for discipline, and for content learning (Figure 10).

Figure 10. RP Implementation Card Sort

The sorts were handled slightly differently during the focus group protocol. As during the interviews, the sort was a device to elicit sensemaking and discussion. For the focus group simple seemed best. Each table of teachers was provided with a stack of tangible sticky notes with the same prompts written on them (Figure 11) as well as a piece of chart paper and markers. The question about defining instructional styles was thought through as a chart or poster to

Figure 11. Focus Group Card Sort



encourage group interaction and capture the reasoning about how and why they defined the styles the way they did. The groups were then asked to arrange the sticky notes in the same way the cards were used during the interviews.

In addition to the Focus group data, the data that explicitly addressed the qualitative research question(s) was collected during our CoLab meetings as both a function of the participatory process and a product of the research design. A planning meeting and five CoLab meetings took place in all. A digital notification was sent to all teachers and leadership at BWES a week prior to each meeting to elicit and encourage further participation. The meetings ranged from thirty minutes to an hour. The initial planning meeting took place in Ms. Judd's room and included Ms. Judd, Ms. Simon, and Ms. Allen. The CoLab meetings were held after school in the room used by the reading and math specialists at BWES. Participation in the CoLab was

influenced by teachers' personal schedules, schoolwide activities, and larger institutional decisions. The first meeting was held in September, there was an interruption to the schedule in October, then meetings resumed at the beginning of each month through February. The teachers determined the date for the upcoming meetings.

Although I offered at the end of each meeting to have someone else in the group take the reins of facilitation, I did not have any volunteers. The content and direction of the meetings shifted to attend to teacher workload and teacher morale due to changes at BWES. All meetings were designed to model an experiential learning cycle: experience, reflection, sense-making, and application (Appendix B). September's meeting focused on establishing group norms. This was done using Brené Brown's List of Values. Each teacher was asked to select three that were essential to feel comfortable fully participating in our group. The STEM focus was an activity designed to promote reflection of the teacher's science experiences. Teachers were asked to

Figure 12. Ms. Blankmann's Science Learning Map

create a map of their science learning journey over a lifetime. Figure 12 is an example of my science learning journey map. The rest of the meeting focused on how teachers planned to build community in their classrooms. Meetings in November through February were designed in response to the needs of the participating teachers. CoLab two focused on envisioning the

group's shared vision. As autumn was in full swing, it put me in mind of planting daffodils to naturalize. When bulbs naturalize the self-propagate and spread. I saw the CoLab as a naturalization of the University STEM Teacher Leader Network. The STEM focus of this meeting, beyond determining our shared vision and reason for being together, was a nature journaling exercise in notice and wonder exercise of a daffodil bulb. CoLab Three was a consideration of how circumstances, after the news of the dissolution of the partnership between the district and university at the end of the school year, shifted our shared vision. For this meeting the focus was on rethinking our shared vision. However, I also wanted the teachers to reflect on how their ability to do their jobs was influenced by the decisions and structures of the broader institutions they are members of. The reflection tool I used was literally mapping our personal and professional constellations. CoLab Four was designed to address the teacher's increasing stress that was present returning after winter break to the uncertainty of the near-term future of BWES. The STEM focus was intended to be the beginning of creating a library of storylines as a resource for the teachers to bring with them to their new settings whatever they might be. However, the launching activity, which was a design challenge of building a wall with smooth round rocks, provided a reflective space which the remaining teachers stayed in. CoLab Five was a recalibration of our joint purpose. As a tool to remind teachers why they do what they do, in this meeting the teachers began with journaling about something that made them smile that day followed by reflecting on something they noticed made a student smile that day. The STEM focus reversed the mapping experience from CoLab One. In this exercise teachers were asked to map the STEM learning journey they thought their students experienced this year so far.

The aim of the CoLab was two-fold. First, this was an opportunity space to collaborate with teachers across grade levels about how to effectively integrate STEM and literacy and why

it is important. It was a space/place for Ms. Rayne and I to share and further explore some of the strategies for integrated implementation and the positive outcomes for students with a professional collective. Second, through this exploration of collective engagement a space/place for reflections emerged for open and honest discussions about why the practice of integrating STEM and literacy is relevant to matters of (in)equity. Such a space/place set the conditions for reflection of individual practices in the context of the broader institutional struggle as a racialized system. Discussions connecting the community building that occurs when STEM and literacy are integrated with proactive enactments of RP provided an actionable approach to RP threaded through curriculum.

To visualize and articulate how the structure of the meetings might address the relationship between RP and integrated STEM/literacy and design for teacher learning I created a conjecture map (Appendix H). Conjecture maps are a means to address the complexity of the research design by articulating the most pertinent relationships in the design (Sandoval, 2014). There are three components to a conjecture map: the embodiment, mediating processes and intervention outcome. The learning characteristics that are reified through the designed learning space comprise the embodiment. In this design, contributing factors in resources, tools and materials we might take advantage of, the activity structure itself and specific discursive spaces that might nurture the building of our community of practice was considered. The mediating processes showed how the embodiments might be negotiated through participation in our community of practice. I conceived of the mediating processes in this work as a shift in a teacher's attitudes and beliefs about social justice in education, a shift in a teacher's professional identity, a teacher's use of integrated science and literacy practices and a shift in a teacher's views about the implementation of RP. The intervention outcomes were observable but gained

rigor when the mediating processes were present. Resources and materials were anticipated to impact teachers' use of integrated science and literacy practices most directly. The activity structures and discursive practices were expected to influence one or all four mediated processes. The intervention outcomes were the anticipated results of the mediated process. Possible shifts in teacher's attitudes and beliefs about social justice in education might influence outcomes in teacher's use of integrated science/literacy storylines, viewing science and literacy integration as a means of building community with the goal of becoming comfortable with integrating science and literacy in their classrooms and understanding that these practices are a means of building community. Shifts in a teacher's professional identity were anticipated to impact all intervention outcomes. Changes in views of RP implementation were expected to impact all outcomes but the initial one, which lacks the intentionality of building a community of learners when facilitating integrated STEM and literacy storyline.

Coding

General inductive analysis of the interviews, focus group, and five CoLab transcripts was utilized to interpret the ways a STEM focused teacher community of practice might center equity and potentially make visible the racialized nature the institution struggles with. I chose to use a secure service, Trint, to create the initial transcripts. I then listened to the audio in its entirety and ensured that the transcript I was working on read verbatim as the words were spoken. A hard copy was then printed of each transcript. I chose to use highlighters and hardcopies of the transcripts when coding. I wrote notes in the margins to keep track of my thinking and connections I was noticing. In addition, brief structured memos were written after cleaning up the transcripts for the Back-to-School science PD, Courageous Conversations PD with Dr. Jenkins, CoLab One and CoLab Four.

Thomas outlines (2006) five steps to the general inductive analysis process. The first task is the data cleaning. The second step of the analysis process is to do a close reading followed then by development of categories or themes. Thomas (2006) describes this phase as upper-level coding, general categories shaped by the analysis goals. This stage of the process, also known as open coding, can be expansive in selecting potentially useful data (Merriam & Tisdell, 2016). The open coding is followed by lower-level coding, a whittling down of broad categories. This whittling process continues in the fourth step as redundancies and overlaps in the categories are eliminated, until in the fifth step the researcher is left with no more than eight categories.

Open coding, in a study such as this, is perhaps a misnomer. As Blair (2015) points out "open coding are not *a priori* codes, and the researcher should not try to impose his/her own codes" (p.18). Yet being entirely objective about the data is an impossibility in a research design such as this one. I planned for, facilitated and was present for all the discussions, listened to the audio and cleaned the transcripts. I was already intimately familiar with the data before the open coding process began. As a result, I knew that the CoLab had crystalized as a community of practice and that many discussions about (in)equity had transpired as engagement with the idea of integrated STEM and literacy took place. I decided the best initial pass at the data with highlighter in hand should be guided by the research questions to surface the upper-level categories, seeking data that shed light on or addressed the research questions themselves. With his approach I was coding for concepts. With the qualitative data and the qualitative data that addressed the integrated data question(s), I first read with the questions in mind, marking quotes or exchanges that spoke to the question. I then reviewed them as a collection and came up with an upper level, broad category. At this point I moved one of three of the best passages to a table. I reread those passages, noticing conceptual patterns, surfacing two to three connected

categories. Table 1details the coding upper and lower-level coding categories for the research questions.

Table 1. Table of Coding

Text segments related to RQ's	Upper level categories	Lower level subcategories - emergent coding	Data sources
RQ2: In what ways does fostering a STEM focused teacher community of practice center equity?	Practice as: meaning community learning boundary Locality	Modes of belonging: • mutual engagement, • negotiated enterprise, • repertoire of negotiable practices	CoLab meetings Focus group
RQ2a: In what ways does a teacher community of practice focused on science and literacy integration surface *systemic inequity*?	Systemic inequity	• cultural relevance • cultural responsiveness • resources/lack of resources	CoLab meetings Focus group
RQ2b: How does the *integration of STEM and literacy* create a space for restorative practices?	Integrated STEM/literacy space	• belonging • safe space	Interviews Focus group
RQ3: In what ways does participation in a teacher COP focused on science and literacy integration serve as a mechanism to surface the racialized nature of the wider educational system?	Matters of (in)equity surfaced in RQ2a and RQ2b	• repairing harm • discipline • community building	Interviews Focus group
RQ3a: In what ways do teachers' implementation of RP contribute to or trouble the reproduction of inequity?	Proactive use of RP Reactive use of RP		

Qualitative Data Analysis

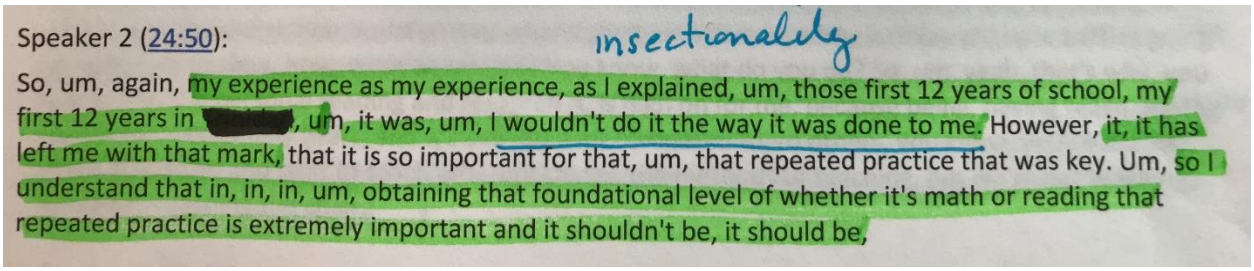
Research question 2 examined how a community of practice centers equity. The upper-level category that I mined for searched for evidence that a community of practice had coalesced using Wenger's constructs of practice as: meaning, community, learning, boundary, and locality. I used the data from the CoLab meetings and focus group to try to capture the interaction that characterized being a community of practice. The axial codes that emerged evidenced Wenger's concept of Modes of Belonging: mutual engagement, negotiated enterprise, and repertoires of negotiable practice.

Research question 2a addressed how a teacher community of practice might surface systemic inequity. Review of the CoLab meeting and focus group transcripts was read searching for evidence of systemic inequity in the quotes and exchanges. The axial coding surfaced three themes: 1) cultural relevance, 2) cultural responsiveness, 3) resources/lack of resources. The unit of analysis for the last qualitative sub question exploring how STEM and literacy integration might create a space/place for restorative practice was where the transcripts evidenced reflection on integrated STEM/literacy spaces. Here two categories bubbled up reflecting integrated STEM and literacy spaces as a place of 1) belonging, 2) a safe space.

Addressing The criticality of the questions required I read through the layered lenses of the synthesized theoretical frameworks. That is to say, that while I was reading the transcripts for evidence of a community of practice and the effects of STEM and literacy integration, I was also noticing where matters of equity surfaced to speak to the SJE and RP aspects of the questions. By doing this I was able to make visible in the coding where the racialized institutional struggle was present. To catch a brief glimpse at the nuanced nature of teacher professional learning and teacher instructional approaches within the broader racialized system required viewing the data

through both the CRT and SPT lens and allowed to some degree, for teacher and institutional historicity to stay visible, as well highlighting some of the ways in which racism remains present in our schools, shedding modest light on the undercurrents of essentializing attitudes and complications of intersectionality through amplifying voice and counter narratives. As an example, in Figure 13 I was coding for instructional approaches to STEM and literacy to address research question 2b when creating the upper-level categories, Ms. Simon's intersectionality became visible, along with the tension she navigated between her traditional background and instructional approach and recognizing that way does not work. I made the decision to not include this quote as part of the next iteration of coding because it did not speak sufficiently to the research question, but it did capture the nuanced way Ms. Simon negotiated her instructional practices.

Figure 13. Coding Through Multiple Lenses



The Point of Integration and the Role of Validity, Reliability, and Trustworthiness

The point of integration occurred after the quantitative data and qualitative data had been analyzed independently. Analysis of the initial quantitative data was carried out along the way in collaboration with the research team. This resulted in the exclusion of the first two surveys as quantitative data and their use only for contextual purposes. Analysis of the final survey was done concurrently with the qualitative data.

The qualitative data was analyzed by me, as primary investigator. The partnering teachers were engaged for member checking, seeking to share interpretations and receive feedback as patterns surfaced. The point of integration occurred in analyzing the qualitative data for supporting evidence to address the integrated research question: In what ways does participation in a teacher community of practice focused on STEM and literacy integration serve as a mechanism to surface the racialized nature of the wider educational system? For the initial engagement with this question the subcategories surfaced in research question 2a were used as upper-level categories. This pass at the transcripts was also made keeping sight of the quantitative data, considering where the qualitative data complemented each other or parted ways. The upper-level categories used to examine research question 3a how teacher's implementation of RP contributes to or troubles the reproduction of inequity was coded for proactive or reactive use of RP. This resulted in axial codes for three themes: 1) the prioritizing of repairing harm, 2) the relationship of RP to discipline, and 3) the role of building a community of learners in the classroom. As the quantitative data did not reflect a significant difference between teachers who participated in the CoLab and those who did not, research question 3b exploring how the CoLab supported or complemented the schoolwide training was removed.

The point of integration offered an opportunity for reflection on credibility, validity, and reliability (Creswell & Plano, 2017). At this point the quantitative data was analyzed again using the Mann-Whitney *U* test with the most recent pass of the qualitative data in mind. While the quantitative data was modest, it provided useful insights that were applied in the final pass at coding the qualitative data to examine the integrated research questions.

Recommendations by Merriam and Tisdell (2016) for how to attend to validity and reliability of qualitative data were considered in this research. The strategies outlined and

appropriate to the qualitative data collected in this study included but was not limited to triangulation of data, member checks and respondent validation, engagement with the data, researcher's reflexivity, audit trails, and peer review. It was essential to member check interpretations of the data with collaborating teachers to add robustness to the quality and credibility. Member checking occurred during meetings in which I would share with the CoLab how I was operationalizing terms like social justice in education and restorative practice as well as my interpretation of the data collected. Member checking also took the form of revoicing in the moment, particularly during interviews.

> **Ms. Blankmann**: What I think I am hearing you say is that the differentiation that you need to do in this classroom for your students is so different then what is happening in the other two classrooms…
>
> **Ms. Rayne:** yes
>
> **Ms. Blankmann**: …that it makes collaborative conversations less meaningful. (Rayne transcript, June 2022)

Onwuegbuzie & Johnson (2006) asserted nine types of legitimations to address the validity concerns that occur in mixed methods particularly at the point of integration. While the two forms of data provided an opportunity for triangulation, validity was also addressed through weakness minimization and multiple validities. Weakness minimization refers to the strength of one form of data to address the weaknesses of the other. In this study, the quantitative data was enhanced by the qualitative data providing more texture to the interpretation of the quantitative data. Conversely, the quantitative data provided a richer understanding of the CoLab participants' views relative to their colleagues that did not choose to participate. Multiple validities offer the opportunity to leverage high quality meta-inferencing from validity types across quantitative, qualitative, and mixed methods. Strategies to minimize validity threats specific to participatory

design: such as advancing the participatory lens early, sharing how the design addresses a participatory-social justice lens, forming a path for results to lead to action, and involving the participants in all stages of the project was implemented in this study (Creswell & Plano Clark, 2017). To further aid in this process, a checklist was created using Fàbregues, & Molina-Azorín (2017) table of quality criterion to guide the integrity of the study as it crystalized (Appendix I).

Ethical Considerations

In researching the ethical concerns of examining teacher-thinking, Sabar (1994) found the nature of the relationship between researcher and teacher took on two different flavors. One, there was a notable difference in status between researcher and teacher, the other constructing new knowledge collaboratively. During this study, I worked to build the latter relationship with the participating teachers. This raised several ethical concerns for me. First, I wondered about the ethics of disseminating the research and the role teachers play. We have talked about possible articles we might write together, particularly for practitioners' publications. There exists a tension around preserving their anonymity and crediting them for their participation in the research and writing. The second concern was navigating the line between the work we were doing being useful and helpful to the participating teachers, while also producing data that was robust. Lastly, I wanted to be considerate of next steps. The intention was to continue the CoLab meetings until the end of this school year. As our collaborative meetings were both the process and the product of this venture, with the completion of data collection, I intended to continue to co-steward our professional relationships and participate in the CoLab to ensure ongoing support from me for the teacher leaders I have partnered with. Phase Three will be informed by Phase Two. The concern I had going into this research about participating in the CoLab and then

moving on next school year was ameliorated by the dissolution of the partnership between the university and the county. It seems we will all start something new.

CHAPTER IV: FINDINGS

Phase One Findings

Quantitative Findings

Phase One of this study began with personal preparation, becoming familiar with the literature and thinking about how RP figured into this study. Dr. Jenkins and I had noticed the use of RP at BWES was primarily reactive. Additionally, calls to the office for leadership assistance in managing students was still a regular, for some teachers daily, occurrence. We agreed that many of the teachers that had been part of BWES at the inception of the RP initiative were apt at using circles for conflict resolution and repairing harm. It appeared the newer teachers were not as comfortable. Less evident was the proactive use of RP. There were a handful of teachers like Ms. Rayne who used morning meeting for the purposes of building community. There were also several teachers skilled in building a space of collaboration in their classroom, but kept tight control of their students' behavior, using activities and tasks that students found more engaging as a means of reward. I asked Dr. Jenkins to explore more about RP professional learning for teachers and coaches with me since he worked with both staff and students towards routine implementation of RP at BWES. Our first step was to meet with the Provost of IIRP, which my old RP coach set up. The following are my reflections on the debrief with Dr. Jenkins of that meeting.

> Had a great conversation with Dr. Jenkins debriefing our meeting with the provost at IIRP. We are very much on the same page. We both heard the provost saying that transformation comes from practice, not just bottom up or top down. It is a change in the way of being. We discussed possible actions moving forward. I wish I had recorded our conversation. It was packed. We are able to speak candidly about our experiences, our thoughts and experiences with race, our observations at MSPS, and possible approaches in planning embedded professional learning. We discussed facilitating a circle refresher with the whole faculty, possibly as soon as next month. I hope I have an IRB by then. We discussed working with pre-service teachers and modeling how circles and RP can be

> used for social emotional learning as part of the way we are in school instead of solely being used after the fact as an intervention to conflict. We discussed the importance of intentional questioning that gets to how a student is feeling, such as "What do you need today to be successful?" How can we help teachers understand taking time for restorative circles as a daily practice builds community, positive identity, and sense of belonging? These things are critical to motivation and self-determination (Deci et al., 1991). We recognize the need for a shift in mind-set, building on reflective practice. Dr. Jenkins suggested we encourage teachers to keep journals, much like this one, in which teachers center their thoughts on their engagement with lessons, students, colleagues, the day - really being explicit about self-reflection. We also discussed how to model using circles as a "pulse check" of the learning community. Demonstrating to teachers the importance of having a plan and not just holding a circle willy-nilly. But circles used as resets need to be intentional and planned ahead of time. (Journal entry, 1/21/2022)

This segment speaks to how Dr. Jenkins and I began to put together a plan to reinforce proactive RP at BWES. Much of the preparatory work we did occurred while waiting for IRB approval. The quantitative survey prototype developed with Dr. Jenkins in January 2022 was influenced by the work of Elena Aguilar (2020) In the following journal entry, I articulate where some of the survey framework was generated.

