

June 2021

Making Meaning of Equity in a Computer Science for All Research Practitioner Partnership

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**MAKING MEANING OF EQUITY IN A COMPUTER SCIENCE FOR ALL
RESEARCH PRACTITIONER PARTNERSHIP**

A Dissertation Presented

by

ITZA DEIANIRA MARTÍNEZ

Submitted to the Graduate School of the
University of Massachusetts Amherst in partial fulfillment
of the requirements for the degree of

DOCTOR OF PHILOSOPHY

May 2021

College of Education
Educational Leadership and Policy Concentration

**Making Meaning of Equity in a Computer Science for All Research
Practitioner Partnership**

A Dissertation Presented

By

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DEDICATION

To my beloved sister, my best friend. Thank you for being a true example of what it means to live life with love, integrity, faith, hope, and dedication.

ACKNOWLEDGMENTS

Alone a youth runs fast, with an elder slow, but together they go far. — Luo proverb

First and foremost, I thank God for all I have, and importantly all I do not have. So many people have been essential in helping me achieve my dream of getting to my doctorate. I would first like to thank my committee members. I recall my first interaction with Dr. Rebecca H. Woodland. She was a part of my phone interview for the program. I heard her bright energy as I nervously paced my art classroom. When I met her for class later on, I quickly admired not only her many abilities, in particular, but her ability also to help explain things that were at “30,000 feet” so to speak and connect them down to “3 feet” on the ground. I continue to admire the work she has done and will always be grateful for the (and impromptu Zumba dance parties) that brought my work to a higher level. Dr. Kathryn McDermott gave me the spark for my first framework for my comprehensive examination. She has always been a thoughtful, calm presence and always seems to know which questions to ask that will push my thinking forward. Thank you also for holding a virtual space this past academic year. I would not have been able to finish without the writing group. My knowledge and awareness in the realm of social justice would have remained naïve had it not been for the many discussions, debates, and most importantly, dialogues with Dr. Ximena U. Zúniga; thank you for your time, care, and persistence in helping me move forward.

My network is graced with many family members. First, I want to thank my parents, José and Esther, for always offering a loving word of advice, encouragement, and imbuing in me the will to achieve my dreams. My sister and her family, for sheltering me from the storm of self-doubt and many family living room parties, laughter, good

food, and even better company. My brothers and their families, thank you, though we have been far apart, you have always been there rooting for my success and hearing me out. My Durán family, you have been a rousing burst of love and enthusiasm in the final stretch, thank you. To my Pettengill family, I thank you for being an unwavering well of support and joy throughout our many years of friendship. I also want to say thank you to my cats, Tesla and Tyson, for being wonderful support and loving companions. And finally, thank you to my ancestors from many lands for making my existence possible.

In order to get work done, you have to have accountability, friends, and critical friends to nudge you along and commiserate in the process, special thanks to Becky, Annie, and Mike for meetings and navigation support! While life may have been heavily focused on school, I have many thanks to give to my friends for providing a wonderful life beyond UMass. In particular, I am grateful for many café working hours, dancing, and adventuring to the Latinos @ Happy Valley (Carlos, Diego, Mario, Matias, Camilo). Thank you for moments of heart, check-ins, philosophical conversations, and pomodoro sessions, Marjorie, Dayana, Denny, Ruth, Jamaal, and Javier. Thank you also to Erin and Carmen, for helping me remember other aspects of myself beyond graduate school, too.

Lastly, to my partner, David, for always loving me, supporting me, and laughing with me, even amid the chaos, thank you. I am so excited to build our next adventure together.

ABSTRACT

MAKING MEANING OF EQUITY IN A COMPUTER SCIENCE FOR ALL RESEARCH PRACTITIONER PARTNERSHIPS

MAY 2021

ITZA DEIANIRA MARTÍNEZ, B.F.A., MANHATTANVILLE COLLEGE

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Directed by: Professor Rebecca H. Woodland

This dissertation explored how a Computer Science for All (CSforALL) Research Practitioner Partnership (RPP) conceived of and addressed equity through their professional learning community (PLC) structure. Through an adapted equity framework, I analyzed qualities of equity literacy, as defined by Gorksi and Pothini (2018), as well as access and participation of three centrally located PLCs. Using qualitative methods, I examined the meeting artifacts, such as agendas, meeting notes, and video recordings, in order to understand how equity literacy developed over time. I also examined if and how established protocols, commonly used to facilitate collaborative work in PLCs, promoted equity literacy. Over time, PLC members were able to engage in dialogues that helped develop their equity literacy, particularly their ability to recognize, redress, and begin to create and sustain an environment that promotes equity. Further protocols were found to support equity awareness and some reflective discussion. Ideas for further research and proposed shifts for protocols to encourage development of equity literacy are also included.

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CHAPTER 1

INTRODUCTION

Imagine a bright third grade elementary school classroom. Students sit squirming at their laminated pine topped semi-circle tables. They try to sit still in their navy-blue chairs with the metal buttons on the back, as their little kid legs swing in anticipation. The teacher has announced that they are all about to continue working on their Scratch projects, a block-based visual programming language and website from Massachusetts Institute of Technology (n.d.). The teacher hands out laptops and graphic organizers the students have previously completed. Children's large handwriting is visible on the pages of the graphic organizers returned to them. They start booting up their computers right away, some even start logging on to the website, enthusiastic to continue telling their stories, animating their avatars, and coding their backgrounds; they have their graphic organizers to remind them where they were in the process. While some of the students are oozing excitement, a few sit sullenly. The teacher knows something is not quite right and makes a mental note of the distant gazes, slouched postures, and expressions of self-doubt, knowing she will visit them first.

In the classroom just described, like many classrooms, are teachers and students working hard on building 21st-century skills. The teacher could be asking themselves questions around *why* the seemingly sullen students are not engaging like their peers. The assumptions the teacher makes about the "why," will impact the students' experience with the Computer Science (CS) activity. Teachers benefit from being able to talk with others around their concerns. Further, being able to communicate more about what might be going on for their students' contexts and the implications of that on the teaching would

also help. When and how that team of colleagues come together will influence whether or not all students will be able to access, participate in, and reap positive outcomes from the curriculum.

The trend to understand and support CS education in our school systems has grown over the years. Code.org founded the Advocacy Coalition in 2013, and since then, “nearly all states have made policy changes to ensure that students have an opportunity to learn computer science” (Code.org, 2020, para. 2). Later, in January 2016, President Barack Obama announced, through the Office of Science and Technology Policy, a call for more support of CS education for all students. On September 25, 2017, President Trump signed a memorandum to support funding for grants to support science, technology, engineering, and mathematics (STEM) education. The memorandum set a goal for the 2018 fiscal year to dedicate \$200 million a year to support STEM, which included CS (The White House, 2017). The National Science Foundation (NSF), the U.S. Department of Education, and other federal and private organizations support presidential calls by encouraging the development of Research Practitioner Partnerships (RPPs) through funding initiatives, such as Early-Concept Grants for Exploratory Research and Computer Science for All (CSforALL). RPPs exist in various academic/community partnership spaces within NSF. The CSforALL RPP is a research program that has been developed to get CS and computational thinking (CT) in preK-12 settings. The overarching focus within the CSforALL RPP initiative is implementation of CS/CT in public schools. A core element of a CSforALL RPP is the “forAll” component. The RPP enables access to increased participation in CS/CT to typically underserved and

underrepresented populations in CS, such as women, people with (dis)abilities¹, and the global majority².

This study takes place in the context of one NSF funded RPP called CSforALL. The RPP in this study was working to explore how to provide high quality CS and CT curricula for *all* students in an urban preK-5 setting. The CS/CT curricula being created are specifically being directed to promote inclusion of underrepresented population's in CS/CT. As noted, the conceptualization of "forAll" implies addressing issues of equity. However, *how* to engage in collaborative problem-solving around issues of equity/inequity remains unclear. The objective of this research is to a) explore how a CSforALL RPP conceives of and addresses equity over time and b) examine if and how established protocols to see how they conceive of and address equity.