> I have been participating in UNCG faculty discussions on a book called *Coaching for Equity* by Elena Aguilar. She speaks of developing a positive classroom culture through nurturing teachers' skills, knowledge, capacity, will, cultural competence and emotional intelligence. I think that the strength of my modeling plan is that it will further develop relationships across all members of the community. I am hoping by expanding on reflection as a tool we will be able to show some transformation. (Journal entry, 1/12/2022)

As I took part in the book study, I shared with Dr. Jenkins how I was thinking about aspects of the survey. In addition to understanding how teachers perceived their instructional practices, I felt it was important to have a question that gave some insight into how teachers self-identified in relation to their instructional practices and the epistemology of their instructional practices. Dr. Jenkins worked with me to shape the questions directly related to RP as we tried to gauge the ways in which teachers at BWES understood and implemented it.

With the approval of the IRB the first survey was sent to the classroom teachers. This survey was sent to thirty-one teachers and support staff, with ten responses. In response to how the teachers viewed their teaching styles (Figure 14), one teacher selected everything but social justice oriented and four teachers considered themselves both traditional and social justice oriented. The question asking teachers to prioritize the most important teaching practices was not helpful because teachers selected multiple practices as the most important, although it is worth noting that eight of the ten teachers felt building strong relationships with students was the most important practice while only three of the ten indicated that building strong relationships between students was the most important. The question addressing epistemology asked teachers to rank the influences on their teaching practice from least relevant to very relevant (Figure 15). Seven of the ten teachers stated collaborative conversations were the most influential on their teaching practices while early educational experiences and professional learning through BWES was less relevant. Teachers were comfortable using RP in general. Six of the ten teachers answered that they were very comfortable using RP as a tool for conflict resolution, building community and discipline (Figure 16). The questions about how RP was implemented at BWES and how teachers viewed Social Justice in Education were long answers, useful qualitatively. For the final survey sent out in January 2023, I felt it was prudent to ask these questions, so the answers were quantified to make teacher time spent taking the survey briefer and to clarify when I analyzed the data the similarities or variations in responses.

Figure 14. Teaching Styles - Pilot Study

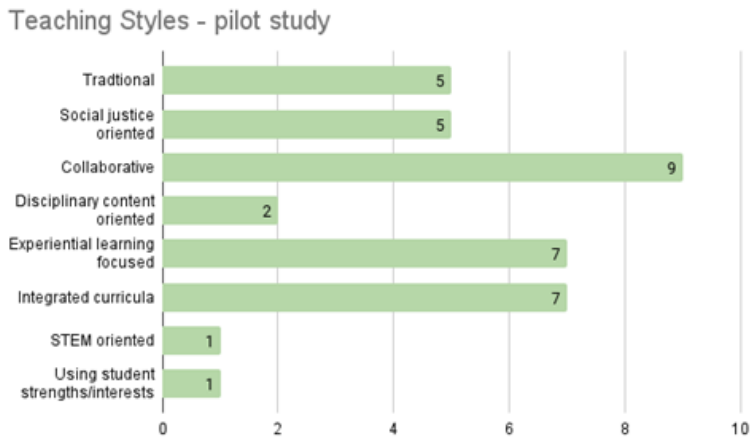


Figure 15. Influences on Teaching Practice

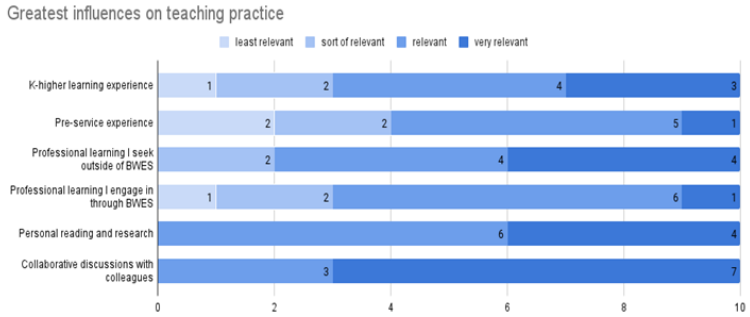
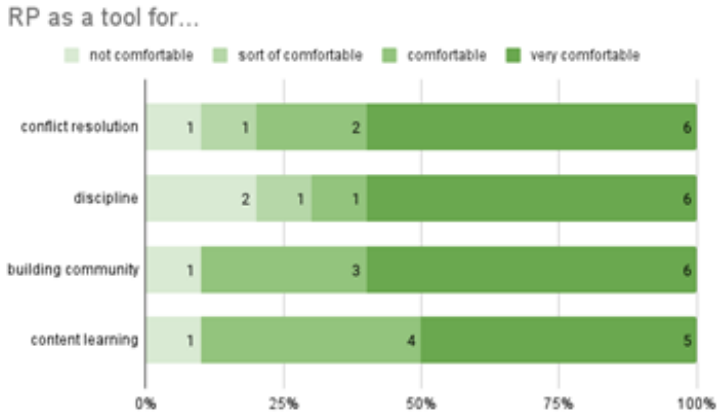


Figure 16. RP as a Tool

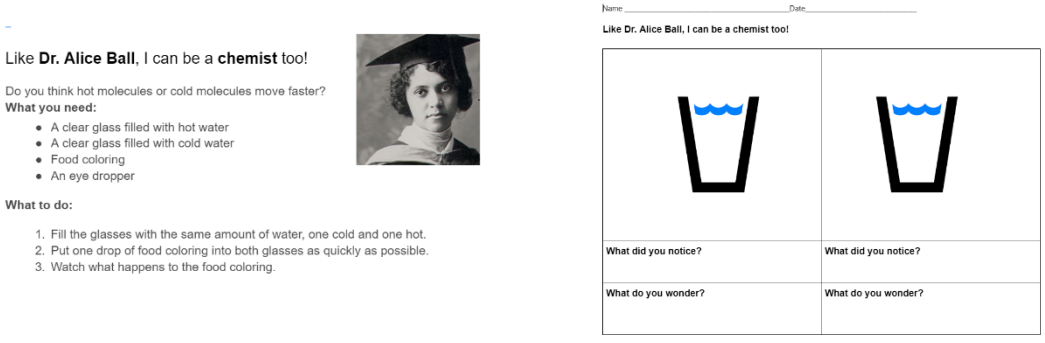


Qualitative Findings

The qualitative findings from the pilot came largely from my journal entries, which was critical in tracking both what I was doing to lay the groundwork for the study, Ms. Rayne's interview which was the test drive for the interview protocol, and the survey responses from April 2022 that asked for long answers and the transcripts and KLEWS chart artifacts from the Back-to-School science professional learning I ran in August 2022. This brought forward two findings that were critical in thinking about Phase Two. First, integrated STEM/Literacy did create a space/place that fosters community for the students and holds the possibility of being a proactive RP by this study's definition. Second, the shared space of collaboration makes room for teacher's identity in practice to transform.

During the pilot, I was still planning for the bulk of the STEM/literacy integration to take place in Ms. Rayne's classroom. We designed STEM/literacy experiences to leverage the idea of proactive restorative circles as a location for robust science talks and using the student's excitement for doing science as a means of building a community of learners, embodying the definition for RP I developed as *the proactive enactments of the community towards developing a sense of well-being for all the involved individuals through learning as belonging and doing*. The idea was to inspire her grade level team at the time to join in once they realized there was something different happening in her room. Data collection did not officially begin until April,

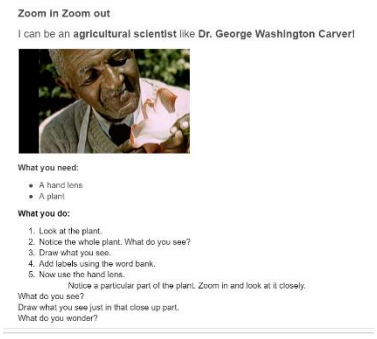
Figure 17. Dr. Alice Ball Micro-Investigation



but Phase One straddled a period of planning and the execution of the pilot. During February and March, Ms. Rayne and I planned and taught together. Ms. Rayne was interested in some of the STEM/literacy integration happening during her guided reading time stations, resulting in an investigation station. We initially tested this strategy with a unit we planned that also integrated the BWES observation of Black History Month. The stations were organized so students visited each station once during the week. The Black History Month unit spanned three weeks. We used the afternoon science slot for the read aloud biographies.

I designed weekly STEM micro-investigations that aligned with three Black scientists, two historical figures: and chemist, Dr. Alice Ball (Figure 17) and an agricultural scientist, Dr. Carver (Figure 18) I included a living and working scientist as well. Dr. Gina Pressley (Figure 19) who does forensic science. These STEM experiences were accompanied by read alouds of the scientists' biographies. For Dr. Carver we selected Susan Grigsby's book *In the garden with*

Figure 19. Dr. Carver Micro-Investigation



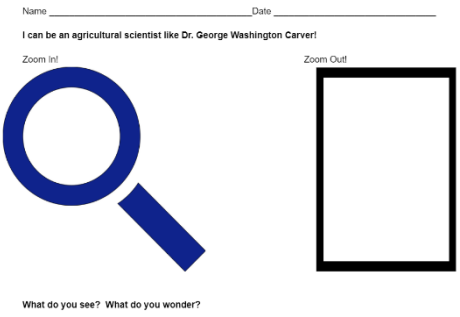


Figure 18. Dr. Gina Pressley Micro-Investigation

I can use **chromatography** like **Dr. Gina Presley**

Notice how a single color is made up of others

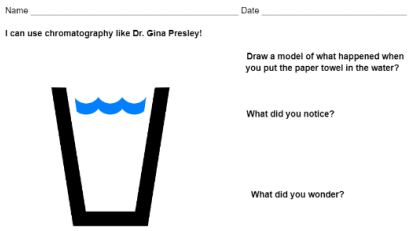
What you need:

- Piece of paper towel
- Markers
- Glass of water

What to do:

Draw a stripe in a single color about halfway up across a piece of paper towel. Dip the bottom of the paper towel in the water. Be careful to only dip the white part.

- What do you notice happening?
- Why do you think that is happening?
- What do you wonder?
- What do you think will happen if you do it again with a different color?
- Try it again using a different color.
- What did you notice this time?



Dr. Carver illustrated by Nicole Tadgell. The biography of Dr. Ball was read from *Little Leaders: Bold Women in Black History* by Vashti Harrison. While I learned about Dr. Presley from the book *Black Women in Science* by Dr. Kimberly Brown Pellum, I decided it was developmentally too mature for the grade level. Instead, we read the page about Dr. Presley from a booklet I had created of African American scientists, which I had created to share with the BWES teachers schoolwide.

In the journal segment below I discuss how I rolled out the investigation stations. This reflection points to how STEM/literacy fosters discussion with students, builds enthusiasm for STEM and becomes a means of building community.

> I have spent quite a bit of time in Ms. Rayne's room this week. She asked me to create a station for the kids to do during the guided reading stations. She is not doing science for the next few weeks but focusing on Black History Month. So, I gathered a group of African American scientists that are less well known. For the stations, I modeled investigations that gave the kids a flavor of the type of science the science heroes engage(d) in. My lessons are attached. In the afternoon I introduced whole group the book *What do Scientists do all day?* We had a great discussion about what they thought science was and scientists do. I introduced the first page, and we talked about conservationists. I was able to talk about a few of the scientists I selected in that context. The kids are wonderfully insightful. They have a good sense of science and engineering. I have done investigation station with two groups now. I have not been recording because I don't have the IRB yet. I wish I could have. The conversation was rich. What I did takeaway is that the children love doing hands-on activities and that doing even small science and discussions with them creates a sense of community. They asked me to come and eat with them today. Ms. Rayne and I also had a lovely conversation about teaching, hopes and fears, and parenthood. It was a good bonding experience. (Journal entry, 2/3/2022)

My thoughts are supported by Ms. Rayne's interview that took place the following June, when she described a social justice orientation to instruction as collaborative and then adds instructional style peer instruction, describing how these instructional styles build community between her students.

Ms. Rayne (02:43) I would say that social justice oriented instructional style involves the students more and you involve more of their feelings and how they feel about things. and kind of their interest in things.

Ms. Rayne (03:01) Collaborative instructional style is the same as <laugh> social justice oriented. So, you're together. It's more integrated and not as blocky type schedule, but you integrate things, and you find reasons that this connects with this and it's more thought provoking.

Ms. Blankmann (03:33) So I what I am hearing from you that you think the social justice oriented, and collaborative are, they overlap?

Ms. Rayne Right.

Ms. Blankmann Okay. Content oriented. Is that a standalone or does it overlap with one of those areas possibly also?

Ms. Rayne (03:51)The content. It depends on because, okay, so like we've done, we've integrated science and that content with other subjects. So, I mean, it can be collaborative too. You can, you can take science into reading. We even took math into reading this week with CVC words.

Ms. Blankmann (04:24):Ok. What about an experiential learning instructional style

Ms. Rayne (04:28):That would be the students actually get hands on and it's more, you allow them to think about why they're doing something and why something happens and they figure out the why by doing

Ms. Blankmann (04:56) Are there any instructional styles that you can think of that I didn't suggest?

Ms. Rayne (05:04) I would say peer. Because I have seen the kids help each other they will go to each other and say, “Nope, that's not how you do that. You gotta do it like this” and they'll show the other one. Or they will say, “Hey, did you look at this? I saw this.” It's that peer instruction where I'm, I'm kind of hands off on that. I let them do what they want to.

In this final thought Ms. Rayne describes a shared space with her students, making room for them to take up the role of expert. She sees this as a form of collaboration for students. Additionally, for her, the collaborative and social justice oriented instructional styles align while at the same time STEM and literacy integration can overlap with collaboration. A minute later when asked how she would describe her teaching style she says she is a combination of

collaborative and experiential, saying, “We always are talking and discussing, what we are gonna do and why we are gonna do it.” She herself describes experiential learning as learning by doing and herself sees the value in making room for peer collaboration, and equates collaboration with experiential learning, supporting the idea of RP as *proactive enactments of the community towards developing a sense of well-being for all involved individuals through learning as belonging and doing*.

The idea of students as experts and the benefit of collaborative STEM exploration as a means of building community was voiced again by several teachers during the BWES Back-to-School science professional learning I ran in August 2022 before the students returned. I include this data in the pilot study because at this point only the CoLab planning session had occurred. We finished this professional learning by announcing the first of the monthly CoLab meetings and encouraging teachers to join. This professional learning focused on engaging teachers as students in a part of a mini storyline exploring how light travels, which included a formative assessment, connected investigation and a Teaching with Text lesson and then stepping back and deconstructing the experience. To track teacher thinking I used the KLEWS charts I mentioned in the Methods section in reference to additional artifacts. The following excerpt is part of the deconstruction discussion.

> **Ms. Judd** (00:31:18) It’s like kind of an SEL connection. You're facilitating a kind of debate where the kids explore each other’s thinking. “Do you agree or disagree?”
>
> **Unidentified** (00:33:55) That's what I was going to say. I think listening to your group talk about it helps you because when I saw my idea, I thought that doesn't make any sense. But I know when I heard other people kind of elaborating on that, it built my confidence a little bit. I know something about this.
>
> A few minutes later I asked about creating the conditions for collaboration and exploration referencing laughing that was going on at one of the tables.

Ms. Blankmann (00:35:25) What happens when you have a group of kids and you put a group of kids together and create a space that is fun and engaging? What happens next?

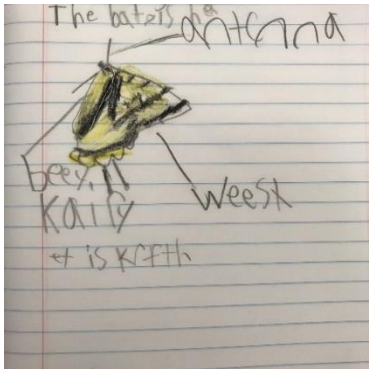
Unidentified (00:35:36) They learn something.

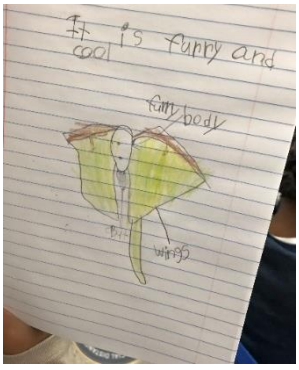
Ms. Blankmann (00:35:39) For sure. What else happens?

Ms. Sims (00:35:42) It builds community.

In addition to the connection between integrated STEM/literacy and building community that is evident in this part of the discussion, a shift in thinking was demonstrated in review of the KLEWS charts. I began the discussion by asking teachers to share what they thought they knew about robust science teaching. The sticky notes reflected that teachers understood this to mean the lessons primarily needed to be hands-on, engaging and collaborative. They did not mention community building or discussion, and only one person mentioned integrated science and literacy. After concluding the lessons as students and subsequent discussion, we revisited that question to determine what they have learned. Here six teachers mentioned community building, eight teachers mentioned science/literacy integration and two people mentioned the value of discussion. One teacher connected the speaking and listening in productive argument to building community when writing, "Community is built because students learn to hear and respect each other's ideas". Another teacher summing it up by stating, "Thinking of science discovery as storytelling/ways to integrate different subjects to lead and facilitate discoveries/allowing space

Figure 20. Notice and Wonder





for creativity and fun/problem solving together makes a stronger community and more outgoing students." Support Ms. Rayne's train of thinking and further supporting the idea of the possibility for STEM/literacy integration to be a RP as the *proactive enactments of the community towards developing a sense of well-being for all involved individuals through learning as belonging and doing*. As February came to a close, Ms. Rayne and I introduced Charles Henry Turner, a renowned African American entomologist, to the students by reading *Buzzing with Questions: the inquisitive mind of Charles Henry Turner* by Janice N. Harrington, illustrated by Theodore Taylor III. This was a segue from learning about what scientists do into a life science unit on life cycles. This proved to be a rich experience for everyone involved. Sticking with the idea of investigation stations during guided reading, I developed a series of explorations, first launching with a notice and wonder of butterfly specimens, observing and asking questions, like Charles Henry Turner (Figure 20). That exploration was then followed with resin models and modeling of insect life cycles for students to self-navigate. These experiences were to compliment the whole group encounters with observing Painted Lady caterpillars become butterflies, followed by incubating chicks. We supported the self-navigating investigation stations with read alouds including *Waiting for Wings* by Lois Ehlert, *The Butterfly* by Patricia Polacco, *Where Butterflies Grow* by Joanne Ryder, *A Butterfly Is Patient*, Dianna Aston, and *Señorita Mariposa* by Ben Gundersheimer. This unit unfolded over the course of March and the first few weeks of April due to weather, illness, and spring break interruptions. Using the resin models' students became familiar with the life cycles of butterflies, bees, and dragonflies. Students examined and selected models of the insect's stage of development and matched them with labeled cards that they were

then able to draw and label in their notebooks (Figure 21). The class continued to observe the Painted Ladies together as they moved through all the cycles, finally culminating in a grand release that involved tears, students hugging and waiving and lots of goodbyes. In the following account from my journal both examples how we used the books we selected to both support the science and ELA skills we were addressing. It also marks the beginning of a shift in how Ms. Rayne saw herself through the eyes of colleagues.

> This week we have been celebrating Dr. Charles Henry Turner. We have been working on being entomologists: noticing/wondering and using identification cards to figure out what different insects are. I brought in specimens of a spider, chaffer beetle, dragonfly, butterfly, wasp, cricket, and a cicada. They have been comparing and contrasting at least two different insects to bolster that skill since they have been doing it in ELA - *CCSS.ELA-LITERACY.RI.2.9 Compare and contrast the most important points presented by two texts on the same topic.* The kids are excited and doing wonderful work. They are really working on using their phonics skills to write about what they see. Today a young man who has really been struggling wanted to label the antennae on the cricket model he drew. He knew the word already. He made the effort on his own, writing the word *entenu*. This was such a huge leap from where he had started, Ms. Rayne cried when we showed her his work. She said she appreciated working with me and appreciated being seen as a capable and talented teacher.

Ms. Rayne's response to her student's work and my recognition of the fruits of her labor with this child is reflective of the social dimension of learning can transform identities as "it transforms our ability to participate in the world by changing all at once who we are, our practices and our communities" (Wenger, 1998, p. 227). This story continued as Phase Two unfolded.