Background of the Problem—Student Access and Participation in CS

The CSforALL initiative seeks to provide a high-quality CS/CT curriculum to *all* students. The initial two primary problems of practice are access, that is, the need to create and deliver a CS/CT curriculum, and participation, that is, to provide the CS/CT curriculum to all students. A problem of practice "is something that you care about that would make a difference for student learning if you improved it" (City et al., 2011, p. 102). In the case of CSforALL, the problem of practice is ensuring equity. Not only do the students need access to the curriculum (therefore, the curriculum must be generated) but all students must be able to meaningfully engage with the curriculum. If CS/CT high

¹ I am choosing to use this phraseology "(dis)abilities" and "(dis)ability" to understand broad identity categories, so that my words provide options for understandings of identity; a way not to assume identities or abilities and aim to not use deficit language (Personal communication, H. Montague-Asp, March 26, 2021).

² I am choosing to use the term "global majority" as opposed to "minorities" because people of color are *not* a minority. Using this diminutive term minimizes the sense of the population worldwide.

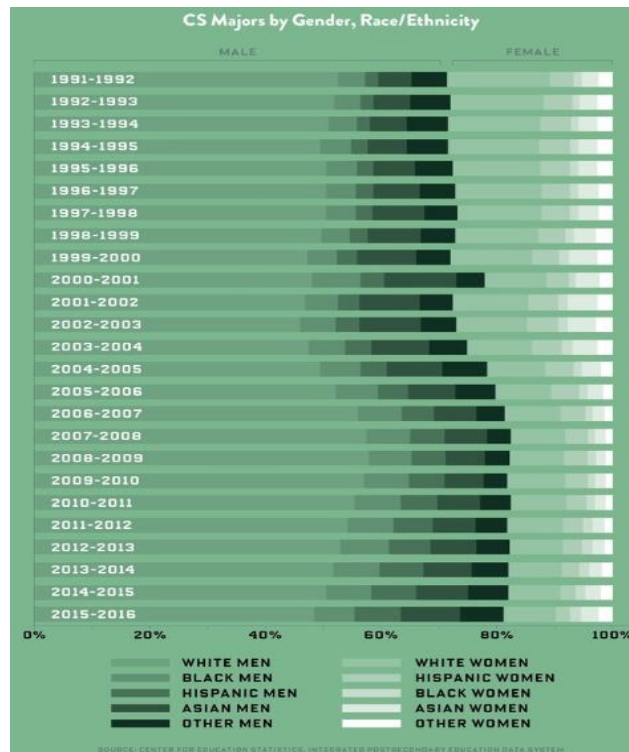
quality curriculum is not created and all students are unable to participate with it, then the students are missing important 21st-century skills that will have long-term impact on their lives.

An indicator that a state has prioritized a field of study is having developed standards for that field. The creation of the field's standards is that experts agreed upon measures of proficiency. Specific to the field of CS/CT, 34 states have created K-12 computer science standards (Code.org, 2017); Massachusetts is one of them.

Figure 1

CS Majors by Gender, Race/Ethnicity (Myers, 2018)

Source: Center for Educational Statistics, Integrated Postsecondary Education Data System