Figure 21. Models and Modeling

Phase Two Findings

Used descriptively, the quantitative data on its own served to provide a cursory understanding of how SJE and RP were understood by teachers at BWES but was largely not nuanced enough by itself to suggest a relationship between participation in the CoLab and views about RP and implementation. The qualitative data shed light on how a STEM community of practice can center equity by becoming a comfortable space/place for teachers to share their ideas about matters of (in)equity and instructional strategies that support RP. The qualitative data also presented insights into the ways that integrated STEM and literacy fostered RP. The quantitative and qualitative data taken together brought into focus how a community of practice designed around STEM and literacy integration can become a space/place that makes visible the racialized nature of the U.S. educational institution. The integrated data surfaced how teachers' understanding and implementation of RP can trouble or contribute to inequity.

Quantitative Findings

The quantitative data addressed the broader question: In what ways do teachers understand SJE and RP? The sub-questions that examined aspects of the overarching question were: In what ways do teachers perceive SJE? In what ways do teachers perceive RP? In what ways are RP implemented? Perception in this case refers to a teacher's interpretation of what is meant by SJE and RP and how that interpretation is visible through their instructional practices. The quantitative data was gathered from the January 2022 survey and represented 50% of the 24 BWES teachers who received the survey. Of the twelve respondents, six identified as participants of the CoLab. The Mann-Whitney *U* test was used to determine if there was a statistical difference between the responses of the two groups with responses to teaching styles (Table 2), RP as a tool for classroom management (Table 3), and management tools (Table 4).

Table 2. Table of U and U' Results for Teaching Styles

Teaching styles	Sum of the ranks CoLab	Sum of the ranks Not CoLab	U	U′
Traditional	36	42	21	15
Social justice oriented	45	33	12	24
Collaborative	42	36	15	15
Experiential	51	27	6	30
Integrated curriculum	45	33	12	24

Table 3. Table of U and U' Results for RP as a Tool

RP as a tool for…	Sum of the ranks CoLab	Sum of the ranks Not CoLab	U	U′
Conflict resolution	5.5	33	12	24
Discipline	6.8	41	20	16
Building community	5.5	33	12	24
Teaching content	4.5	27	10.5	20.5

Table 4. Table of U and U' Results for Classroom Management Tools

Classroom management tools	Sum of the ranks CoLab	Sum of the ranks Not CoLab	U	U′
Class Dojo	8	48	27	9
Clip charts	5.5	33	12	24
Token economy	6.5	39	18	18
Reflection journal	5.5	33	12	24
Restorative circles	4.5	27	6	30

The null hypothesis is rejected when $p < 0.05$. In all cases, this research failed to reject the null hypothesis demonstrating there was no significant difference between the two groups' responses.

This provided some insight into how SJE and RP are taken up by teachers at BWES as part of the school wide initiative but did not reflect an appreciable impact of the CoLab at that juncture.

To assist in understanding how teachers think about SJE, they were asked if they agreed with Evans and Vaandering's (2016) definition of RJE as: *Facilitating learning communities that nurture the capacity of people to engage with one another and their environment in a manner that supports and respects the inherent dignity and worth of all* (p. 8).

All teachers agreed with this definition and while there was no measurable difference between the two groups, teachers in the CoLab did feel a little more strongly about it. Likewise, there was no discernible difference between the two groups when teachers responded to the statement: *Social Justice in Education is intended to address the racialized infrastructure of our educational system.* Two CoLab members strongly agreed, and the remaining members agreed, while five of the non-participants in the CoLab agreed, and one disagreed. Additionally, teachers associated SJE with differentiating students' needs. Six of the twelve respondents viewed their teaching style as being Social-justice oriented (Figure 22). In both groups there was no distinction made in using RP proactively or reactively. All twelve of the teachers agreed or strongly agreed that RP prioritizes repairing harm and RP also prioritizes building community. This was supported by the questions inquiring how often a teacher used RP for conflict resolution, discipline, building a classroom community or content learning (Figure 23). Restorative practices were used as a means of conflict resolution two to three times a week with half the teachers and daily with the other half. Seven of the twelve teachers stated they used

restorative practices as a tool for discipline two to three times a week and two used it daily. Only one CoLab teacher stated RP was never used for that purpose. When asked how often they used it for building a community of learners in their classroom ten of the twelve teachers said daily while the remaining two used RP for this purpose two to three times a week. As a method of teaching content, RP was used by eight of the twelve teachers, two to three times a week, by three daily and one responded that never used RP in this way.

In terms of practices that embody SJE and RP concepts (Figure 24), eleven of the twelve teachers said building relationships *with* students was the most important when asked to rank instructional practices from most important to least. Building relationships *between* students was likewise ranked by eleven teachers as important. However, contrary to the idea of community building through RP, Class Dojo was used by seven of the ten teachers, clip charts and token economies were used by four (Figure 25). This suggests that while teachers understood the value of building relationships with and between their students, they did not recognize that the use of these methods runs counter to the definition of SJE in that they are inherently mechanisms of power (Manolev, et. al, 2019; Williamson, 2017). The teachers were unanimous in their intention to use RP next year. Overall, the quantitative data made clearer how teachers interpret SJE and RP. First, teachers understood SJE addresses a racialized educational system through classroom communities that foster well-being for all students. Second, they prioritized the use of RP to repair harm and build community equally.

Figure 22. Teaching Styles

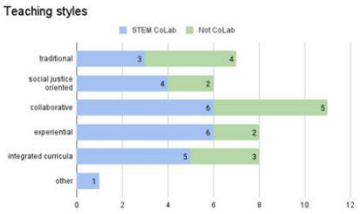


Figure 23. RP as a Tool

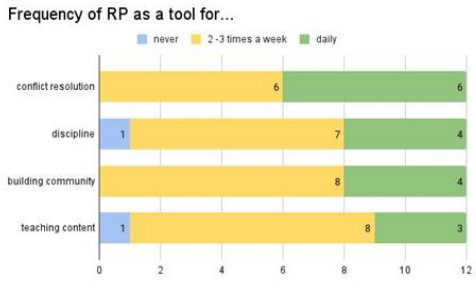


Figure 24. Ranked Teaching Practices

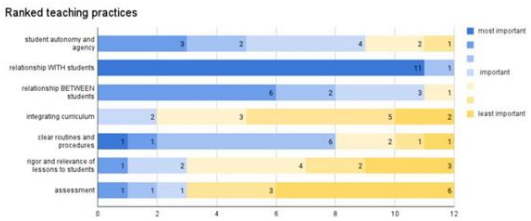
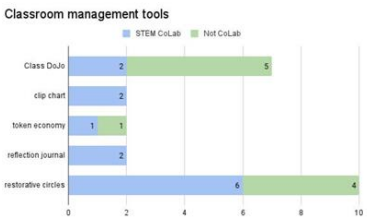


Figure 25. Classroom Management Tools



Qualitative Findings

The qualitative data investigated the question: In what ways does fostering a STEM focused teacher community of practice center equity? The focus group and CoLab data were analyzed first to determine whether the CoLab had coalesced as a community of practice. The qualitative data surfaced evidence of mutual engagement, negotiated enterprise and repertoires of negotiable practice. The research sub questions served as the lens for examining the discourse to answer: 1) In what ways does a teacher community of practice focused on science and literacy integration surface systemic inequity? 2) How does the integration of science and literacy create opportunities for restorative practices? The qualitative data presented two findings. First, a teacher community of practice focused on STEM and literacy integration can become a space/place for forthright discussions centering equity. Second, STEM and literacy integration has the potential to become a proactive enactment of RP.

The CoLab as a Community of Practice

There is ample evidence of the emergence of the CoLab as a community of practice through aspects of mutual engagement, negotiated enterprise and repertoires of practice. During the first meeting, norms were negotiated. Present at that meeting were the core founding members: Ms. Allen, Ms. Judd, and Ms. Simon. The group was given a list of Brené Brown's List of Values and asked to select three to five that were essential for them to be able to fully participate in the CoLab.

> **Ms. Blankmann** [00:03:06] Wait, so hold on a minute. So, all three of us have belonging.
>
> **Ms. Allen** [00:03:08] Yep. That's a big one.
>
> **Ms. Blankmann** [00:03:10] Okay. So, belonging is important.

Ms. Allen [00:03:11] That's interesting. (Reading her list) Belonging, Compassion, Honesty…Justice, Kindness.

Ms. Blankmann [00:03:22] I had stewardship. Stewardship of relationships. So that kind of relates to what you just said.

Ms. Judd [00:03:38] I had openness and well-being.

Ms. Blankmann [00:03:38] Openness and well-being. All right. So, I am feeling like this as a place of belonging is important. Feeling like we have a connection, compassion.

Ms. Allen [00:04:36] I kind of have that saying, "It's that feel good feeling".

Ms. Blankmann [00:04:39] Yeah. Yeah. No, I get it.

Ms. Simon [00:04:42] Safe space.

Multiple people [00:04:42] Safe space

Ms. Judd [00:04:44] Yeah. That's what I felt like, by well-being.

Ms. Blankmann [00:04:48] That sort of wraps into understanding and kindness and loyalty. I think ultimately this then becomes a space of trust. Which goes with the stewardship and the connection.

Ms. Judd [00:05:24] Maybe like finding our shared goals. Like our shared vision.

Ms. Allen [00:05:39] Shared vision. I Like that. The belonging thing sort of captures everything. I find it very interesting that the three of us all, that was my first one I wrote.

This marked the beginning of the negotiation of joint enterprise–participation and reification shaping what it meant to be part of the CoLab. These ideas were developed into four bullet points that were included on a slide and shared at the beginning of each meeting:

- This space is one of belonging.
- The way we engage together nurtures a sense of safety, trust, openness and well-being through connection.
- We do this through authenticity, reliability, and cooperation.
- We are each stewards of our community of practice.

The nature of the norms that developed from the teachers' needs to be met to fully participate in

the group, suggested the community of practice be inherently a place/ space of RP, embracing and calling on the requirement of *the proactive enactments of the community towards developing a sense of well-being for all the involved individuals through learning as belonging and doing*, the definition of RP this research utilized. During the first three meetings the norms were read out loud. By our last meeting, indicative of the group crystallization as a community of practice, the norms became part of the increasingly brief preamble to getting started.

Mutual engagement is characterized by inclusion, diversity and partiality of members (Wenger, 1998). Necessarily, being included in a group is a parameter of engagement. In the case of the CoLab, inclusion was voluntary, and participation was (re)shaped during each meeting by the presence or absence of members and the loss or addition of members. Participants in the CoLab were connected through diverse and complex ways. At the beginning of the school year, Ms. Juarez and Ms. Noble joined the group at the behest of Ms. Rayne when their new grade level team was formed. Ms. Anderson joined us for the second meeting and was greeted with hugs and "Hey girl! How are you doing?" by Ms. Noble and Ms. Rayne. As it turned out they had all worked together in the early days of their career, an overlapping constellation of practice. The CoLab offered them an opportunity to catch up and reminisce during the meeting while also participating in the activities and conversations. The diversity and partiality of the CoLab was evident professionally and personally. Partiality as a dimension of mutual engagement refers to the competence of the individual in relation to the competence of others. In other words, complementary contributions and overlapping competencies make room for ways to engage in the collective. As an example, Ms. Sims joined us for the first time in November. She was quiet for the first 26 minutes, but then Ms. Anderson asked how other teachers were not crowding to join us.

Ms. Anderson [00:25:42] That's what you want in your school. You know? I mean, I don't know anything about your school. I'm just gonna speak about the staff. Where's the...like, what kind of like, where's the buy in for those that aren't here? Why are they not here? Because we need to make a commercial. I mean, I'm serious. I mean, they just don't know what they're missing.

Ms. Sims [00:26:09] I think things like this do feel like hard work for people.

Unknown: Yeah.

Ms. Sims: We just got back from a conference. In one of the sessions, they had them writing about like, what's your school culture? And eighty percent of that poster was covered with words like stress and overwhelmed. And a lot of it was like, "but we care about our kids", you know? It was something like, "that's why you're still doing it and part of it". But I think people look at a meeting like this, it's like, well, they're going to tell me I have to do something or that's time I don't have.

Ms. Anderson [00:26:37] Is it something that you do or is it just a mindset? You know, I feel like this is such a mindset. It doesn't even feel like work. It feels like we are, we're making the future and we're giving them [the students] the tools that they need to get there. And that is exciting and fun.

Ms. Sims [00:26:57] I agree. But only if they know that's what it is.

Multiple voices [00:26:59] Right; Yeah; Exactly.

Ms. Sims [00:27:03] This is my first meeting and I showed up because I am nosey and because I want to be a better teacher.

Ms. Rayne [00:27:08] And I think you are also wanting to try new things and not be stuck in a mindset of just having done it this way of "I'm going to do it". (Ms. Noble "Yes"). Just being able to try something new.

Ms. Anderson [00:27:23] "We've always done it this way". I hate those words.

In this excerpt from CoLab Two, you can see Ms. Sims shifting from the periphery of the community to a deeper engagement, doing the work of imagination characterized by empathy as a facet of belonging to this community of practice. Her presence sparked a dynamic that included negotiation of the joint enterprise in which Ms. Sims described her perceptions of teachers' experience as part of a broader system shared by all present. This interchange also evidenced the

overlap of constellations, the institutional implications that seemed universal as Ms. Sims shared the experiences of teacher at the conference and the confluence of constellations of members that share the University STEM Teacher Network. Ms. Anderson's views were shaped by her experiences with the University STEM Teacher Network, a reflection of a shared repertoire in terms of shared historical events, with some of the people in the room and the impetus for the presence of many at that meeting. Ms. Sims continued to express herself, hitting on a point that drew agreement from multiple other teachers in the room. She then positioned herself within the group, stating she was new but then providing a reason why participating in this community of practice was important to her, which brought affirmations from Ms. Rayne and Ms. Anderson, who appreciated and saw value in what she was saying. Here we also begin to notice an identity shift in Ms. Rayne as she responds to Ms. Sims by acknowledging and pointing out that she sees Ms. Sims as someone willing to try something new. This illustrates the diversity of thought and experience, capturing in action the mechanisms of complementary contributions and overlapping competencies.

We see further evidence of the group coming together as a community later in the meeting when the teachers begin to negotiate their joint enterprise, which is "defined by the participants in the very process of doing it" (Wenger, 1998, p.77). The discussion had shifted to the proposed focus of our meetings and the general direction of the group. I had floated the idea of exploring classroom management strategies that support hands-on inquiry such as reflection journals, which are more consistent with RP.

> **Ms. Anderson** [00:40:46] You just set the purpose for this. Oh. That's it.
>
> **Ms. Blankmann** [00:40:50] What is it?
>
> **Ms. Anderson** [00:40:51] You just said it. Everything you just said. Because that's what we should be doing, is teaching these [restorative practices]. Because

> this is so much more than just in a classroom. I mean, this is life. And it's the more that they [students] can talk, observe, and relate and connect and understand their own worth, the better humans they're going to grow to be. So, you're gifting them their future. You make me want to cry?
>
> **Ms. Rayne** [00:41:26] She will.
>
> **Ms. Anderson** [00:41:27] (laughs) I know. I'm so sensitive.
>
> **Ms. Blankmann** [00:41:34] Alright. Thoughts on that. Somebody?
>
> **Ms. Judd** [00:41:39] I mean I see them bond in my room. You know that they want to engage. And they want to do the hands-on things. And they want to understand. If it's out of control, then we can't do it. It's not going to happen. The motivation is there. Some days that helps. Some days, I'll be honest, I'm like, nope. We've collected everything and this isn't happening today, but it is a motivating thing. They want to do the engaging activity.

Community maintenance as part of mutual engagement was itself the activity of exploring a shared vision and direction for our meetings. In this excerpt the group engages in the work of alignment as competing ideas are laid out, a joint enterprise collectively negotiated. The shared vision as a joint enterprise was (re)negotiated at every meeting as each member of the CoLab navigated the changes and shifts in their many constellations, professionally and personally.

In this way, the participation in the CoLab exposed some of the complications of constellations that do not simply move through/around each other but collide, surfacing the complexity of navigating intersectionality of their personal and professional worlds. Between April of 2022 and February of 2023, the teachers balanced their professional responsibilities with personal hurdles. Teachers over this period experienced serious illnesses, invisible disabilities, the loss of loved ones, their children getting ready to leave for college or changing schools, partners losing their jobs, finishing and starting doctoral programs, colleagues leaving, and by December the knowledge that each member of the

CoLab would be on Cobra for health insurance beginning in March and by June they would all be unemployed.

Surfacing Systemic Inequity Through Participation in the CoLab

The CoLab became a place for frank discussion of social justice issues, a space/place in which conversations about matters of (in)equity surfaced. By this I mean, that the requirements the teachers explicated as the negotiated norms and the context of the community of practice as professional learning exploring STEM/literacy integration, set the conditions for a space/place in which a comprehensive approach to RJE examining pedagogical choices and curricular decisions, as was recommended by Evans and Gregory (2020) in their review of RJE, became possible The safety of the community, the shared interest in exploring RP through STEM and literacy integration and the demands of broader constellations of communities we were navigating created fertile ground for very real conversations. Visible in the discussions were teacher thinking about matters of (in)equity as it pertains to lack of cultural relevance, cultural responsiveness, and lack of resources throughout the educational system. As an example, the CoLab planning meeting with Ms. Allen, Ms. Judd and Ms. Simon created a space for reflection on the cultural relevance of science for the students at BWES.

> **Ms. Judd** [00:28:45] We have a lot of kids that often say, “I like science”. That's because it's, you know, more engaging. But they don't necessarily think of, “I could do this for a living. Yeah, this could be a job”.

A few minutes later in this conversation Ms. Simon weighed in.

> **Ms. Simon** [00:30:55] I think with this population, we have to really keep in mind relevancy.
>
> **Ms. Blankmann** [00:31:02] I agree.
>
> **Ms. Simon** [00:31:03] Why is science relevant? Because you need to eat, right? You know what I mean? That sort of thing. Why is math relevant? Because you got to budget. You know, all of these things you have to look forward to tying it

> in. And that's what I'm, this is where I mean, at this point, I'm trying to figure out how to integrate it. I think I'm going to use this video where he's teaching his son certain terms with regards to investing and all that. And that's such a bigger picture. However, without knowing the ground, these, what we're doing now with place value. If you don't understand place value to the max, how are you going to [understand]? You know what I'm saying? How do you get to that point? And understanding, mastering math, you can now do something online with regards to making money because this population is not necessarily going to be able to go or want to go to school. School. There is not much relevance to them in school. So how can we show them [something] other than going into the system of school?

This exchange raises several systemic issues in education for students of Color. Ms. Judd begins by noting the disconnect between students engaging in science at school, even liking it, but not identifying science as an option for their future. Ms. Simon then points to the lack of relevancy for many students of Color, not just in the content at school, but the current school system itself. The effects that a lack of cultural relevance has on students comes to light in her sentiments in the conversation. She goes further to suggest the need to create another path for students of Color, one that is not part of the educational system at all. Barely detectable, but also present, is the modicum of essentialism, an instance in othering when referencing the population as "this population", indicative of the traditional structures of the educational system.

At the CoLab meeting in December, Ms. Allen was accompanied by her intern, James. Ms. Rayne and Ms. Juarez were also present, but the rest of the group were unable to come. This made room for a slightly different dynamic because of the range of experience in the room and the smaller more intimate group. Both Ms. Allen and Ms. Rayne left early leaving Ms. Juarez, James and myself chatting. The engineering challenge for this meeting was intended to be an activity to address the very high levels of stress the teachers were under due to changes schoolwide and within the district. Ms. Juarez and James were each given a bag of smooth round stones to build a wall or other structure with. The topic of leveraging literacy skills through science to support ESL students came up as we played with the rocks. Ms. Juarez shared an

anecdote about her family, voicing the lived experience for students that results from the lack of cultural responsiveness in our schools.

> **Ms. Juarez** [00:31:08] My nieces and my nephew recently came from Guatemala in April of this last year and started going to school this school year and they just started speaking English, like at home. So all these months they've been like mute at school, but they've just now started talking. When they got here, I was like, it's going to feel hard to be frustrated and you're not going to like it. But just give it till Christmas.

In response to a query about how the teachers were helping her nieces and nephew she replied:

> **Ms. Juarez** [00:32:26] I think when teachers try, like, they try really hard. They send all of their stuff home in Spanish. I went to pick them up from a field trip one day and the teacher was trying so hard to speak Spanish to them. So I think that they really try their best, to the best of their ability, especially considering they don't have an ESL teacher over at Springfield, so they don't have any ESL teacher there.

Through Ms. Juarez's candid story centered the reality of being a newcomer in an elementary school in which the ramifications of an under-resourced school left teachers unsupported and neglected the needs of the students they are supposed to serve, the systemic inequity of the broader educational system surfaced. Also exposed was the complexity teachers navigate when the constellations of their school and classroom community are in the shadow of the wider constellations that make up the institutions.

As the conversation continued James shared that culturally relevant pedagogy, culturally responsive pedagogy and matters of equity have been woven throughout his studies. He went on to speak to the training of teachers.

> **James** [00:32:57] But then I feel like when we try to take all those ideas and then put it into practice, what really happens is we fall right back into this assembly line industrial kind of status where we're really just trying to push everyone through. Even in, like, my educational program, they teach us all these methods, but they don't use any of the methods when they teach us.

The modeling of equitable pedagogy, despite the university's efforts to train pre-service teachers to be dexterous with equitable teaching practices, was not entirely visible to James and the tendency for teachers to fall back on traditional instructional strategies was evident in his comment. The conversation shifted to the treatment by the broader system of teachers that do implement equity focused practices, the teachers who are skilled, the teachers who are passionate and the repercussions of the lack of systemic support, including salary.

> **Ms. Juarez** [00:36:37] When I was in college, I was like, I am totally that martyr. I was like, I love this job and I love children. I would do anything, you know, because I'm passionate about it. And then I bought a house.
>
> **James** [00:41:35] It's so heartbreaking. Because like, you have teachers who come in here and then because it's so difficult, they leave. Right. And that's and then so what ends up happening? You end up getting not good teachers, right? Because this is, you know, the, you know, lower, I don't know what you want to call it.
>
> **Ms. Juarez** [00:41:57] It's the "take what you get".
>
> **James** [00:41:57] It's the "take what you get".
>
> **Ms. Juarez** [00:42:00] You need a body in the room.
>
> **James** [00:42:01] Yeah, exactly. So you get not great teachers…And so they get, because they're in this, you know, a Title One school, they get a lower quality education, which stacks up to less of a chance of finding a job or going to college, which stacks up to, um, more potential for poverty, which goes all the way back and brings the cycle all the way back around to their children. "Yeah, I'm in the same place". It just stinks.

Ms. Juarez and James talked through the racialized nature of the educational system. The space/place of the CoLab and the safety and support created conditions for members of the group to open up and thoughtfully surface in their discussions systemic inequity that exists when cultural relevance, cultural responsiveness and essential resources are not attended to.

In her interview Ms. Rayne noted a problem of practice that stemmed out of issues of cultural relevance and lack of resources. Ms. Rayne, during her interview, which occurred at the end of the pilot study, spoke to her frustration at not being able to meet her students' needs because of the systemic structures in place.

> **Ms. Rayne** (15:12) I just have to focus on what they need, sometimes I think teachers get caught up in the standard instead of how to make it work for the kid. I have so many different areas. What would you do? It's like a web. I'm in the middle and I'm branching off. Okay. This one needs this, and it's like I'm constantly, I can't stick to "this is what I'm going to do in this block". I have so many things I do in that one block to try to reach everybody.

Again, we hear voiced the challenges of a teacher navigating what she knows is best for her students being frustrated by the broader systems at play. In discussing social justice-oriented teaching, Nieto (2013) suggested that among the ways to challenge the status quo is through curriculum. The following journal entry suggested the idea that a place/space for teachers to share problems of practice can also become a context for candid conversations about being bound by the systems in our professional constellations that maintain the racialized status quo.

> I had a great conversation with Ms. Rayne today during her planning time. She is feeling like her hands are tied when it comes to meeting students' needs. We discussed different ways true integration might happen. We discussed a number of strategies. We decided on rearranging the schedule somewhat so I can use the morning meeting as a way of fine-tuning technical writing skills and wrapping science and ELA more tightly. Ms. Rayne has to put into Mastery Connect three activities she has done for each standard, further siloing disciplines. It is frustrating. We are going to work our way around it. We talked briefly about the fundamentally racist foundation of education that the system keeps reproducing. (Journal entry, 2/9/2022)

Ms. Rayne was concerned about three of her students, which she felt would benefit from another year in the same grade because of reading challenges they faced because of the lockdown due to COVID-19. However, policy prevented this decision from being in her hands even though she was advocating for what she felt was in her students' best interests. The mandated use of Mastery Connect created the next hurdle for Ms. Rayne to create curricula she felt would serve

her students best. Mastery Connect is platform for formative assessment tracking students' level of understanding of specific standards to inform instruction and plan interventions. Solving for how to use Mastery Connect while still integrating STEM and literacy opened the space for discussion about surveillance in the form of tracking and how this forces teachers to then not try to design for integrated learning and interfering with the opportunity for students to participate in more collaborative and experiential learning.

Opportunities for the teachers to reflect on their teaching practices were designed into the experiential learning process of the CoLab meeting structures. For example, During CoLab Two, in applying some of what we the discussed as part of our sense-making about shared vision, teachers reflected on how the launch of their school year was going by asking themselves: What am I doing well? What can I do better? How will I do it? Ms. Juarez shares her thoughts underneath her notice and wonder of the daffodil bulb (Figure 26). Here, the aspiration of improving hands on learning opportunities is expressed. As a follow up, she did in fact ask for me to work with her in establishing norms with her students for inquiry focused science lessons. As another example of how the CoLab becomes a site for exploration of the challenges of

Figure 26. Ms. Juarez's Notice and Wonder

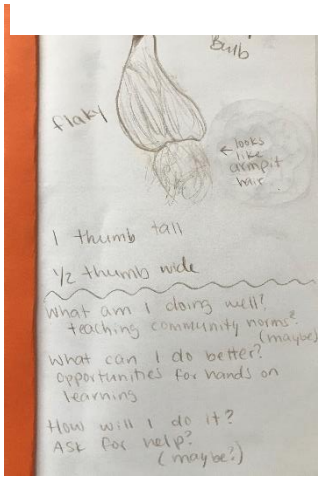
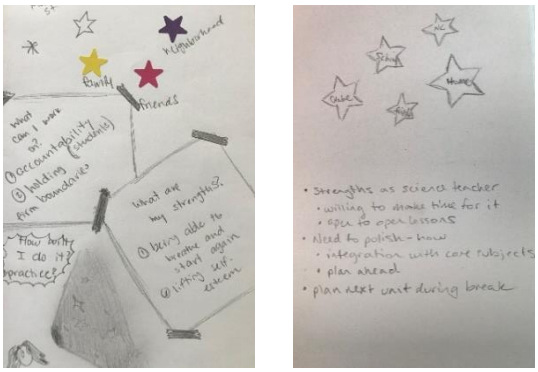


Figure 27. Ms. Juarez and Ms. Sim's Constellations



teaching science and the role teachers play in it. I explicitly asked teachers to consider their constellations. This was followed by a discussion about how the constellations impacted their science teaching. At the end teachers reflected on their strengths as a science teacher and what they want to polish. Figure 27 illustrates how the teachers were thinking about themselves as science teachers and how their constellations influence their science instruction. Ms. Sims sees her strengths as pushing back against the pressures of pacing guides and schedules dictated by the school, district and state by making time to ensure it happens in her room. She also realizes she needs to work on STEM/core subject integration if she is going to make that happen. Ms. Juarez speaks to her ability to navigate the frustrations through deep breathing and her ability to lift her students' self-esteem. The following interchange between Ms. Sims, Ms. Juarez, Ms. Judd, Ms. Noble and Ms. Rayne took place after the teachers had finished creating their constellations.

> **Ms. Blankmann** [00:12:06] Thoughts on our science teaching and how our communities, all of them, impact our science teaching?
>
> **Ms. Sims** [00:12:30] Different background knowledge is provided by each of them, and different demands are made, sort of informed. Like what do I feel that my students need to know? Based on what I know from my different areas.
>
> **Ms. Juarez** [00:12:47] That's what I was going to say. I am thinking about it, based on what you see and notice in your communities, what you're going to teach to your kids.

Ms. Judd [00:12:59] Yeah. I was thinking the same. It's how you prioritize what they need to know. What is important.

Blankmann [00:13:04] Yeah. I think also if you think about sort of your grade levels as communities too. And I know that's a varying state. I know Ms. Sims has told me that you're the only teacher science on your grade level grade that you do their planning for science. You have a different scenario because fifth grade gets tested. It shifts things a little bit. First grade, you know, functions more as a community in terms of your planning. So, there's a little more opportunity to collaborate. And then, you know, when you zoom out again and then how is the big picture stuff affecting us? I mean, what's that going to look like when this school returns to the county?

Ms. Sims [00:14:06] No more science below grade five. That is what that looks like in my experience.

Ms. Noble [00:14:11] I did it. When I was in Kindergarten I did it.

Ms. Juarez [00:14:11] We're trying.

Ms. Rayne [00:14:15] I did it.

Ms. Sims [00:14:16] In a testing grade? In like 3rd and 4th?

Ms. Rayne [00:14:18] In K through 2.

Ms. Sims [00:14:20] Okay.

Ms. Rayne [00:14:20] I mean, what are you talking about testing?

Ms. Sims [00:14:24] What I saw in third and fourth grade was that there was, they were not allowed to time to teach anything but reading and math. It's tested.

This interchange revealed how participating in the CoLab provided a space to think about how the constellations teachers move in impact science teaching, the influence of the mandated testing coming from the wider constellations, and the tenacity of teachers to try to negotiate all the constellations as the ebb, flow and collide.

Surfacing matters of (in)equity became possible within the context of *learning as belonging and doing* as part of the negotiated norms of the CoLab. As Dr. Jenkins calls them, these *courageous conversations* brought to light for scrutiny by the teachers the role of cultural

relevance, cultural responsiveness and resources or the lack of resources plays in the educational experiences of their students and the conundrums teachers are placed in when navigating colliding constellations. The community of practice as professional learning exploring STEM/literacy integration exposed some of the challenges of teachers feeling as though their hands tied, the essentialism that is so hard for teachers to shake off and negotiating the intersectionality of both personal and professional constellations.

Creating Space for RP Through the Integration of STEM and Literacy

The CoLab made visible the ways in which the integration of STEM and literacy can become a RP, operationalizing RP as *the proactive enactments of the community towards developing a sense of well-being for all the involved individuals through learning as belonging and doing*. The community of practice created a platform or venue for the participating teachers to share their successes; step into the role of mentors, leaders and experts; and engage in practice as learning about RP, SJE and integrated STEM/literacy.

Ms. Anderson taught in a school that did not engage in restorative practices, yet she voiced how integrating STEM and literacy can be a space of inclusion.

> **Ms. Anderson** [00:38:24] I know what I think. I'm in a different world so it's different, but I know what STEM and literacy and science integration does in my classroom. This is where they shine, this is where all [exaggerated the word *all*] of them are able to shine. Everybody. Because they're not, you know what I'm saying. Our readers are always going to do well. And our math people are always going to do well. But people that don't do well in those things, they are going to do well here. And when they are uplifted. They're not going to be angry or frustrated, well if we think about it, what do they need to be restored from? Well why are they angry and frustrated? Well because "I can't do the math and I can't do the reading".
>
> **Ms. Blankmann** [00:39:03] You're nodding.
>
> **Ms. Judd** [00:39:04] Yeah, I've had the same experience. And they all have life experiences. You know, that they bring to the table, and this helps bring that out.

During CoLab Two, Ms. Anderson and Ms. Judd shared their experiences with STEM/literacy integrated instruction. Ms. Anderson noted how it meets the needs of all her students and even presented students who otherwise did not feel as successful in school, a place where they can "shine" while addressing some of the frustrations of school that can impact learning. Ms. Judd's comment highlighted how integrating STEM and literacy creates an opportunity for students to engage with their funds of knowledge.

Likewise, in the following comment Ms. Allen spoke to the importance of fitting science into every school day and how that experience materializes a space/place students care about. Like the space/place Ms. Anderson and Ms. Judd were discussing, this is an example of how science becomes a place of belonging through learning and doing, a space/place students become invested in, an embodiment of RP as the proactive enactments of the community towards developing a sense of well-being for all involved individuals though learning as belonging and doing.

> **Ms. Allen** [00:03:55] And we have kids that I've heard literally could not handle holding pencils without throwing them and trying to launch them at other people in another space. Yet here they're holding this piece of mica like it's a baby because they really cared about the content…I have a student new to the school this year. He said, "No, we didn't really do science." And so, I know exactly what you're talking about because it's prevalent. It is not something always integrated into the curriculum. And, you know, that's one thing I was able to do here is push. It needs its own space.

When asked if a relationship existed between RP and STEM/literacy integration during the focus group, Ms. Juarez saw the relationship building aspect right away.

> **Ms. Juarez** [00:35:21] …There is integration because when you do STEM, you have to have all of the collaboration and the teamwork and building relationships with students and relationships between students, all that great stuff. And if you're trying to tie in literacy at the same time, then you're doing a STEM project on something you read in literature and you're using restorative practices to kind of facilitate that process.

Ms. Juarez alludes to RP as a means of creating the conditions for collaboration, using circles for productive science talks. Doing STEM creates a space/place for RP through the development and maintenance of relationships in order to do the work of the group. What she described was a community of practice in which students are participating in mutual engagement, joint enterprise, and negotiated repertoires of practice, thus becoming a space/place of well-being through learning and doing, by the definition used in this study, a RP.

During CoLab Two, the community began to discuss their shared vision, Ms. Allen suggested pairing younger and older classes in the school for science exploration.

Ms. Allen [00:30:50] I was thinking that like if we had science buddies. Just so there is that connection. You know, I'll say having that workday recently. It was so funny, I got to stop in and see Ms. Noble for a minute. She knows the kids that I have, and we could brainstorm some stuff and trouble some scenarios. It's just nice knowing. "Hey, I've got someone else that I can tap into that's a part of that kind of philosophy, that village philosophy."

Ms. Allen voiced the idea of connection through science, sharing how important having a colleague accessible was for her, a way of negotiating problems of practice, to "trouble some scenarios". Here the CoLab had become a space/place for learning as part of the work of imagination, that mode of belonging in which the possibility exists to create "images of the world and seeing the connection through time and space by extrapolating from our own experience" (Wenger, 1998, p. 173). During the focus group when asked how their ideas about STEM/literacy integration had shifted, Ms. Allen spoke up again speaking to inviting administrators in to see STEM collaboration between younger and older grades.

> **Ms. Allen** (00:40:46) But, you know that's one thing that Ms. Rayne and I, for this whole five-year cycle, have always found ways each year to pair up her Hummingbirds and my upper grade kiddos. It's a powerful thing. And the way you see the older kids kind of like adopt and take the little ones under their wings. It's just incredible. You know what you have. But I think that if anything, it's made me think about how important it is moving forward. Contact and say "Hey So and So, we're doing this why don't you come down and see it" to make that awareness of here are things that you can do to connect people. We're talking about better together here. Here's a true example of how we have done that

> and made that happen. And those are some of my fondest memories that I'm going to take with me.

Ms. Allen's sentiment again speaks to how the CoLab understood how the relationship between STEM/literacy integration and connecting people, reinforcing the idea of STEM/literacy integration as a site for *the proactive enactment of the community towards developing a sense of well-being for all involved individuals through learning as belonging and doing*, the very definition this work utilizes for RP.

Ms. Noble followed up by responding that for her she appreciated just learning more about how and why STEM/literacy integration was a useful teaching strategy. The following excerpt from my journal recounts one of those learning moments Ms. Noble and I shared with Ms. Rayne and Ms. Juarez while implementing the *What does a scientist do?* lesson we developed during the pilot the previous school year. In this excerpt, like the earlier instance with Ms. Simon referring to the students as "this population" notes of essentialism are baked in from years of working within the broader context of a racialized system. In this instance they e surfaced and addressed through the repertoires of practice being taken up by the teachers. Also, present was an opportunity for Ms. Rayne, having designed and implemented this unit last year, to take the mantle of teacher leader.

> I did a connected investigation with Ms. Juarez and Ms. Noble's class - *I can be a chromatographer like Dr. Gina Pressley*. The kids were practicing observations, data collection and science talk. Ms. Noble took up the water cup of an ELL student thinking it was in the way and the child couldn't do more with it. I asked her to please leave it because the little girl had noticed that the water changed color and was including that in her drawing. Some of the other children noticed the same thing, but it depended on the color of ink they used. The next day the grade level team and I were having a planning meeting. We were talking about the really great observations the kids made and the science talk that each of the classes had. Ms. Noble. said she was glad I had asked her to leave the little girl's materials. She said she had not considered other ways the child could express herself other than talking and writing. That was the first time she considered the importance of drawings, especially with ELL students. She said she was amazed at the girl's work and was glad she had the opportunity. I said something about building on each student's knowledge and ways of expressing themselves and Ms. Rayne jumped in

> with what she remembered from grad school about Funds of Knowledge and leveraging it. The teachers had a great discussion about how this showed up in our science lesson. Ms. Rayne shared how amazing her classes' development was last year through talking and writing. I need to start recording our conversations. They are so rich. (Journal entry, 10/6/22)

This excerpt surfaces several matters of (in)equity. First, to some degree, essentialism in even the most seasoned, astute, and caring of teachers is baked into attitudes and beliefs about students. There is an "othering" that is present. However, this also reflects how participation in the CoLab and the grade level team, a boundary overlap of constellations, that Ms. Noble was able to recognize she had learned something new and was pleased to roll it into her repertoire of practice that was shared through these communities of practice. Ms. Noble exemplified Nieto's (2013) assertion that an aspect of SJE is the teacher as a lifelong learner. Second, Ms. Rayne began to move into a space of expert. Wenger relates that identity formation has two components of the process, identification and negotiability which are fostered through the modes of belonging in a collective and the negotiation of meaning of significance in that space. Through engagement in a community of practice and individual can see the influence they have on/in the world. The interplay between negotiated meaning between members of the collective and having the one's ideas taken up by the collective foment identities of participation in a community of practice. With Ms. Rayne this particular phenomenon was made visible when she received the State Elementary Science Teacher of the Year award. This journal excerpt reflects on Ms. Rayne's thoughts about herself as a science teacher and how that shifted. She shares her idea with me of how we might proceed with the still very new CoLab.

> Yesterday Ms. Rayne received the Distinguished Elementary Science Teacher of the Year award. When she first told me about winning the award, she said she thought it was a joke. She said she never would have expected to be recognized for anything, especially science, and told me that working with me last spring made her a better science teacher and that she attributed the award to the work we did together.

> I went to support her during the awards ceremony. We went out to dinner. Our conversation was very good. Again, another one I probably should have recorded. We discussed a lot of things but among them was strategies for the rest of the school year and ways to engage her grade level teachers as well as the other teachers in our STEM Teaching and Learning CoLab. Ms. Rayne described an idea she had that really was very much a lesson study. Going into the next unit we are going to try to make that happen. The idea is we plan our storylines as a grade level, I will rotate through as a substitute so they can observe each other's teaching. We will come back together and debrief, adjust the next lesson according to our goals and how we met them when we were implementing the lesson. We also discussed centering equity and how to do that in a more explicit and intentional way. (Journal entry, 11/6/22)

Sadly, with CoLab Three a few weeks later, came the news about the dissolution of the university partnership and the school district. Despite the low morale of teachers at BWES, Ms. Judd, Ms. Rayne, Ms. Juarez, and Ms. Noble came to the meeting. This brief exchange shows how the CoLab had become a place of belonging for teachers through learning and doing. Focus on vexation ventures, that is collectively thinking about a problem of practice, served as a way processing through joint enterprise.

> **Ms. Judd** [00:19:33] I think it's just hard right now because there's a lot up in the air.
>
> **Ms. Blankmann** [00:19:38] Does it help just to have the meetings so that we can sort of process and do like vexation ventures?
>
> **Ms. Juarez** [00:19:51] I guess, I think it helps to know we are all on the same page.
>
> **Ms. Judd** [00:19:54] Yes.
>
> **Ms. Juarez** [00:19:54] A lot.
>
> **Ms. Judd** [00:19:55] Yes.

For the members of the CoLab it became a space/place for "negotiated response to their situation and thus belong[ed] to them in a profound sense, in spite of all the forces and influences that are beyond their control" (Wenger, 1998. p.77). For the teachers, who out the gate had been looking for a place of belonging, the CoLab became a space/place of RP *as the proactive*

enactments of the community towards developing a sense of well-being for all involved individuals through learning as belonging and doing.