In June 2014, the Department of Elementary and Secondary Education, in collaboration with the Massachusetts Computing Attainment Network, worked to research and develop recommendations for the standards; from November 2014-May 2015, the panel worked to write the standards, and in May 2015-June 2016, the standards were formally adopted (Massachusetts Department of Elementary and Secondary Education, 2018). Although standards do exist and are an important step, they are not enough; not all schools provide high-quality CS/CT curriculum. For instance, in the District under study, there are 60 schools overall: 5 of 11 high schools, 2 of 14 middle schools, and 5 of 35 elementary schools offer CS/CT curriculum (Massachusetts Department of Elementary and Secondary Education, 2018 and P. Foster, personal communication, August 8, 2019). Having statewide CS standards is necessary but not sufficient for educators to require CS/CT in schools. The standards are simply a policy lever that support having CS/CT access available to students. In schools where CS/CT is available, not all students have access to the courses. For example, female-identifying students took 29% of all CS AP exams in 2018, and 24% of all CS AP exams were taken by those of the global majority (Code.org, 2020). The trend of weak academic participation in CS from female and global majority students continues even after high school. Although the “Bureau of Labor Statistics projects [that] computer science research jobs will grow 19% by 2026 ... women only earn 18% of computer science bachelor’s degrees in the United States” (Computer Science.org, 2019, para. 1). It is evident that in colleges and projecting ahead that the field is predominantly comprised of White males. While Figure 1 does not include students with (dis)abilities, it is noted that diversity is lacking in the CS field. Major barriers to CS in preK-12 settings are lack of funding for technologies, lack of

funding for a CS teacher salary, inconsistent policies across states, untrained and lack of teacher confidence in CS/ CT, lack of priority for CS/CT class time, limited access to AP CS/CT courses, perceived lack of support from school board and parents on the part of principals (Google & Gallup, 2017). Another difficulty is that there is a struggle for time to dialogue, process, and infuse any aspect of an innovation in the classroom and classroom management.

CS/CT is important, and there are standards that exist that can support access of CS/CT curriculum in preK-12 schools. However, there is not consistent implementation or CS/CT in schools and participation in CS/CT curriculum. There is a problem of access to quality CS/CT curriculum at the preK-12 level and a disparity with regard to participation of students who engage in CS/CT, especially students of the global majority, women, and students with (dis)abilities. In order to address the two problems of practice, access, and participation, RPP PLC members need to engage in collaborative problem-solving and develop their equity literacy.

Statement of the Problem—Equity Literacy

CS RPPs are predicated on student access and participation in CS/CT curricula. CSforALL has an equity core, that is “for all” that aspires to address issues of systemic access and participation as well as how curriculum is understood by the educators who build and implement it in preK-12 schools. PreK-12 schools are complex systems that bring together students, teachers, staff, and families, that are socially situated in different and intersecting systems of advantage and disadvantage (Adams & Zúñiga, 2016), which impacts the school culture and how teaching and learning occur. Hence, questions related to teacher identity, culture, and biases, and teachers’ understanding of their students’

identities and cultures are essential. Often teachers do not receive training on how to develop awareness of equity issues, such as race, gender, or (dis)abilities, or how to address issues of identity and culture in the context of CS/CT curriculum. Further still, teachers, like many other practitioners, often lack guidance and support to engage and facilitate difficult conversations (Zúñiga et al., 2007a). Given that equity literacy can be defined as “the knowledge and skills we need as educators to be a threat to the existence of bias and inequity in our spheres of influence” (Gorski & Pothini, 2018, p. 10), teachers lack equity literacy. When teachers lack equity literacy, it directly affects curriculum and instruction. By becoming aware of biases, the mindset of equity-literate educators shifts to “naturally filter every decision through an equity lens” (Gorski & Pothini, 2018, p. 10). When considering access and participation in a CS/CT curriculum, equity literacy is, therefore, an important frame to consider.

While many educational leaders introduce and even require teachers to implement initiatives, such as CSforALL, they often do not provide the time, space, and support to effectively implement the new initiatives (Woodland & Mazur, 2015a). Research has shown that teachers are often provided with initial resources and training to implement new initiatives but are also left with little follow-up support. When initiatives are completed in the manner described, it is colloquially known as “one and done professional development” in which leaders hold one training, give teachers digital or physical resources (like a binder or book), and then expect teachers to implement the initiative. In this CSforALL RPP, educators, through PLCs are expected at a minimum to address issues of equity related to access and participation. It is essential that the teachers are successful in their collaboration and dialogue for the RPP to meet its goal to provide

CS/CT curriculum to all the students in the District. PLCs are teams focused on an iterative cycle of inquiry and collaborative problem-solving around a problem of practice. The CSforALL RPP communications infrastructure is organized through teams called Professional Learning Communities (PLCs). While the overall RPP functions as a larger PLC that tackles a larger problem of practice, teams within the RPP operate as their own micro-PLCs, engaging in cycles of inquiry and collaborative problem-solving around more specific problems of practice that support the overarching goal of CS/CT implementation and equity.