Integrated Quantitative and Qualitative Data

The point of integration added clarity to the research question: In what ways does participation in a teacher community of practice focused on STEM and literacy integration serve as a mechanism to surface the racialized nature of the wider educational system? To answer this broader question, the integrated data reflected how a teacher's implementation of RP contributes to or troubles the reproduction of inequity. Four indicators of how teachers enact RP surfaced. First, the word *restorative* was associated with reactive enactments of RP. Second, the word *discipline* did not fit with the way teachers understood RP. Third, teachers understood RP as a proactive means of community building through positive relationships, inclusivity, and empowerment of students. Lastly, teachers used RP to repair harm.

Contributing to or Troubling the Reproduction of Inequity Through RP

From the quantitative and qualitative data three themes emerged that speak to how teacher's implementation of RP can contribute or trouble the reproduction of inequity: 1) repairing harm, 2) discipline, 3) and building community. The quantitative data reflected understandings and assumptions of the CoLab teachers as part of the broader school wide RP initiative while the qualitative data dug deeper into why teachers understood RP in these ways and how those interpretations informed implementation. By virtue of participation in the CoLab, a space/place for discussion about RP and SJE teachers were presented with the opportunity to think deeply and candidly about matters of (in)equity and their classrooms, shedding light on some of the complexity in implementing RP and the relationship of RP to STEM/literacy integration.

Repairing Harm. All twelve of the teachers responding to the survey said they used restorative practices for the purpose of conflict resolution regularly throughout the week, of which half of the teachers used it daily to address conflict. This complements the quantitative data that showed that teachers prioritized both proactive and reactive uses of RP. Repairing harm as a function of conflict resolution is reactive. Through the qualitative data the complexity of when and how RP was used becomes visible. The following interaction took place during the focus group when James, Ms. Judd, Ms. Allen, Ms. Juarez, and Ms. Sims were organizing sticky notes on their chart, ordering how they use RP. The sticky notes read: as a mechanism for community building, conflict resolution, discipline, classroom management and content learning.

> **James** [00:25:38] I feel like, I know but like, I feel like that's [building community] is what it [RP] is. Right? Where it's also preventative and all that, I feel like maybe calling it restorative practice assumes there's already been a problem because you're using the word restore. Restore, right?
>
> **Ms. Judd** [00:25:58] That's where it's derived from [points to community building].
>
> **James** [00:25:59] Yeah. I get it. But it almost, like, implies that there's something that already happened.

James expressed here how the language used suggested something needs to be fixed. His understanding was that RP was used in response to an event. Like James, Ms. Sims, who was new to the school, provided this definition of RP in November, which reflects her understanding of RP as repairing harm.

> **Ms. Sims** [00:29:54] I just view that [RP] as a different way of dealing with people's choices that, you know, there are some things you can't take back, but that doesn't mean you can't move forward. And we're all still going to move forward together. We're going to figure out how to get you back in the room or back in your seat or back to doing your work. You've torn up my bulletin board. What do we do to address that? How do we restore that and how do we, okay, we're having a fight. How do we fix and restore this relationship? How do we address what went on here and be

> able to move forward? I just view it as a way of moving forward without ignoring what happened.

Still trying to help James make sense of RP during the focus group in February, she had a more nuanced perspective.

> **Ms. Sims** [00:51:44] Now that you pointed it out, calling it restorative practice, because it comes from a social justice term, but because restorative practices is the larger umbrella of tools, but because it's sort of a branch off of that, they kept that name. But it does
>
> **Ms. Juarez** It is misleading.
>
> **Ms. Sims** but so you almost have to think about it, the way that I rectify it in my head, it's like it's the harm that's been done to us by the rest of the world. But we brought it to the room with us and that's what needs to be restored.
>
> **Ms. Judd** Yeah, but I think that's true.
>
> **James** [00:52:12] And so it is a little bit of a misnomer.
>
> **Ms. Sims** Yeah. Yeah. It's funny.

The semantics that complicate how RP are understood in the context of repairing harm and conflict resolution is evident here. These interchanges also suggested that what is being fixed are the students.

Discipline. Like the language around the use of the word restorative, the use of the word discipline confounds how RP is understood and implemented by some teachers. The quantitative data reflected the use of classroom management tools that maintain a power dynamic in the classroom between students and teacher in the teacher's favor. This fits with teachers identifying as more traditional in their instruction. The quantitative data highlighted the disconnect in viewing instructional styles that center community building, amplify all voices, and make room for counter narratives while also identifying as traditional. The qualitative data made visible the

ways in which teachers work to reconcile these contradictions between the way they identify as teachers and their enactment of RP.

The qualitative data clarified how teachers define traditional instruction. The focus group was succinct when asked how they interpreted traditional instruction.

> **Ms. Rayne** [00:07:40] Teacher. Teacher, teacher.
>
> **Ms. Blankmann** [00:07:42] Okay. Does that kind of sum it up for all of you?
>
> **Ms. Judd** [00:07:45] Teacher. teacher. teacher.

Ms. Judd during her interview over the summer had a broader definition.

> **Ms. Judd** [00:02:42] So traditional to me would be very didactic teacher upfront; instructing, students listening; students being the recipients, not necessarily active participants; maybe just taking notes, doing heartbeats. I feel like that's kind of old school traditional.

In contrast to a traditional instructional style, the focus group defined social-justice oriented instruction in a few words.

> **Ms. Noble** [00:07:54] Equity for all.
>
> **Ms. Juarez** [00:08:05] Teaching with and keeping in mind the barriers your students might be facing.

Their interviews expanded on what that looks like in action. Ms. Allen spoke to the broad systemic matters of equity.

> **Ms. Allen** [00:04:24] For me, that is an understanding of recognizing. It is us empowering children. Children already have a voice, and it is giving that equal opportunity for everyone. Regardless of your race, your gender, your sexuality. You are accepted regardless of your disability; physical, visible or invisible. And it's ever evolving as we learn how different people perceive or how the injustices over generations have impacted. Being cognizant of what we say and what we do. Because that shapes and influences our teaching.

Consistent with the quantitative data in which all the respondents agreed SJE is about differentiation, Ms. Sims spoke to the importance of meeting the needs of individual children through differentiated instruction.

> **Ms. Sims** [00:09:47] I think that that comes more back to the equity as opposed to the equality. Like everyone gets the skill and drill. But if you're teaching equitably, social justice wise, it's reaching the children. They need to be reached for. Like allowing them to express their learning in different ways. Like, "I can't write this, I could draw it instead" or "I could tell you about it, or I could make something else". There are times when they won't get to do that. But in the meantime, while they're learning and I need to know right now, are they getting it or not? Do they have to write it down? So how can we be equitable with that? Or if I'm teaching this percentage of the class understands that if I teach this way, but this percentage doesn't. So how do I address everybody differently? Or, you know, maybe I'll readdress this small group of this group of kids in a different way or reach out to them and like walk around the room while they're working or how do I put them in charge of their own learning, because then they'll be able to learn better. It just depends. They all have different learning styles. Every person is different.
>
> **Ms. Blankmann** [00:10:54] So what I'm hearing is its differentiation?
>
> **Ms. Sims** [00:10:58] Yeah.

While a traditional approach to teaching was considered very teacher centric, squaring with the teacher as the seat of power in the classroom and the use of classroom management tools like Class Dojo, token economies and clip charts (Manolev et al., 2019; Williamson, 2017); a social-justice approach centers the student's well-being.

When teachers were asked to prioritize the use of RP in the classroom, the quantitative data reflected that eleven of the twelve teachers used RP for discipline. The focus group surfaced some of the complications with the semantics of how RP and the word discipline are used together. Independent of each other, the two thinking groups that had formed had the same discussion about the use of discipline in RP. Ms. Allen, James

and Ms. Sims landed on the word consequences, instead of discipline because the word discipline connotes something punitive.

> **Ms. Allen** [00:20:56] Discipline. I'm having trouble.
>
> **James** [00:21:07] With the word discipline because you definitely use it when there's conflict.
>
> **Ms. Sims** [00:21:11] Behavior challenges.
>
> **James** [00:21:13] But I don't know, discipline implies that there's like a punishment, I think. (Ms. Sims - yes) And you don't really punish with restorative practices.
>
> **Ms. Sims** [00:21:23] I feel like you help them recognize consequences.
>
> **James** [00:21:26] Consequences.

Likewise, Ms. Rayne, Ms. Noble and Ms. Anderson arrived at the same conclusion. Ms. Noble made the case that if students understand the expectations, there is no need for discipline.

> **Ms. Anderson** [00:21:15] So, if they learn how to resolve their conflicts. That should
>
> **Ms. Rayne** [00:21:19] That should go on [here].
>
> **Ms. Noble** [00:21:19] But that's what I'm saying. It's like I don't even think that [points to discipline sticky note] has anything to do with it. But just keeping a room, I mean, understanding what's expected instead of kind of...
>
> **Ms. Rayne** [00:21:35] If you build the community with them and they sit down, they talk about, okay, we're in the hallway. We do this. So then you go back to them and say, okay, Superheroes do
>
> **Ms. Noble** [00:21:58] Oh, yeah. That's part of it, I guess, I think they got a little say. But I don't know about this one [pointing to discipline again] because, I mean, this one is like you're getting in trouble. I mean, this is gonna happen if. This is gonna happen, if, like, that's not why you use restorative practice.

When the whole group comes back together Ms. Noble speaks about the word discipline as suggesting something bad will happen.

> **Ms. Noble** [00:28:52] Same thing. Like it implies you're gonna get some. Something is going to happen to you if you do this.

The group continues with their sense-making eventually turning to the Social Discipline Window used by IIRP in the *Restorative Practices Handbook* (2009, 2018). No mention is made, however, of the title of the chart.

> **James** [00:29:28] I think that the way that I was taught, it [RP] is instead of discipline, right? You use restorative practice, but they're both to achieve, they're both to resolve conflict. But you use restorative practice to resolve conflict, instead of the discipline. Yes. Does that make sense? That's how I learned it.
>
> **Ms. Rayne** [00:29:56] That reminds me...What's the word for it?
>
> **Ms. Blankmann** [00:30:00] You're thinking about the square aren't you?
>
> **Ms. Rayne** [00:30:02] Yes. Punitive versus
>
> **Ms. Judd** [00:30:36] (Looks it up) Restorative, neglectful, permissive and punitive.
>
> **Ms. Allen** [00:30:38] Punitive.
>
> **Ms. Judd** [00:30:39] The four squares are (reading from her phone) punitive, restorative, neglectful, permissive.
>
> **Ms. Juarez** [00:30:47] So punitive versus restorative.

As 92% of the survey respondents said they used RP for discipline, the qualitative data suggests that this is because the word discipline for some was reconciled by interpreting the idea of discipline as consequences. Also, a source of confusion was the inconsistencies with the premise of RP and student management schoolwide and in the RP Community. Ms. Sims describes a harsh response to what appears to be a relatively minor infraction.

> **Ms. Sims** [00:54:20] Last week, while I was at the Restorative Practice conference, I had a student who was suspended for four days for saying a rude thing to a teacher…That seemed very extreme,

While the circumstances for this suspension were not clear, this type of exclusionary practice is not consistent with an RP approach. The conflation of behaviorist student

management systems with RP extends to the wider RP community. Ms. Noble and Ms. Sims describe a workshop they went to recently that was training teachers to create an in-school suspension (ISS) space and do restorative work in it. The workshop they describe was not sponsored by IIRP.

> **Ms. Noble** [00:53:07] Kind of like the things you were saying. It is more like, I did a workshop, we went to was more like ISS and you have an ISS area.
>
> **Ms. Sims** [00:53:14] Right.
>
> **Ms. Noble** [00:53:14] But there, they're doing their restorative practice.
>
> **Ms. Sims** [00:53:17] Yeah. Yeah. Because you do sometimes need to get the kid out of the room for them to be able to calm down.
>
> **Ms. Blankmann** [00:53:22] Doesn't that still feel a little like discipline even if it's more productive.
>
> **Ms. Sims** [00:53:28] It depends on, so like, I have a student who is very, very sensitive to everything that happens near him, he gets increasingly upset. And if he can't get out of the space for a few minutes, he can't calm down and even talk about it. Now he's gotten better about doing it, but I think that that's kind of the benefit is like it gives them a place to calm down. I don't think it needs to be the whole day
>
> **Ms. Noble** [00:53:54] Right. I think in different situations, depending on the severity of the actual event.

A space where a student can collect themselves is not the same thing as a space designed to remove them from the community until they have made amends. The restorative work the student was doing involved going through the RP questions for conflict resolution and drawing or creating a piece of art to express the answers. Those questions, however, require two or more parties to work. It is the repairing of a relationship. Here, there seems to be mixed messages about how conflict resolution is engaged in a restorative way. When students are excluded or isolated from the classroom or school community, it is an enactment of power.

Community Building. The qualitative data also elaborated on how teachers used RP as a classroom management tool through building community. RP was used to build community by four of the twelve survey respondents daily and the remaining eight used RP for this purpose two to three times a week. The qualitative data surfaced how teachers do this and why it is important. Ms. Judd spoke to students' need to feel safe in their school community and prioritized building relationships with and between the students, consistent with the survey data that unanimously reflected as the most important teaching practice, building relationships with students.

> **Ms. Judd** [00:15:21] I just feel like. Especially in this environment, although probably honestly, given COVID and all the concerns related to that, I just feel like from day one, building those relationships is critical to anything else being successful, you know, and. They need to be safe. You need to feel safe. And I just feel like that opens the doors for everything else that comes. So I feel like. Feeling that safety with the teacher and the adult in the room, knowing that we are going to keep everyone's needs in mind. Trusting building that relationship with us is going to then lead to us helping them facilitate the relationships among each other.

Ms. Allen connects the use of RP to building relationships as key to building community.

> **Ms. Allen** [00:22:20] I think one way to describe it [that] is kind of neat is to talk about what it's not to know what it is. It is not a character of the month and we're studying you know, that can be a part of it we're studying citizenship, this, that and the other. It is not just a set curriculum. It is a thought of practice. So restorative practice is not just a discipline tool either, you know, it is a relationship builder and maintainer. And it's a wonderful way for students to see themselves as someone in the community that influences what happens in their community.

Ms. Allen describes what RP is not in order to clarify what it is. It is not a character development, curriculum or disciplinary tool. It is a "relationship builder and maintainer" which she sees as being part of a community. The complexity of the relationship between RP, building community and where discipline and repairing harm fit in comes through in how Ms. Juarez organized the ways RP is prioritized using the card sort during her interview.

> **Ms. Juarez** [00:17:56] So I put as a mechanism to build community I believe that that is the intention of restorative practices, building community by allowing

> students to have the space to create relationships and safely, if harm is happening to anybody, restore that. And then underneath that, I put conflict resolution and discipline together because I feel they go hand in hand when students resolve their conflict. It is a form of discipline. It is when they're resolving that conflict, they are taking ownership of their actions and they are really becoming aware that their actions have an effect on other people, which is big for this age group. And then underneath that I put it as a mechanism for classroom management and content learning, because without classroom management you cannot have content learning and it does sometimes help. If they have a relationship with each other or relationship with the teacher, they are more inclined to be nice to each other and the teacher because they recognize you as a person rather than just this person that is this authority figure in charge of everyone.
>
> **Ms. Blankmann** [00:19:33] Okay, so what do you mean by that? Authority figure. So, does that mean then, that you begin to create a space in which they see you as part of the community as opposed to separate from the community?
>
> **Ms. Juarez** [00:19:49] I think so. And when it's done correctly and you build these relationships between the teacher and the students and students and students together, I believe that it becomes "we are a community" rather than "it's the teacher versus us".

In this statement Ms. Juarez made the distinction between empowered students and teacher in power, viewing conflict resolution and discipline as interactions owned by the students, but the responsibility for facilitating and stewarding the community belonging to the teacher. In doing so, the teacher positions themselves as part of the community. Through the integration of the quantitative and qualitative data, the complexity of SJE and implementing RP initiatives became discernable.

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CHAPTER V: DISCUSSION

Discussion

Summary of the Findings

This study investigated the ways in which RP advances or perturbs the reproduction of inequity by examining how teachers understand SJE and RP through a community of practice focused on STEM and literacy integration and sought to make visible some of the mechanics in place that support and maintain the racialized nature of the U.S. educational system. Through a mixed methods approach to PDR, the quantitative data reflected how teachers at BWES understood RP and SJE while the qualitative data examined how a STEM focused community of practice for teachers can center equity. When considered together, the integrated data gave some insight into how such a community of practice can be used as a mechanism for surfacing the racialized nature of the wider educational system and ways in which teachers' implementation of RP may contribute to or trouble reproductions of inequity.

The quantitative data found: 1) Teachers understood SJE addresses a racialized educational system through facilitation of learning communities that nurture the well-being of all students; 2) RP used to repair harm and build community were equally prioritized. The BWES teachers view of SJE was consistent with the definition Rodriguez's (2016) Social Justice is the enactment of *"practices to promote diversity and equity".* They also viewed Evan's and Vaandering's definition of RJE "*Facilitating learning communities that nurture the capacity of people to engage with one another and their environment in a manner that supports and respects the inherent dignity and worth of all"* (p. 8) as a way of defining SJE. Both definitions are proactive, they are positive enactments. Restorative justice is described by IIRP as proactive with emphasis on community building through restorative circles and affirmative language, as well as

reactive in response to wrongdoing (Wachtel, 2016; Costello et al., 2018). Restorative practices can be in response to something, but also leverages social interactions that precede a negative event, those are proactive embodiments of RP to obviate conflict or wrongdoing (Wachtel, 2016). This is consistent with the interpretation of RP by teachers at BWES, prioritizing both reactive and proactive implementation.

The quantitative data also revealed tension between the existing educational infrastructure that is traditional and a SJE orientation when implementing a RP initiative. Of the teachers who responded to the survey, 58% of them identified their teaching style as traditional, while 50% of them saw their instruction as social-justice oriented. Teachers in the CoLab clarified for us through interviews and the focus group that they defined traditional instruction as teacher centered and test driven. In contrast, social-justice oriented teaching was equity focused, leveraged funds of knowledge and amplified voices. Teachers hierarchized building relationships with and between students as requirements for being able to teach. Yet, a disconnect between the value placed on relationships and the use of classroom management tools that are inherently filled with power differentials came to light (Williamson, 2017). Lustick (2017) notes that surveillance and monitoring of students has foundations in zero tolerance policies and will not be disrupted by a shift in the form of "discipline" (p. 1275) unless implementation is done with a "critical eye toward reversing the traditional notions of control and order that have always been an integral part of how public schools, as institutions, operated, that is, through systematic monitoring and sequestration of anyone whose habits do not cohere with what is considered "acceptable" school behavior" (p.1276). Gregory and Evans (2020), in recommendations for moving forward, state key principles of RJE include "confronting hierarchical and authoritarian

systems that instill attitudes of obedience and conformity" (p. 8). At BWES, the struggle between the traditional institution of control and a relationship centered community was evident.

The qualitative data examined how a community of practice focused on the integration of STEM and literacy can center equity and surfaced two findings: 1) A teacher community of practice focused on STEM and literacy integration can become a space/place for candid discussions centering equity. 2) STEM and literacy integration has the potential to be a proactive enactment of RP. The qualitative data suggested ways in which spaces/places can emerge that make room for straight forward discussions about matters of (in)equity. The community of practice that coalesced around STEM and literacy integration at BWES became a space/place in which teachers spoke about the weighty issues of cultural relevance, cultural responsiveness and resources. The CoLab provided a location for teachers to explore and experience STEM and literacy integration, reflect on the positive impact such an experience has on a learner and through a process of collective sense-making relate such instruction to RP. The CoLab, as both the design and the product of this research, became a site of belonging through learning and doing, the very definition of RP in this study. Through opportunities for mutual engagement, negotiated joint enterprise and repertoires of practice, the CoLab surfaced how integrated STEM and literacy can become a space/place of inclusion, fostering in students care for and responsibility to community, thus becoming itself a site for relationship building. The CoLab demonstrated Wenger's principles of learning as part of a community of practice. The social setting for learning provided space/place for negotiated meaning making, a relational dance between participation and reification. Restorative Justice in Education works to "transform schools from rule-based institutions to relationship-based communities…moving from systems of social control to systems of social engagement" (Gregory & Evans, 2020, p.8).

The examination of three recurring themes across the data; repairing harm, discipline and building community suggested that 1) The use of the word *restorative* is associated with reactive enactments 2) The word *discipline* does not fit with the way teachers understood RP. 3) Teachers understood RP as the proactive enactments of community building through the development and stewardship of positive relationships, inclusivity, and empowerment of students. 4) Additionally, teachers understood RP as repairing harm.

When integrated the quantitative and qualitative data addressed how RP can trouble or reproduce inequity, making visible how the semantics around *repairing harm* and *discipline* and even the word *restorative* itself can foreground reactive use of RP. James pointed out that the word *restorative* suggests that something has already happened. To that point, repairing harm was also understood to be reactive. When trying to help James understand RP, Ms. Allen defined it as, "Whole body listening, that goes into restorative practices. I guess, like the highlight that they try to put on it, or we try to put on it, is that when harm happens, someone speaks out of turn or someone calls somebody else a name, that there is a way for them to repair that harm", supporting the notion that RP is understood primarily as repairing harm. Likewise, the use of the word *discipline* confused the participants. While only one survey respondent said they never use RP for discipline all other respondents did. Members of the CoLab floated a variety of ways discipline could be understood. Ms. Noble stated that the word suggests something bad is going to happen to the individual. James equated discipline with punishment. In the end, both of the thinking groups in the focus group replaced the word discipline with consequences. Fomenting further confusion about discipline/consequences was the recent workshop the teachers went to which introduced, what the teachers understood to be, an ISS area to do restorative work. The

integrated data made clear teachers' understanding of the proactive use of community building in RP. Less clear was how community is nurtured.

Looking through a CRT lens made visible some of the confusion obfuscating how RP is implemented. Beechwood decided to adopt RP for its social-justice orientation. The use of RP reactively, without the community in place is part of the challenge and makes the success of the initiative less viable. Restorative practices when used as a tool for managing and controlling students can contribute to power dynamics that are in opposition to a Social Justice agenda.

This study brought to light how difficult it is to replace one way of being a community with another. Behavioral management approaches like token economies, clip charts and Class Dojo, are counter to RP. They are tools to maintain the power dynamic in which the adult is the overarching authority (Williamson, 2017). Token economies are a token-based rewards system grounded in the idea of operant conditioning (Doll et al., 2013). Forms of operant conditioning draw on B.F. Skinner's work in Behaviorism in which behavior is manipulated by rewards and punishments for desired outcomes (Schunk, 2016). In a token economy, neutral tokens, such as points, are awarded in advance or are alongside reinforcing stimuli that might include treats or privileges gaining traction in the behavior modification process as the neutral token shifts to become a secondary reinforcer (Doll et al., 2013). Clip charts, another behavior management system, publicly tracks student behavior on a tangible chart, while Class Dojo does the same digitally. With clip charts students' clips are moved from a central position, a 'ready to learn' block, either up or down. Moving up indicates students are outstanding or using model behavior, while moving down reminds the student that they need to make better choices or, at the bottom of the chart, parents are involved, often with home-based rewards and punishments (Krach et al., 2016). Class Dojo is a free computer-based method of a clip chart in which students are

represented by little avatar monsters in which the teacher can award or take away points. There are sounds that indicate a positive or negative point, which can be turned off, if not is again a very public tracking of behavior. Criticism of these systems point to their use as shame-based tools (Krach et al., 2016). Feelings of shame are often accompanied with a sense of worthlessness and powerlessness (Goodman, 2017) and runs contrary to the very idea of RP. Additionally, the controlling premise for using behavior management charts and token economies creates a space in which power dynamics are at the core of the classroom culture and runs in opposition to the idea of relationship-based communities.

Ms. Juarez very eloquently articulated how community building that positions the teacher as part of the community, rather than an authority figure creates a space/place where using RP to repair harm becomes a possibility. Confusion occurs in implementation when the collective, the school, the district, the U.S. educational system remains a power-based system. Use of exclusionary and power-based practices such as being sent out of the room, ISS, suspension and surveillance strategies like Class Dojo compete with building a community because it inhibits members from fully participating in the community (Lustick, 2017; Williamson, 2017).

The CoLab became a space/place for teachers to explore their instructional approaches and problems of practice more deeply. Ms. Noble shared how working with the CoLab helped her in her shift between grade levels.

> **Ms. Noble** [00:42:36] I was going to say for me just moving up to the first grade and working with you [Ms. Blankmann] and then Ms. Rayne as well, just learning more about integration. It was easier in kindergarten. I never had to really focus on it. Easy in kindergarten. I'm always managed ahead of time. I got to this grade, with so much phonics things that I didn't know I was going to be teaching. I had to change my way of thinking to make sure I integrated it.

Ms. Judd voiced how discussing STEM and literacy integration prompted her to go back to rethink some of how she approached her lessons.

> **Ms. Judd** [00:43:02] I find myself going to my bookshelves more. You know, when I'm teaching science, like, you know, what literature can support some of these [science] ideas. Present it in a different way. A different perspective. Yeah.

Additionally, the CoLab became a location for frank discussions about (in)equity, STEM/literacy integration and instructional practices. Teacher and institutional historicity were made visible through the CRT lens of intersectionality and essentialism, where voice and counternarratives were amplified. Evident in our talks, teachers' lived experiences came through as learners and educators nurturing a space/place for teachers' intersectionality to be voiced. As an example, Ms. Allen shared what it meant to her to see herself, even as an adult, reflected in a children's picture book.

> **Ms. Allen** [00:18:49] I also think a big piece of it, on a lighter note, is the instructional resources we are using. Books that have children that represent different types of backgrounds. I have a book on my shelf. We were allowed to purchase some different multicultural books and I actually found some that had Filipino children like my mom and her half of me. And when I ordered it, it was during the pandemic, and when it came in, I actually cried because it was the first time, I had seen a child portrayed that looks like me, that was proud of the ancestry that cooked the same dishes that my mom cooked in.

Ms. Simon's background made ideas about the meaning of traditional more concrete and also shared with the group insight into how her perspectives on school came to be.

> **Ms. Simon** (00:31): I was educated in Trinidad until twelve, so it's under that British system and it's just a little bit different. It was more, I don't know what the term I'm looking for, but it was, we had a lot of, it was a lot of corporal punishment, you know, you had to, you didn't have a choice you had to study, you had to practice, you know, let's say multiplication facts as a skill you had to study once you had assignments and once your assignments or assessments were given. And if you didn't do well, if you weren't participating, it all came with a price of being you know, beaten. So, well, because of my, my background traditional would mean that, you know, the child comes in, sits, gives them the information, expecting for them to pay attention, expecting for them to be able to regurgitate for want of a better term what's given to them, then assess.

Deborah Britzman (2009) writes about teaching as an impossible profession because "education will reference both procedures and unaccountable affects, the registration of education, more often than not, is dissociated from the very thought of education. And nowhere

is this problem more poignant than when brought to consideration of the teacher's world that educates, as she or he is educated" (p.3). In Ms. Simon's and Ms. Allen's comments, the intersection of the constellations of communities, and historicity of teachers and the institution evidence education as an impossible profession in that intersectionality and histories are always present. Integrated STEM/literacy as a space/place for voice and counter narratives is supported by Ms. Anderson's thoughts on an integrated STEM/literacy classroom being a place for all her students to "shine". She touched on STEM exploration making room for students who see and move through the world differently, highlighting this space/place for a student to write a counter narrative of their story, in keeping with Basile's (2021) decriminalizing practices honoring space, assuming brilliance and positive reframing. Her comments clarify the role integrated STEM and literacy can play in amplifying quiet voices and finding a home for more wiggly students.

The CoLab as a community of practice brought into focus where essentialism could exist despite best intentions, but through thoughtful implementation of RP can also be avoided. Noguera & Syeed (2021), note that alternative zero tolerance discipline cultures, through focus on socio-emotional well-being run the risk of defining students by the harm that has occurred to their communities and as part of their histories. When interviewed, Ms. Noble shared her insights by connecting the use of Social Emotional Learning (SEL) picture books in restorative circles that aid the students in thinking about how to solve social problems.

> **Ms. Blankmann** [00:17:08] So would you say that restorative practices in your classroom are in response to things or are used proactively? Or is there a combination there?
>
> **Ms. Noble** [00:17:22] A combination. Because definitely. The second step [referring to SEL] is I feel like that's what I share with Dr. Jenkins, it's a conversation starter. Some of the pictures you see or some of the things [referring to content in picture books]. And then we try to say, okay, what has happened in here? That's kind of like that or what have we done that kind of solves the same problem that they had. So that's definitely being proactive. There sometimes is,

> you know, when something has happened, we're going to start having to solve it and just coming back together as a community to say, what are we going to do next time to make it better?

Her understanding of circles did not at any point isolate, exclude or single out a child or their actions or behaviors as part of a community. Solving problems was done collectively. In this instance, SEL used as a proactive tool for RP, focused not on oppressive personal stories of an individual child, but on collective well-being.

Limitations

This study was modest in scope. Limitations include sample size of the quantitative data, the duration of the study and challenges to generalizability. The sample size of the quantitative data was sufficient for descriptive purposes. While the core group of CoLab teachers responded, the study would have been more robust if a greater number of the BWES classroom teachers had participated in the survey. If there had been more participation from the wider school community, there would have been a greater possibility of statistically demonstrating a difference between the CoLab members and those who did not participate in their understanding of RP and SJE. This would have given some insight into a possible relationship between their ideas and participation in the CoLab.

The duration of the study was informed by situation. However, had data collection continued for the full school year, this might have produced greater evidence of shifts in teachers' views on RP, classroom management strategies and STEM and literacy integration. A longer study would also have provided the opportunity to observe further changes in CoLab participation and the constellations of practice the CoLab teachers moved in/through/with.

This study hinged on the relationships that existed prior to the inception of the research project. In participatory design, it is essential that relationships, historicity of participants, and

power dynamics be attended to (Bang & Vossoughi, 2016). To do so requires time for the research to swell up from the context. This makes generalizability tricky because of the situated nature of the design.

Implications and Recommendations for Research

As this project was both process and product, to understand the relative significance of the surfaced findings it is necessary to revisit the way in which CRT and SPT framed this study. This work was a modest response to Tichavakunda's (2019) call for research that explored the intersection between CRT and theories of practice. Through a wide CRT lens, the direction of this work was viewed embracing the assumptions that racism is not a rarity or irregularity, but an ordinary part of the U.S. educational system. Race, in and of itself, is a social construct. Within the broader constellation of this racialized system, members of the CoLab are products of and function professionally within the racialized state system, likewise the district and BWES. Social practice theory kept the institutional struggle with (in)equity centered. The lens of intersectionality and essentialism brought into focus how the members of the CoLab orient themselves in each of these constellations through their historicity. Viewed through Wenger's (1998) conceptualization of Communities of Practice, the overlap of the CoLab and teacher's historicity through practice as meaning, community, learning, boundary, and locality create a space/place for voice and counter narrative. The CoLab became a context for belonging through mutual engagement, ongoing negotiated enterprise and repertoires of practice. As a facet of both identity formation and learning, belonging emerges through doing the work of engagement, imagination and alignment with/in the community. It is in and through this place of belonging that learning occurs as ongoing negotiated meaning making. Involvement in a community of practice made room for learning as a function of the harmonizing of the CoLab's enterprises with

a teacher's worldview. The possibility for learning came into being when teachers did the work of imagination through experience, reflection, and collective sensemaking. The CoLab became a space/place for learning through alignment of members as they worked to integrate perspectives and ways to address the shared vision and purpose of the community. The CRT and SPT lenses together maintained cognizance of the interplay between localized practice and as part of the broader context that ultimately defined the CoLab as a community of practice. Wenger (1998) asserted that "practice and identity constitute forms of social and historical continuity and discontinuity that are neither as broad as sociohistorical structure on a grand scale nor as fleeting as the experience, action, and interaction of the moment" (p.13). In bringing together these two theoretical perspectives, some of the complexity of systemic inequity was made visible, exposing deeply entrenched mechanisms for maintaining the status quo and potential tools for doing things a different way.

In response to Booker and Goldman's (2016) principles to inform future research, this study strove to add to the body of literature that models how PDR shares the space of learner and expert through ongoing collaboration with partners, responsiveness in design and examination of the phenomenon through an asset lens. Future studies might consider expanding on the theoretical synthesis of CRT and SPT through mixed methods social-justice participatory design as a means of addressing the nuanced and complex social dilemmas that are so deeply ingrained in matters of (in)equity.

Implications and Recommendations for Teacher Learning

Mockler (2011) called for professional learning that deepens teacher practice by building on their existing knowledge, engaging in inquiry and collaboration. The embedded professional learning at BWES created a space/place through the experiential learning process of experience,

reflection, sense-making, and application. Through engagement with topics of equity situated within a STEM/literacy integration exploration, the CoLab modeled the possibilities for communities of practice to be robust space/place for teacher learning. The emergence of the CoLab as a community of practice was responsive to the needs and interests of the teachers as well as conducive to teacher learning through negotiated meaning making. While rare, such communities of practice, that are thoroughly embedded, support the possibility for sustainability of a culture of professional learning and collaboration with/for teachers (Admiraal et al., 2021). Research increasingly demonstrates teachers' professional identity development through ongoing negotiation because of boundary crossing (Daza et al., 2021). Designing a space for teacher learning, like the CoLab, considers the complexity of "crossing and re-crossing, negotiating and re-negotiating, professional and personal boundaries between different but closely connected sites of professional practice" (Williams, 2014, p.3). A space/place can emerge when experiences and conditions are intentionally designed to leverage and amplify the unique qualities of each individual in a shared space, to bring together, generate and amalgamate ideas that speak to and are concentrated on a common vision, direction, or goal. Gee (2015) conceived of Discourse as "ways of being 'people like us'. They are 'ways of being in the world'. They are 'forms of life'. They are socially situated identities. They are, thus, always and everywhere social products of social histories." (p. 4). Critical to the design of the CoLab, was a Discourse that coalesced as a community through the intentional consideration of engagement, imagination and alignment that utilized the inherent social and collaborative space/place that emerges when STEM and literacy are integrated. Communities of practice that are deeply embedded have value in providing space for exploration of practice. Future research in professional learning for educators might consider conceptualizing ways of fostering communities of practice through STEM and literacy

integration that present teachers with opportunities that are inquiry-based, provide opportunities for collective engagement in meaning making around problems of practice, and intentionally center equity.

Implications and Recommendations for Restorative Practice Initiatives

The findings in this study suggest restorative practices as a means of building community through learning and doing becomes possible when engaged proactively; and when RP is reactive, without the conditions of a community being in place, success is less tenable. Maynard and Weinstein (2019) introduce their book *Hacking School Discipline* by highlighting the disproportionality of discipline policies in the American educational system, noting zero tolerance policies that routinely target students of Color. IIRP's states that RP "helps to reduce crime, violence, and bullying; improve human behavior; strengthen civil society; provide effective leadership; restore relationships; and repair harm" (Wachtel, 2016, p. 1). Focus on repairing harm and conflict resolution is part of a restorative approach. However, this study points to the possibility that helping teachers build robust communities first, might eliminate some of the confusion when beginning to implement a RP initiative. A community of practice focused on STEM and literacy integration, like the CoLab, models ways of building community in the classroom with students through the content being taught, not as a separate instructional space, but an integrated one. Thinking of building relationships beyond circles and affirmational word choices, the discursive nature of STEM and literacy integration in combination with the collective problem solving through exploration, reflection and sense-making creates space/place for collaboration and innovation, providing a way to support and build on proactive RP measures.

This study also suggests that RP as a disciplinary approach struggles to free itself from the language of control and compliance. Maynard and Weinstein (2019) view an educator's role is to "teach learners how to behave" advocating "for responsible and caring discipline" (p. 13). This is in keeping with IIRP's discipline window as a tool for educators to use when implementing RP. The use of the words *control* and *discipline,* however, are not in keeping with RJE values distancing schools from being "rule-based institutions" and "systems of social control" and does not embody a commitment to "disrupt oppressive structures and systems" (Gregory & Evans, 2020, p.8). This research captures some of the challenges in shifting a racialized educational system to social-justice orientation and illustrates "how a language of dominance which perpetuates hegemonic environments has taken precedence over the intended desire to strengthen relationships" (Vaandering, 2013). In light of the findings from this study a possible recommendation for the RJE community is to design RP professional learning for teachers that foregrounds community building which goes beyond circles and affirmative language, reinventing classrooms as space/places of community through STEM and literacy integration. Another recommendation is to reconsider the use of hegemonic Discourses and move towards language that truly embodies the values of RJE.

Audre Lorde (2003) noted, "the master's tools will never dismantle the master's house" (p. 99) meaning, change is unattainable unless we conceive of an entirely new set of tools. For RP to gain traction, for RP to address RJE the values of SJE must be evident. Moving to relation-based communities requires the shedding of all the tools of social control, instead creating spaces of belonging, shared spaces that Ms. Juarez spoke of and are echoed in and illustrated by Ms. Allen's anecdote.

> **Ms. Allen 16:34** I was sharing with some folks as I just came in. So, to kick off our forces and motions unit today. It was phenomenal. I was just walking around

> my room. Sometimes in the beginning of the year, especially, there are situations where they were still striving to make those good choices in the community and all of a sudden, they just came together today. One of the boys from a group…got in watching what the girls were doing. They had taken a long meter stick and some different containers and matchbox cars to make it land a certain way. And they put a bucket underneath to catch where it was typically falling. They took one of my cushy erasers so if it did fall it landed softly. Like this was all self-driven, self-initiative. The guy in the other group goes, "Wow. You all have inspired me." And hearing that from my kiddoes. It just warmed my heart so much. And then, sometimes they struggle with that ownership of the classroom…So it's possible and so Dr. Jenkins talks about seeds planted all the time. Now we don't always see that result all the time. The next day, the next minute, the week. But it's there. As my brother has taught me. Magnify the good. So that's right there even if we have some tough moments. That is going to be enough to drive me and inspire me when things are tricky and tough. Well, that was just wonderful to actually see that unfold today. That's pretty, pretty amazing.

This excerpt, characterized by the sharing of a story from the day, illustrates a level of belonging to the CoLab through the work of imagination. It is layered with reflections of the constellations Ms. Allen moves in and through - family, leadership in the school, her classroom community, her own personal needs. Her thoughts also illustrate how the belonging she feels in her community of practice is mirrored in the learning community she nurtured through STEM and literacy integration. These final thoughts support the representation of RP as *the proactive enactments of the community towards developing a sense of well-being for all the involved individuals through learning as belonging and doing*. It captures the possibility of STEM and literacy integration as a site for RP in the service of SJE.

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APPENDIX A: STATE TEACHER WORKING CONDITIONS SURVEYS

Table 5. Appendix A-Table A1

Teacher Working Conditions Surveys

Q5.1 Please rate how strongly you agree or disagree with the following statements about managing student conduct in your school.

c. Policies and procedures about student conduct are clearly understood by the faculty.

	2018	2020	2022
Strongly disagree	0.00	26.32	11.11
Disagree	30.30	21.05	51.85
Agree	39.39	42.11	33.33
Strongly agree	30.30	10.53	3.70
Don't know	0.00	0.00	0.00

Table 6. Appendix A - Table A2

Teacher Working Conditions Surveys

Q5.1 Please rate how strongly you agree or disagree with the following statements about managing student conduct in your school.

b. Students at this school follow rules of conduct.

	2018	2020	2022
Strongly disagree	30.30	42.11	25.93
Disagree	45.45	36.84	44.44
Agree	18.18	21.05	29.63
Strongly agree	6.06	0.00	0.00
Don't know	0.00	0.00	0.00

Table 7. Appendix A - Table A3

Teacher Working Conditions Surveys

Q6.2 Please indicate the role (teachers)["Teachers" means a majority of teachers in your school.] have at your school in each of the following areas:
e. Establishing student discipline procedures

	2018	2020	2022
No role at all	9.09	10.53	18.52
Small role	12.12	47.37	33.33
Moderate role	48.48	26.32	25.93
Large role	30.30	15.79	14.81
Don’t know	0.00	0.00	7.41

Table 8. Appendix A - Table A4

NC Teacher Working Conditions Surveys

Q7.1 Please rate how strongly you agree or disagree with statements about leadership in your school.
a. The faculty and staff have a shared vision (2018).
h. The faculty and staff have a shared vision. (2020, 2022)

	2018	2020	2022
Strongly disagree	3.03	10.53	11.11
Disagree	12.12	10.53	18.52
Agree	51.52	73.68	62.96
Strongly agree	30.30	5.26	0.00
Don’t know	3.03	0.00	7.41

Table 9. Appendix A - Table A5

Teacher Working Conditions Surveys

Q7.1 Please rate how strongly you agree or disagree with statements about leadership in your school.
b. There is an atmosphere of trust and mutual respect in this school (2018).
a. There is an atmosphere of trust and mutual respect in this school (2020, 2022).