Purpose of the Study

The primary purpose of the study was to examine how PLC educators in the CSforALL RPP conceived of and addressed equity over time. My framework began with Gorski and Pothini's (2018) four characteristics of an equity literate person: one who can recognize, respond, redress, and create and sustain an environment that addresses inequities and biases in the short- and long-term. I was specifically interested in also analyzing concepts of access and participation that are often first measures of an initiative. I examined the meeting artifacts, such as agendas, meeting notes, and video recordings of three centrally located PLCs in order to understand how equity literacy developed over time. The role of protocols (i.e., structures used to facilitate PLC conversations) were also examined to see if/how they promoted equity literacy.

Research Questions

RQ1: How did the 3 primary CSforALL RPP PLCs conceive of and address issues of equity over time (i.e., Advisory, Coordinator, and Professional Development teams)? Does, and if so how, their equity literacy grow/evolve over time?

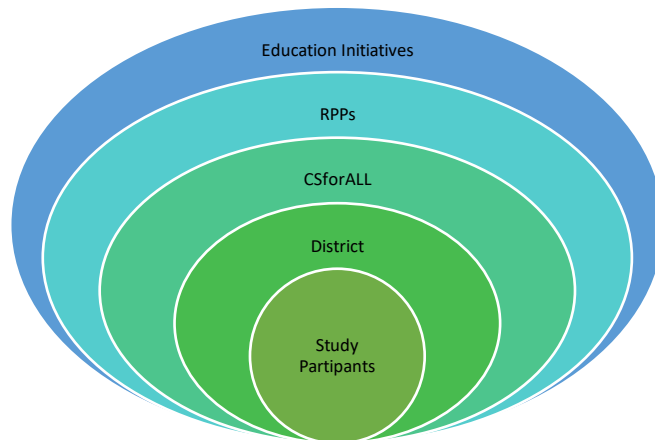
RQ2: How do established protocols conceive of and enable educators to address issues of equity? By established protocols, I mean ones that are readily available on the internet through nationally recognized organizations and foundational texts in the literature on protocols.

Significance of the Study

Research question 1 examined how CSforALL RPPs conceived of and addressed issues of equity. In the CSforALL community, equity is a shared value (Santo et al., 2019). The study supported an understanding of equity in multiple spheres, starting with those directly involved with the study and moving outward to broader educational settings. Figure 2 shows how the study will first impact the RPP members, District, and University involved in the study. Next, the study could impact people involved in the CSforALL movement, then other RPPs, and may potentially influence how other educational initiatives are enacted.

Figure 2

Potential Spheres of Influence for the Research in This Study



Study participants will have an opportunity to read this study, which they could use to reflect on their actions and adjust their conceptualization of how to address equity. Because this CSforALL RPP is starting with a selection of District members, those who are participants in the study will be primarily responsible for disseminating lessons learned to the District at large. The CSforALL RPP members will inform the District members how they conceptualized and addressed equity, which will impact how the District members define, understand, and enact equity District-wide. Members of the CSforALL movement can use this study as an example of how CS is implemented in a preK-5 setting. This study can provide specific examples of how to develop equity literacy as an avenue to address the “forAll” concept. RPPs and other educational initiatives can also learn how dialogic practices about equity can inform the ways in which they upend and reform the systems in which they are operating.