	2018	**2020**	**2022**
Strongly disagree	6.06	5.26	14.81
Disagree	15.15	21.05	25.93
Agree	54.55	57.89	48.15
Strongly agree	24.24	10.53	7.41
Don't know	0.00	5.26	3.7

Table 10. Appendix A - Table A6

Teacher Working Conditions Surveys

Q2.2 In an AVERAGE WEEK, how much time do you devote to the following activities during the school day (i.e., time for which you are under contract to be at the school)?
b. Collaborative planning (time)[Collaborative time includes time spent working with other teachers within or across grade and subject areas as part of a Professional Learning Community to plan and assess instructional strategies.]

	2018	2020	2022
None	7.14	5.26	3.7
Less than or equal to 1 hour	21.43	15.79	51.85
More than 1 hour but less than or equal to 3 hours	46.43	52.63	33.33
More than 3 hours but less than or equal to 5 hours	25	26.32	11.11
More than 5 hours but less than or equal to 10 hours	0.00	0.00	0.00
More than 10 hours	0.00	0.00	0.00

Table 11. Appendix A - Table A7

Teacher Working Conditions Surveys

Q2.2 In an AVERAGE WEEK, how much time do you devote to the following activities during the school day (i.e., time for which you are under contract to be at the school)?

h. Professional (development)[Professional development includes all opportunities, formal and informal, where adults learn from one another including graduate courses, in service, workshops, conferences, professional learning communities and other meetings focuses on improving teaching and learning.]

	2018	2020	2022
None	0.00	10.53	3.7
Less than or equal to 1 hour	40.74	47.37	44.44
More than 1 hour but less than or equal to 3 hours	40.74	26.32	37.04
More than 3 hours but less than or equal to 5 hours	7.41	15.79	11.11
More than 5 hours but less than or equal to 10 hours	11.11	0.00	3.7
More than 10 hours	0.00	0.00	0.00

Table 12. Appendix A - Table A8

Teacher Working Conditions Surveys

Q6.1 Please rate how strongly you agree or disagree with the following statements about teacher leadership in your school.

a. Teachers are recognized as educational experts.

	2018	**2020**	**2022**
Strongly disagree	3.03	5.26	7.41
Disagree	6.06	21.05	22.22
Agree	69.70	36.84	40.74
Strongly agree	21.21	36.84	25.93
Don’t know	0.00	0.00	3.7

Table 13. Appendix A - Table A9

Teacher Working Conditions Surveys

Q6.1 Please rate how strongly you agree or disagree with the following statements about teacher leadership in your school.

b. Teachers are trusted to make sound professional decisions about instruction.

	2018	2020	2022
Strongly disagree	0.00	0.00	7.41
Disagree	9.09	15.79	25.93
Agree	60.61	42.11	37.04
Strongly agree	27.27	42.11	22.22
Don’t know	3.03	0.00	7.41

Table 14. Appendix A - Table A10

Teacher Working Conditions Surveys

Q6.1 Please rate how strongly you agree or disagree with the following statements about teacher leadership in your school.

c. Teachers are relied upon to make decisions about educational issues.

	2018	2020	2022
Strongly disagree	0.00	0.00	7.41
Disagree	3.03	15.79	18.52
Agree	63.64	36.84	48.15
Strongly agree	30.30	47.37	18.52
Don’t know	3.03	0.00	7.41

Table 15. Appendix A - Table A11

Teacher Working Conditions Surveys

Q6.1 Please rate how strongly you agree or disagree with the following statements about teacher leadership in your school.

e. The faculty has an effective process for making group decisions to solve problems..

	2018	**2020**	**2022**
Strongly disagree	3.03	15.79	14.81
Disagree	6.06	10.53	22.22
Agree	63.64	47.37	51.85
Strongly agree	21.21	15.79	3.70
Don’t know	6.06	10.53	7.41

Table 16. Appendix A - Table A12

Teacher Working Conditions Surveys

Q9.1 Please rate how strongly you agree or disagree with the following statements about instructional practices and support in your school.

c. Teachers work in professional learning (communities)[Professional learning communities include formalized groupings of teachers within or across grade and subject areas that meet regularly to plan and assess instructional strategies for student success.] to develop and align instructional practices.

	2018	2020	2022
Strongly disagree	0.00	0.00	0.00
Disagree	0.00	0.00	3.7
Agree	57.58	89.47	66.67
Strongly agree	39.39	10.53	11.11
Don’t know	3.03	0.00	18.52

Table 17. Appendix A - Table A13

Teacher Working Conditions Surveys

Q6.1 Please rate how strongly you agree or disagree with the following statements about teacher leadership in your school.
f. In this school we take steps to solve problems.

	2018	2020	2022
Strongly disagree	0.00	10.53	7.41
Disagree	18.18	31.58	18.52
Agree	60.61	42.11	59.26
Strongly agree	21.21	10.53	11.11
Don’t know	0.00	5.26	3.70

APPENDIX B: COLAB MEETING DESIGN

Table 18. Appendix B - Table of CoLab Meeting Design

	Meeting focus	Launching activity	Experience	Reflection	Sense-making	Application
CoLab One	Identifying norms and identity work	Creating Norms - Brene Brown	Identity work - mapping our learning journey	Sharing our maps	What does community building look like in your classroom so far this year?	Journal prompt: How is the launch of your school year and building a learning community going so far?
CoLab Two	Shared vision	Notice/Wonder-Daffodil bulbs	Sharing data and definitions	How is the work we do like naturalizing ?	What is our vision for the CoLab?	Journal prompt: How is the launch of your school year and building a learning community going so far?
CoLab Three	Rethinking our shared vision	Constellations	How does your constellation impact your science teaching?	How is our shared vision shaped by our constellations?	Has our vision changed? How do we want to proceed?	Journal prompt: What are my strengths as a science teacher? What can I polish?

						How will I do that? My goal between now and the next meeting is…
CoLab Four	Taking a breath	An exercise in balance	Storylines	Vexation venture		What do I carry with me that is an asset to my colleagues in this and the next setting? (The gifts that I share)
CoLab Five	Recalibrating	Write about a moment that made you smile today. Write about a moment you noticed that made one of your students smile today.	Make a map of your students' STEM learning this school year. What do you think their experience has been?	Where do you feel successful as a STEM educator? Where do you feel frustrated by constraints in STEM teaching? Where do you feel you can improve your STEM practice? In what ways do you feel your STEM instruction	How can the CoLab support you this spring?	

				meets the needs of all your students? How do you build a "we" culture in your STEM lessons?		

APPENDIX C: RECRUITMENT MATERIALS

Participating teachers' recruitment script

Dr. Jenkins and I are interested in understanding more about how restorative practices can be used in our school. We are looking for a (K-2, 3-5) teacher to collaborate with us. We are asking you to participate in this research study as part of existing embedded professional learning building on and developing our restorative practices as a community. We already engage in restorative practices and circles during faculty meetings and collaborative conversations. The the purpose of this study is to engage as a community of practice in intentional restorative work. Being intentional about how we meet and the topics we discuss will provide us with the opportunity to be responsive to your individual interests and needs around restorative practices as we plan future professional learning. This study is an invitation to inform and shape how we as staff at Moss Street engage with restorative practices as a community and in our classrooms. I would like to work on integrated science/literacy lessons with you using a restorative and innovative approach. This would include using experiential science lessons and Socratic circles to engage in science that we would plan and co-teach together. We will share student work, our experiences and observations with your grade level team during collaborative conversations once a month and with the full faculty during the monthly meeting. When we present our student artifacts we will use restorative practices to guide the discussion. Dr. Jenkins will work with us on facilitation of the discussions. The goal is to model how restorative practices can be used in a proactive way with students and with each other as a community of practice. Your time commitment will not fall outside of your existing planning and faculty meeting times, except possibly scheduled meetings for interviews that will last no more than 45 minutes. We will plan only during your designated planning time, so we don't intrude on your schedule. I ask that in addition to planning and teaching with me you agree to sit for an interview with me in March and May this school year, and September and March next school year. The interviews are designed to see what perspectives, if any, on restorative practices and teaching have changed over the course of engaging in this experience. Thank you for considering participating in this study.

Survey recruitment email

Hi all,

Please add your voice to our BWES restorative practices instructional strategies by taking five to ten minutes to fill out this survey. I am asking you to participate in this research study as part of existing embedded professional learning, building on and developing our restorative practices as a community. We already engage in restorative practices and circles during faculty meetings and collaborative conversations. The purpose of this study is to engage as a community of practice in intentional restorative work. Being intentional about how we meet and the topics we discuss will provide us with the opportunity to be responsive to your individual interests and needs around restorative practices as we plan future professional learning.

This study is an invitation to inform and shape how we engage with restorative practices as a community and in our classrooms at Beechwood. An information sheet about the study and IRB information is in your mailbox. Your input is anonymous.

Thank you for your time and expertise. Your insights are valuable.
Happy day.

APPENDIX D: CONSENT FORMS

CONSENT TO ACT AS A HUMAN PARTICIPANT

Project Title: Science and Literacy Integration as a Locus for Restorative Practices Professional Learning: A Mixed Methods Study
Principal Investigator and Faculty Advisor:
PI: Dearing Blankmann
Faculty Advisor: Dr. Melody Zoch
Participant's Name:

What are some general things you should know about research studies?
You are being asked to take part in a research study. Your participation in the study is voluntary. You may choose not to join, or you may withdraw your consent to be in the study, for any reason, without penalty. Research studies are designed to obtain new knowledge. This new information may help people in the future. There may not be any direct benefit to you for being in the research study. There also may be risks to being in research studies. Details about this study are discussed in this consent form. It is important that you understand this information so that you can make an informed choice about being in this research study. You will be given a copy of this consent form. If you have any questions about this study at any time, you should ask the researchers named in this consent form. Their contact information is below.

What is the study about?
This is a research project. Your participation is voluntary. I am asking you to participate in this research study as part of existing embedded professional learning building on and developing our restorative practices as a community. We already engage in restorative practices and circles during faculty meetings and collaborative conversations. The purpose of this study is to engage as a community of practice in intentional restorative work. Being intentional about how we meet and the topics we discuss will provide us with the opportunity to be responsive to your individual interests and needs around restorative practices as we plan future professional learning. This study is an invitation to inform and shape how we as staff at Beechwood use restorative practices as a community and in our classrooms.

Why are you asking me?
You are being asked to participate in this study because of your membership in the Beechwood Elementary School staff.

What will you ask me to do if I agree to be in the study?
You will be asked to respond to a short anonymous google form survey on four occasions. between April 2022 and May 2023. This survey seeks insight into instructional strategies and use of restorative practices. It will take about ten minutes. You will be asked for your feedback about faculty circles to improve how circles are facilitated and to tailor your personal interests to the topic addressed in following circles. This should take no more than five minutes. You will be

invited to volunteer to participate in focus groups and/or interviews that will be no more than an hour during the same time frame.

What if I do not want to be in this research study?

The restorative practice activities conducted in the proposed research fall within the boundaries of our staff's normal work activities of teaching and learning at Beechwood Elementary School. Your participation in staff circles and collaborative conversations is expected but your participation will not be used as data for this research project without your permission. Participation in surveys, feedback, interviews and focus groups are voluntary and you are invited to participate as much or as little as you want.

Is there any audio/video recording?

Yes, there will be audio/video recording of lesson planning, science lessons, circles, focus. groups and interviews. The focus groups will be conducted by Dearing Blankmann. However, because your voice will be potentially identifiable by anyone who hears the recording, your confidentiality for things you say on the recording cannot be guaranteed although the researcher will try to limit access to the recording as described below. Your image may be identifiable on video. Ms. Blankmann alone will conduct the interviews and focus groups. She will be the only person to listen to and see the audio/video. The audio and video will be stored securely on BOX and accessible only to Ms. Blankmann.

What are the risks to me?

The Institutional Review Board at the University of North Carolina at Greensboro has determined that participation in this study poses minimal risk to participants.

If you have questions, want more information or have suggestions, please contact Dearing Blankmann at (610) 844 7951 or email be at d_blankm@uncg.edu. The faculty advisor for this project is Dr. Melody Zoch. If you have any concerns about your rights, how you are being treated, concerns or complaints about this project or benefits or risks associated with being in this study please contact the Office of Research Integrity.

Are there any benefits to society as a result of me taking part in this research?

This study is designed as a means of building a community of practice with educators at an BWES. Leveraging Restorative and circles as inherently discursive spaces, this research may serve as a model for future studies to begin to intentionally (re)shape educational settings by providing educators time/space to do the personal/professional work necessary to bring about social change. Transformative pedagogy requires creating a space that feels safe, fostering in each member a sense of responsibility to participate. Circles are loci for equitable and productive discourse because they inspire a sense of safety, trust, encourage inclusivity, collectivity, responsibility and connection. This study may contribute to pathways towards relationship building across all members of a school community through collaborative and discursive practices that restorative. Further, this study may add to the growing body of literature that reflect innovative educational practices such as integrated curriculum, place-based learning, project-based learning, inquiry, family involvement and core STEM practices enhance student

learning to address deeply ingrained inequities in the educational system by designing curricula for socio-spatial learning and rightful presence.

Are there any benefits to me for taking part in this research study?

Benefits to you may include a deeper sense of belonging to our community of practice as educators here at Beechwood Benefits may also include amplification of your voice on matters of curriculum development, classroom community and school culture. Such benefits may also result in an increase of students' sense of belonging to a community of learners.

Will I get paid for being in the study? Will it cost me anything?

There are no costs to you or payments made for participating in this study.

How will you keep my information confidential?

Dearing Blankmann will conduct all focus groups and interviews. Information from the focus groups and interviews will be kept on BOX and only Ms. Blankmann will have access. If information you have related is disseminated your identity will be protected using pseudonyms. Additionally, all surveys and feedback forms are anonymous. Ms. Blankmann will review first. If there appears to be any identifying information Ms. Blankmann will not disseminate. All information obtained in this study is strictly confidential unless disclosure is required by law. For Internet Research, include this wording: We will be using Google Forms. Absolute confidentiality of data provided through the Internet cannot be guaranteed due to the limited protections of Internet access. Please be sure to close your browser when finished so no one will be able to see what you have been doing.

Will my de-identified data be used in future studies?

Your data will be destroyed in 5 years, May 2027. The five-year point will begin at the close of this study, May 2023. De-identified data will not be stored and will not be used in future research.

What if I want to leave the study?

You have the right to refuse to participate or to withdraw at any time, without penalty. If you do withdraw, it will not affect you in any way. If you choose to withdraw, you may request that any of your data which has been collected be destroyed unless it is in a de-identifiable state. The investigators also have the right to stop your participation at any time. This could be because you have had an unexpected reaction, or have failed to follow instructions, or because the entire study has been stopped.

What about new information/changes in the study?

If significant new information relating to the study becomes available which may relate to your willingness to continue to participate, this information will be provided to you.

Voluntary Consent by Participant:

By signing this consent form you are agreeing that you read, or it has been read to you, and you fully understand the contents of this document and are openly willing consent to take part in this study. All of your questions concerning this study have been answered. By signing this form, you are agreeing that you are 18 years of age or older and are agreeing to participate, in this study described to you by .

CONSENT TO ALLOW VIDEO RECORDING OF A MINOR

Project Title: Science and Literacy Integration as a Locus for Restorative Practices Professional Learning: a Mixed Methods Study

Principal Investigator and Faculty Advisor (if applicable): Researcher: Dearing Blankmann

Faculty Advisor: Dr. Melody Zoch

What is the study about?

The purpose of this research study is to examine how Restorative practices and Socratic circles can be used in the context of embedded professional learning for staff to promote utilization of these practices as tools for orchestrating and nurturing strong and equitable learning communities within their classrooms. The aim of this pilot study is to begin to examine how Restorative practices and Socratic circles can be used in the context of embedded professional learning for staff to promote utilization of these practices as tools for orchestrating and nurturing strong and equitable learning communities within their classroom. To understand this better, we plan to observe _____ (Teacher's name) to give us insight into instructional strategies that support restorative practices. Teacher may be engaged in facilitation of whole or small group discussions, demonstrating an idea or creating a chart with the entire class or small group, or other instructional practices that directly engage students.

What are you asking me to do?

Although your child is not a participant in our study, we will be videotaping your child's teacher in the classroom while they are being taught using restorative practices such as integrated science and literacy. Since your child is in a class in which we are conducting our study, it is possible that your child's image/voice could be included in the video recording. The focus of our video recording will be on your child's teacher. While your child may be included in the videos, we will not be observing his/her behavior or using any of their recorded behaviors or information about them as data in our study.

Are there any risks to my child?

The Institutional Review Board has determined that participation in this study poses minimal risks. Video will be securely stored on BOX. If you have any concerns about your child's rights, how they are being treated or if you have questions, want more information or have suggestions, please contact the Office of Research Integrity.

Questions about this project or benefits or risks associated with being in this study can be answered by Dearing Blankmann.

What if I don't want you to video record my child?

If you do not want your child to be video recorded, please contact Dearing Blankmann If you do so, we will make sure that we do not record your child while observing your child's teacher in our study. If, however, you are okay with your child being video recorded, you there is no action needed on your part.

CONSENT FOR A MINOR TO ACT AS A HUMAN PARTICIPANT: LONG FORM

Project Title: Science and Literacy Integration as a Locus for Restorative Practices Professional Learning: A Mixed Methods Study

Principal Investigator and Faculty Advisor:

PI: Dearing Blankmann

Faculty Advisor: Dr. Melody Zoch

Participant's Name:

What are some general things you should know about research studies?

Your child is being asked to take part in a research study. Your child's participation in the study is voluntary. You may choose for your child not to join, or you may withdraw your consent for him/her to be in the study, for any reason, without penalty.

Research studies are designed to obtain new knowledge. This new information may help people in the future. There may not be any direct benefit to your child for being in the research study. There also may be risks to being in research studies. Details about this study are discussed in this consent form. It is important that you understand this information so that you can make an informed choice about your child being in this research study. You will be given a copy of this consent form. If you have any questions about this study at any time, you should ask the researchers named in this consent form. Their contact information is below.

What is the study about?

This is a research project. Your child's participation in this project is voluntary. This study is exploring the restorative practice of building a community of learners through the integration of science and literacy. Your child's teacher is participating in the project designing science units that build students' reading and writing skills through collaborative science exploration. We may record the lessons by audio/video as a reflection tool. We may select your child's work to share with colleagues at here at Beechwood, at conferences or in professional journals. This study is exploring teacher learning and facilitation of science/literacy integration as a restorative practice.

Why are you asking my child?

Your child is being asked to participate as a member of Ms. Johnson's class.

What will you ask my child to do if I agree to let him or her be in the study?

Your child will not be asked to do anything outside of existing schoolwork. For the purposes of this study, we (the researchers) are asking your permission to include your child's science and literacy work, including DIBELS data and spelling inventory data, pre/post science score, science journal entries and other written work as data for our study. The inclusion of your student's work is to document positive student outcome.

Is there any audio/video recording of my child?

Yes. There may be audio/video recording in which your child appears. The purpose of the recordings will be for teacher professional development. The audio and video may record teacher's whole or small group instruction of integrated science/literacy lessons, group

discussions, or facilitation of science or engineering explorations. Because your child's voice and image will be potentially identifiable by anyone who hears or views the recording, confidentiality for things said on the recording cannot be guaranteed although the researcher will try to limit access to the tape as described below.

What are the dangers to my child?

The Institutional Review Board has determined that participation in this study poses minimal risk to participants. If you have questions, want more information or have suggestions, please contact Dearing Blankmann

If you have any concerns about your rights, how you are being treated, concerns or complaints about this project or benefits or risks associated with being in this study please contact the Office of Research Integrity.

Are there any benefits to society because of my child taking part in this research?