Research question 2 will explore established protocols to assist in improving equity literacy within a CSforALL RPP. Protocols are structured guidelines to support processes of dialogue. Protocols are typically facilitated and have time frames to support the dialogue in a group space, often in PLCs. A recent definition of protocols is “structured processes and guidelines to promote meaningful, efficient communication, problem solving, and learning.” (National School Reform Faculty, 2019, para. 1). The CSforALL community will gain an understanding of how commonly available and established protocols are utilized within a CSforALL RPP. Given that protocols are one of the integral ways in which PLC members engage in dialogue about difficult issues *and* that equity is a lens of the CSforALL RPP, it is essential to review the literature on protocols for their intersection with equity. Results may provide direction as to what and

how protocols could be used by teachers in other initiatives to advance equity in a meaningful way.

Definition of Terms

CSforALL: A program that “aims to provide *all* [emphasis in original] U.S. students the opportunity to participate in computer science (CS) and computational thinking (CT) education in their schools at the PreK-12 levels.” (National Science Foundation, n.d., para. 1).

Critical Dialogue: Critical dialogue is a distinct approach to dialogue across difference. It can be broadly defined as facilitated critical and sustained conversation that seeds to foster a dialogic relationship across social divides and critical examination of social justice issues to transform social realities (Zúñiga et al., 2014). Critical dialogue is also a term used:

To refer to dialogues *about* and *across* differences, where differences are defined by social identities and social inequalities. The recognition and holding of differences in actual dialogues also necessitate engaging *with* a difference (dialogue in contrast to debate or discussion) and *for* making a difference (socially just change in contrast to maintaining inequitable status quo). (Nagda & Roper, 2019, p. 123)

This process requires developing social identity and system-based awareness and understanding of group inequalities and specific dialogic skills and dispositions to engage in critical conversations about controversial topics and to bridge differences and collaborative actions for social justice (Adams & Zúñiga, 2016; Marchel, 2007; Schoem, 2003; Zúñiga et al., 2007a; Zúñiga et al., 2014).

Dialogue: Dialogue is a conversation, “a way of thinking and reflecting together” (Isaacs, 1999, p. 9) It is a process that supports the co-creation of a shared meaning and

mutual understanding among and between participants. Bohm (1996) defines dialogue as:

“‘Dialogue’ comes from the Greek word *dialogos*. *Logos* means ‘the word,’ and in our case we would think of the ‘meaning of the word.’ And *dia* means ‘through—it doesn’t mean ‘two.’ A dialogue can be among any number of people, not just two. Even one person can have a sense of dialogue within himself [or themselves], if the spirit of the dialogue is present. The picture or image that this derivation suggests is of a *stream of meaning* flowing among and through us and between us. This will make possible a flow of meaning in the whole group, out of which may emerge some new understanding. It’s something new, which may not have been in the starting point at all. It’s something creative. And this shared meaning is the ‘glue’ or ‘cement’ that holds people and societies together...In a dialogue, however, nobody is trying to win” (p. 6-7).”

This process also requires developing specific skills and disposition that support collective thinking, reflection, and inquiry in order to create new meanings.

Equity: “Equity is viewed and understood in terms of one’s relations and interactions with others, particularly where disconnects in opportunity, identity, and privilege occur” (Morton & Fasching-Varner, 2015, pp. 435-436)

Equity Literacy: Equity literacy means being able to understand and see within oneself and others biases and inequities and being able to do something about it in the short- and long-term as well as support how to create and sustain that kind of environment for yourself and others. Theoretically, a sense of equity literacy will translate into the development of four abilities. These four are the ability to:

1. Recognize even the subtlest biases and inequities
2. Respond to biases and inequities in immediate terms
3. Redress biases and inequities in the long-term
4. Create and sustain a bias-free and equitable learning environment (Gorski & Pothini, 2018, p. 12).

Identities: Social identity groups are based on physical, cultural, linguistic and/or other characteristics, and to which individuals are assigned based on socially constructed categories, such as race, ethnicity, sex, gender, age, religion, nationality, socio-economic class, sexual orientation, ability/disability status, and first language (Adams et al., 2007). Identity is complicated, and it is formed by a number of different contexts, such as history, family, social, and political. There are personal and social identities; these are influenced by the contexts of the situations, socially constructed and are intersectional, which means how different identities and aspects of those identities overlap.