This study is designed as a means of building a community of practice with educators at an BWES. Leveraging class discussions and integrated science and literacy lessons, this research may serve as a model for future studies to begin to intentionally (re)shape educational settings by embedding time/space for educators to do the personal/professional work necessary to bring about social change. This study may contribute to pathways towards relationship building across all members of a school community through collaborative and discussion-based practices. Further, this study may add to the growing body of literature that reflect innovative educational practices such as integrated curriculum, place-based learning, project-based learning, inquiry, family involvement and core STEM practices which enhance student learning and work to address deeply ingrained inequities in the educational system by designing curricula for socio-emotional learning.

Are there any benefits to my child as a result of participation in this research study?

Benefits to your child may include a deeper sense of belonging to the class community of learners. Benefits may also include increased motivation to go to school and participate in class activities and improvements in literacy skills.

Will my child get paid for being in the study? Will it cost me anything for my kid to be in this study?

There are no costs to you or payments to you or your child as a result of participation in this study.

How will my child's information be kept confidential?

Information from this study will be kept on BOX and only Ms. Blankmann will have access. If information from your child is disseminated your identity will be protected by ensuring their name is not on any work, their name is not associated with any test data, and by using pseudonyms when your child is referenced. All information obtained in this study is strictly confidential unless disclosure is required by law.

Will my child's de-identified data be used in future studies?

The data will be kept for five years following the closure of the study. De-identified data will not be stored and will not be used in future research projects.

What if my child wants to leave the study or I want him/her to leave the study?

Choosing not to allow your child to participate or withdrawing your child from the study will not affect your child's grades or their status at school. You have the right to refuse to allow your child to participate or to withdraw him or her at any time, without penalty. If your child does withdraw, it will not affect you or your child in any way. If you or your child chooses to withdraw, you may request that any data which has been collected be destroyed unless it is in a de-identifiable state. The investigators also have the right to stop your child's participation at any time. This could be because your child has had an unexpected reaction, has failed to follow instructions, or because the entire study has been stopped.

What about new information/changes in the study?

If significant new information relating to the study becomes available which may relate to your willingness allow your child to continue to participate, this information will be provided to you.

Voluntary Consent by Participant:

By signing this consent form, you are agreeing that you have read it, or it has been read to you, you fully understand the contents of this document and consent to your child taking part in this study. All of your questions concerning this study have been answered. By signing this form, you are agreeing that you are the legal parent or guardian of the child who wishes to participate in this study described to you by .

IRB Information Sheet

Project Title: Science and Literacy Integration as a Locus for Restorative Practices Professional Learning: a Mixed Methods Study
Principal Investigator: Dearing Blankmann
Faculty Advisor: Dr. Melody Zoch

What is this all about?

I am asking you to participate in this research study as part of existing embedded professional learning building on and developing our restorative practices as a community at BWES. In addition to the time you already spend in collaborative conversations and faculty meetings, this project will only take 5 to 10 minutes when filling out surveys and feedback forms about restorative practices at BWES. You will be invited to participate in interview and/or focus groups which will be no more than an hour on four occasions between now and May 2023. Your participation in staff circles and collaborative conversations is expected but your participation will not be used as data for this research project without your permission. Participation in surveys, feedback, interviews and focus groups are voluntary and you are invited to participate as much or as little as you want. This study is an invitation to inform and shape how we as staff at BWES engage with restorative practices as a community and in our classrooms.

How will this negatively affect me?

No, other than the time you spend on this project there are no know or foreseeable risks involved with this study.

What do I get out of this research project?

Benefits to you may include a deeper sense of belonging to our community of practice as educators here at Beechwood Benefits may also include amplification of your voice on matters of curriculum development, classroom community and school culture. Such benefits may also result in an increase of students' sense of belonging to a community of learners.

Will I get paid for participating?

There are no costs to you and there will be no payments made for participating in this study.

What about my confidentiality?

We will do everything possible to make sure that your information is kept confidential. All information obtained in this study is strictly confidential unless disclosure is required by law. Dearing Blankmann will conduct all focus groups and interviews. Information from the focus groups and interviews will be kept on BOX and only Ms. Blankmann will have access. If information you have related is disseminated your identity will be protected using pseudonyms. Additionally, all surveys and feedback forms are anonymous. Ms. Blankmann will review first. If there appears to be any identifying information Ms. Blankmann will not disseminate. All information obtained in this study is strictly confidential unless disclosure is required by law. We will be using Google Forms. Absolute confidentiality of data provided through the Internet cannot be guaranteed due to the limited protections of Internet access. Please be sure to close

your browser when finished so no one will be able to see what you have been doing. Because your voice will be potentially identifiable by anyone who hears the recording, your confidentiality for things you say on the recording cannot be guaranteed although the researcher will try to limit access to the recording as described in this section.

What if I do not want to be in this research study?

You do not have to be part of this project. This project is voluntary, and it is up to you to decide to participate in this research project. If you agree to participate at any time in this project, you may stop participating without penalty.

What if I have questions?

If you have questions, want more information, or have suggestions, please contact Dearing Blankmann If you have any concerns about your rights, how you are being treated, concerns or complaints about this project or benefits or risks associated with being in this study please contact the Office of Research Integrity.

APPENDIX E: INSTRUMENTS

Teacher Survey

1) How many years of experience in education do you have?

- pre-service
- Beginning teacher
- 4-10 years
- 11-20 years
- 21 years or more

2) What is your highest completed level of education? ***(optional)***

- *High school*
- *B.A.*
- *Master's degree*
- *PhD*

3) How do you identify? ***(short answer, optional)***

4) How would you describe Social Justice in Education? What does it look like to you? What does it sound like to you?

5) How would you describe your views about teaching practices? ***(self-identity)***
Select all that apply to you.
Traditional
Social justice oriented
Collaborative
Content oriented
Other _____describe

6) Which teaching practices do you believe are most important for student learning?
(Rank: 1 - least important to 7 - most important)
(Pedagogical beliefs and instructional practices, ref. Coaching for Equity)
(markers of self-determination: autonomy, competence, relatedness)

- Designing curriculum for student agency and autonomy ***(Emotional intelligence and Cultural Competence)***

- Building strong relationships with students ***(Emotional intelligence and Cultural Competence)***
- Building strong relationships with students ***(Emotional intelligence and Cultural Competence)***
- Integrated curriculum ***(skill, knowledge, emotional intelligence and cultural competence))***
- Clear routines and procedures ***(Skill and knowledge)***
- Rigor and relevance of lessons ***(Skill and knowledge)***
- Assessment ***(Skill and knowledge)***

7) What are the greatest influences on your current views of teaching practices? (rank: 1 - least relevant to 6 - most relevant) ***(epistemology)***

- My experience as a student (K-higher learning).
- My pre-service experience.
- Professional learning I seek outside of Beechwood
- Professional learning I engage in through Beechwood
- Personal reading and research.
- Collaborative discussions with colleagues.

Select the choice that best answers the following questions.
(1- very uncomfortable, 2- uncomfortable, 3 - comfortable, 4- very comfortable)
(Pedagogical stances and instructional practices)

8) How comfortable are you using restorative circles and practices as a tool for conflict resolution?

9) How comfortable are you using restorative circles and practices as a tool for discipline?

10) How comfortable are you using restorative circles and practices as a tool to build collaborative learning communities?

11) How comfortable are you using restorative circles and practices as a tool for content learning?

12) What are your views on restorative circles and practices and how we are implementing them here at Beechwood Elementary School? ***(Long answer question)***

APPENDIX F: PROTOCOLS

Updated Interview Protocol 8_2022

1) Tell me a little about your teaching background.

2) Reflecting on your journey as a teacher, your educational experience, professional development, personal expiration, ect., what are the greatest *influences* on your current views of teaching practices? (epistemology)

Exploring questions:
Is there an example of an experience that was pivotal to your development as an educator?

3) How would you describe a traditional instructional style? (self-identity)
How would you describe a social-justice oriented instructional style?
How would you describe a collaborative instructional style?
How would you describe a content-oriented instructional style?
How would you describe an experiential learning instructional style?

4) Are there other teaching styles you would add?
Can you say more about that?
Explain what you mean?

5) Of these, which do you think is most like you? Why do you think that?
Which one is least like you? Why do you think that?
Can you say more about that?
Explain what you mean?

6) Which teaching practices do you believe are most important for student learning? Prioritize the cards from least important to most important. (Pedagogical beliefs and instructional practices, ref. *Coaching for Equity Chapter 5*) (markers of self-determination: autonomy, competence, relatedness) **(card sort)**

- Designing curriculum for student agency and autonomy (Emotional intelligence and Cultural Competence)
- Building strong relationships *with* students (Emotional intelligence and Cultural Competence)
- Building strong relationships *between* students (Emotional intelligence and Cultural Competence)
- Integrated curriculum (Emotional intelligence, cultural competence, skill and knowledge)

- Clear routines and procedures (Skill and knowledge)
- Rigor and relevance of lessons (Skill and knowledge)
- Assessment (Skill and knowledge)

Exploring questions:
Tell me about your sort. Why did you order them this way?
What does *XXX* look like in your classroom?
Can you give me an example of XXX from your experience?

7) What does Social Justice in Education look like in action to you?
8) How do you define restorative practices?

On these cards are ways in which restorative practices are used in education. Are there any I left out?
Please organize them to reflect how you use restorative practices in your classroom?

- as a mechanism for conflict resolution
- as a mechanism for classroom management
- as a mechanism for discipline?
- as a mechanism to build collaborative learning communities?
- as a mechanism for content learning?

9) What are your views on the role of restorative practices *here at Beechwood Elementary School*, not just with the children but faculty as well? Over time?

Exploring questions:
Can you say more about that?
What do you mean by XXX?
Can you give me an example of XXX from your experience?

Focus Group Protocol

Materials needed:
Snacks
Chart paper and markers or smart board
Cards for sorts
Index cards
Pens

Before we begin:

- Assurance of confidentiality. Remind them that pseudonyms will be used when I talk or write about our conversation.
- Ice Breaker - Clymer Cards spread in the center of the table. Select a card that best represents where you are situated on the courageous conversations compass at this moment.

Norms: set by group (If the same group returns for each focus group norms will not necessarily have to be reconceived just reminded- Use Brené Brown's list of values.
Circle three and write them on sticky notes.
Categorize sticky notes. Narrow list of common values and translate into group norms.

1) How many years of experience in education do you have? (each participant)

Capture on chart paper or smart board our definitions (Be sure to photograph)
2) How would you describe a traditional instructional style? (self-identity)
How would you describe a social-justice oriented instructional style?
How would you describe a collaborative instructional style?
How would you describe a content-oriented instructional style?
3) Are there other teaching styles you would add?

4) Which of these teaching practices do you believe are most important for student learning? (pedagogical beliefs and instructional practices, ref. *Coaching for Equity Chapter 5*) (markers of self-determination: autonomy, competence, relatedness) (card sort as a group)
Take a look at the cards. Organize the cards from least important to most important. If there are any teaching practices you would include, feel free to write it on an index card and add it in.

- Designing curriculum for student agency and autonomy (Emotional intelligence and Cultural Competence)
- Building strong relationships *with* students (Emotional intelligence and Cultural Competence)
- Building strong relationships *between* students (Emotional intelligence and Cultural Competence)
- Clear routines and procedures (Skill and knowledge)

- Rigor and relevance of lessons (Skill and knowledge)
- Assessment (Skill and knowledge)
- Experiential learning

Exploring questions:
Tell me about how you organized the cards.
What does *XXX* look like in your classroom?
Can you give me an example of XXX from your experience?

5) Write on your sticky note(s) the educational experiences that most influence your current views of teaching practices?
(epistemology)
(Sticky note will be added to chart.)

Exploring questions:
Is there an example of an experience that was pivotal to your development as an educator?

7) What does Social Justice in Education look like in action to you?

8) How do you define restorative practices?

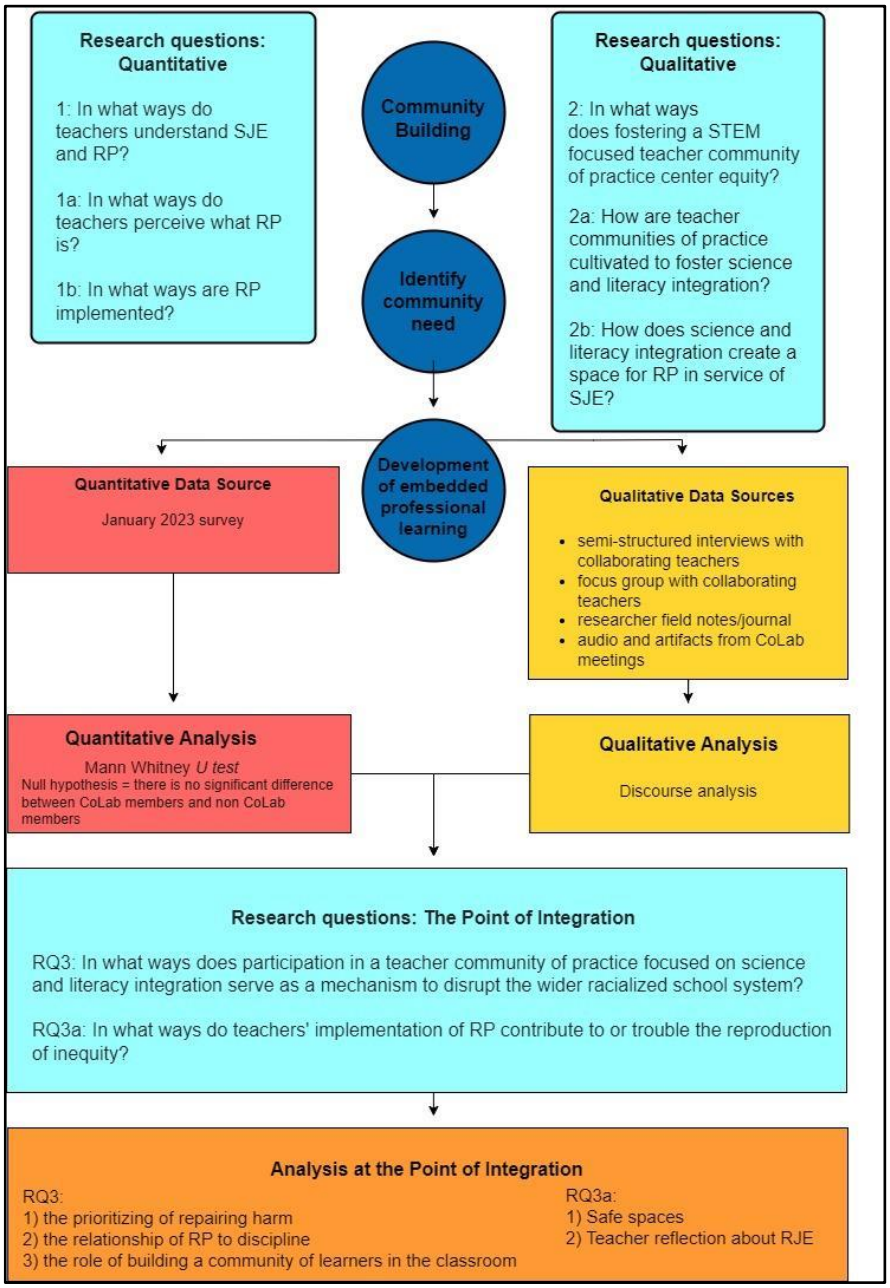
On these cards are ways in which restorative practices are used in education. Are there any I left out? If so, fill in the blank cards.
Please organize them to reflect how you use restorative practices in your classroom? (for admin: What are your views on how restorative practices are best implemented in the classroom)

- as a mechanism for conflict resolution
- as a mechanism for classroom management
- as a mechanism for discipline?
- as a mechanism to build collaborative learning communities?
- as a mechanism for content learning?

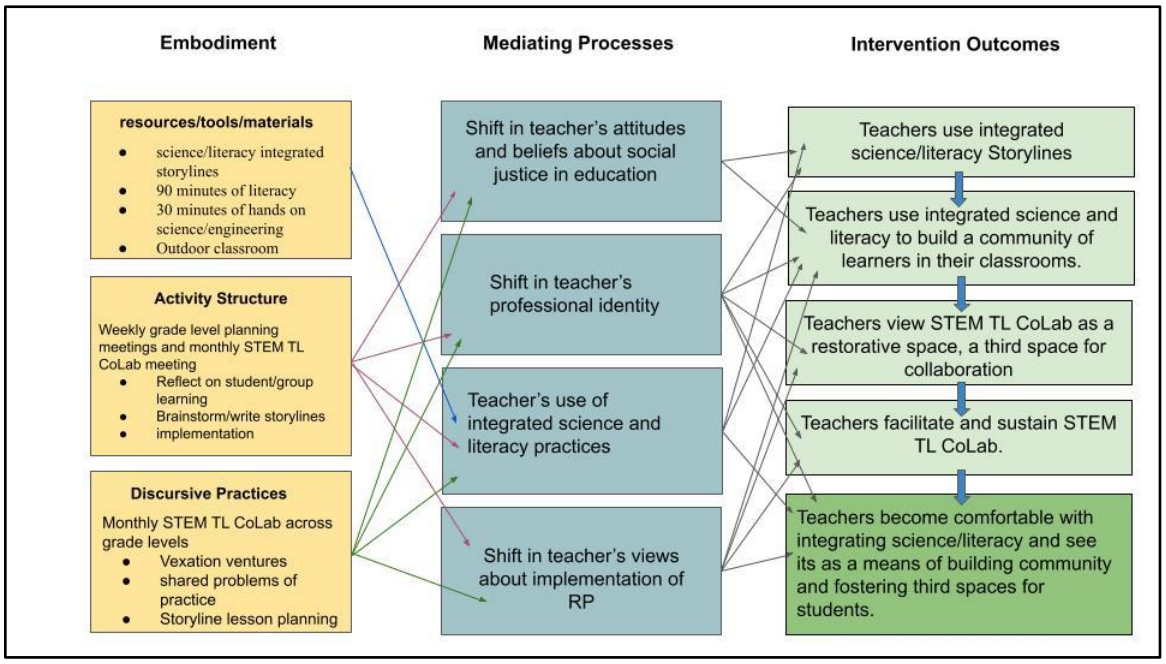
11) What are your views on the role of restorative practices *here at Beechwood Elementary School*, not just with the children but faculty as well? Over time?

To end:
Again, I want to reiterate that our discussion today will remain between us.
Thank you for coming today. Does anyone have further thoughts or something to share before we go our separate ways?
If you have follow up questions or thoughts I am happy to meet with you or you can email me.
I appreciate you all. Thank you again.

APPENDIX G : MIXED METHODS DESIGN



APPENDIX H : CONJECTURE MAP



APPENDIX I: QUALITY CRITERION

Table 19. Appendix I - Table of Research Design Quality Criterion

Study phase	Criterion
Planning	A rationale is provided for using a mixed methods design to address the research problem and questions
	The philosophical assumptions of the researcher are made clear
	The study purpose and research questions are clearly stated
	A literature review and/or conceptual framework is provided that situates
	the study and informs the research questions and methods
	Key literature on mixed methods is reviewed in support of the mixed methods approach chosen by the authors
Undertaking	Key literature on mixed methods is reviewed in support of the mixed methods approach chosen by the authors
	Quantitative and qualitative components are well implemented and adhere to the quality criteria of each tradition
	Quantitative and qualitative components of the study are effectively integrated
	The mixed methods design is clearly described in terms of purpose, phasing, priority, and process of integration of the quantitative and qualitative components

	The mixed methods design is clearly described in terms of purpose, phasing, priority, and process of integration of the quantitative and qualitative components
	Sampling, data collection and data analysis procedures referring to both quantitative and qualitative components are linked to the study aims and research questions
	Sampling, data collection and data analysis procedures referring to both quantitative and qualitative components are described in sufficient detail
	The mixed methods design is linked to the study aims and research questions

	The mixed methods design matches the rationale given for combining quantitative and qualitative components
Interpreting	Inferences are consistent with the study findings
	Inconsistencies between findings/ inferences emerging from quantitative and qualitative components are stated
	Inferences are consistent with the study aims and research questions
	Inferences derived from the quantitative and qualitative findings are adequately incorporated in the meta inferences regarding the entire study
Disseminating/ applying findings	The research process is reported transparently
	The unique insights and added value gained from using a mixed methods design are described

	The value and implications of study findings for policy and practice are explained

(Fàbregues, & Molina-Azorín, 2017).