PLCs: Professional Learning Communities. Teams of teachers that are created to engage in iterative cycles of collaborative problem solving around a problem of practice.

Protocols: Protocols are structured guidelines to support processes of dialogue. Protocols are typically facilitated and have time frames to support the dialogue in a group space, often in PLCs. A recent definition of protocols is “structured processes and guidelines to promote meaningful, efficient communication, problem solving, and learning.” (National School Reform Faculty, 2019, para. 1).

RPP: Research Practitioner Partnership; RPPs are “long-term, mutualistic collaborations between practitioners and researchers that are intentionally organized to investigate problems of practice and solutions for improving district outcomes” (Coburn et al., 2013, p. 2).

Systemic oppression: Oppression embodies “the interlocking forces that create and sustain injustice” (Bell, 2018, p. 35). Oppression is “restrictive, pervasive, and

cumulative; socially constructed, categorizing, and group based; hierarchical, normalized, and hegemonic; intersectional and internalized; and mutable” (p. 35).

Positionality

I am a seventh-year doctoral candidate in the educational leadership department. I am a second-generation college student and the first in my family to earn a PhD, though the second to earn a doctoral degree. I am a Puerto Rican who was born and raised in various locations along the east coast of the United States, as my father served 24 years in the United States Air Force. Though I identify as a person of color, I am often misidentified as White, which means that folks do not often perceive me as a person of color. I speak English with no accent though I am fully bilingual, and people are often surprised to learn I speak Spanish. I often hear comments, such as “You don’t look/sound Puerto Rican.” I also understand that as a graduate assistant, many people make assumptions on my levels of expertise, assuming I am young and inexperienced because I am a student, and there are intersectional assumptions people make about students. I am an avid learner and expect growth as I continue in my work and life; to support the work for the research, I am toward the end of my doctoral studies and was a teacher for 6 and a half years in the District of the CSforALL RPP. These are valid and useful experiences and knowledge expressly related to researching this District and learning more about this RPP. I have become more outspoken in meetings and in areas in which I can support the RPP through the evolution of the grant as well. I have led individual interviews, co-led group interviews, lead and co-lead professional development for the teachers and instructional leaders of the RPP, and supported the development of the protocols and structure alongside the instructional leaders and other RPP members.

I have worked with the CSforALL RPP since October 2018. I was brought on as a graduate assistant for the Collaboration Research Team led by Dr. Rebecca Woodland, a co-principal investigator on the CSforALL RPP. As a graduate assistant, my primary role is to support the research questions for our team as well as support the principal goals of the RPP. As time has passed in the RPP, I have become a critical friend of the teachers who serve as instructional leaders and coordinate in the CSforALL RPP. In my capacity as a critical friend, I strive to be encouraging and supportive but also provide straightforward feedback when appropriate, as well as help hold space for the Coordinator PLC to process and reflect on their own cycles of inquiry and collaborative problem-solving and growth. I have also been a participant-observer and member of the Advisory PLC and Professional Development PLC since their inception and a member of the Equity Task Force for some of its existence. Rapport has been built over time, working closely with the PLC members and in particular with the instructional leaders of the Coordinator Team, with informal relationships being built, too.

Summary

The first chapter of this dissertation introduced Computer Science for All (CSforALL) as an important initiative that highlights the need to bring CS education to *all* students, therefore, prioritizing equity for those responding to this initiative. In this chapter, I reviewed the background of the problem—student access and participation in CS. I then connected this background to the problem itself, equity literacy when trying to implement high quality CS/CT curricula for all students, specifically in the District of the study. Next, I reviewed the purpose of this study, namely, to examine conceptions around equity within a Research Practitioner Partnership (RPP) focused on CSforALL.

Secondarily, this study aimed to review established protocols to see if/how they could support equity literacy as well. Next, I listed my research questions and envisioned the significance of this study. I also defined terms that are essential in understanding the context and theory of this research. Lastly, I expanded on my positionality within and outside of the study and the ways in which my identities may or may not influence my lens as a researcher.

CHAPTER 2

LITERATURE REVIEW

Introduction

The work within schools is inextricable from the political contexts that exist at every level, from federal to local. Freire (1970) noted, “There's no such thing as neutral education. Education either functions as an instrument to bring about conformity or freedom” (p. 34). While there are larger systems in action, it is at the local level where academic and political theory become educational actions that impact students directly. Various organizations are working together to address the problem of access and participation of preK-12 students in CS/CT, particularly for those of the global majority, those with (dis)ability, and women. The demand to find a solution to this problem has led to CSforALL RPPs being funded by the NSF, like the RPP in this study. However, there are gaps that need to be addressed within CSforALL RPPs, for instance, teachers’ understanding of equity literacy.

In order to better understand if and how CSforALL RPP PLC (Computer Science for All, Research Practitioner Partnership, Professional Learning Communities) members conceived of and addressed equity literacy, I needed to delve more deeply into the PLC and dialogue literature. Therefore, I reviewed literature about PLCs, critical dialogue, and how dialogue in PLCs and critical dialogue compared which informed my first research question. For my second research question, I reviewed literature regarding protocols, as they are commonly used by PLC members. I used academic databases, such as Academic Search Premier and ERIC, available through the UMass Library services to search for key terms, such as “professional learning communities,” “critical dialogue,” “dialogue,”

and “education protocols.” I also searched for work by authors that kept being listed in references when I found articles and book chapters that helped clarify my understanding. I searched for early texts as well as more recent texts until I reached literature saturation. Literature saturation, for me, meant that the texts were beginning to cite each other as their grounded work, and the authors were core in each other’s understandings.

One of the first areas of literature I investigated was that of PLCs. Within the larger systems of schooling in the US, educational leaders are key responsible actors for change in their local systems. When educational leaders are implementing change in complex school systems, they will often have to use a layered approach; there is not one way that can solve all the dilemmas within schools. A primary and powerful lever for school improvement often used by educational leaders are Professional Learning Communities. PLCs are predicated on the widespread creation of teacher teams that engage in iterative cycles of collaborative problem-solving around a problem of classroom practice. PLC teams are predicated on the quality of dialogue. Dialogue is co-creating and developing a shared meaning. Dialogue in PLCs are about students, current policies, or teaching practices they are using, or at times, other logistics related to teaching. The dialogue in PLCs is typically about teaching practices, shared students, or policies being implemented in the school. Protocols are one of the ways in which PLCs can strengthen their dialogic practices. Protocols are structured guidelines to support processes of dialogue. For example, how to talk about an artifact or topic that may be uncomfortable, protocols provide a framework and socially agreed on boundaries about how to hold a conversation. When using a protocol, members have equal time voicing their thoughts and opinions, have time for processing, and protocols can proportion the

time equally so all voices can be heard. However, current and typical PLC-based dialogue may need not have the capacity to advance notions of equity or the kind of critical and reflective dialogue that would support the goal of disrupting socially unjust practices in schools and their local systemic oppressions.

I review critical dialogue as a critical social justice education praxis (Zúñiga, et al., 2014). Critical dialogue seeks to develop shared meaning about the impact of systems of oppression on social issues and group relations. Critical dialogue encourages participants to act in their spheres of influence. To incorporate critical dialogue within PLC-based dialogue would require learning about how systems of oppression benefit some and marginalize others—in effect, an evolution to becoming equity literate and engaging in praxis. Members would have to think about how the work being done challenges some of the ways in which “members of dominant social groups, whether knowingly or unconsciously, perpetuate their own social and cultural privilege to the disadvantage of marginalized or subordinated social groups” (Adams & Zúñiga, 2016, p. 97). Critical dialogue practices use a range of modalities in educational settings and communities (Zúñiga et al., 2014). Understanding critical dialogue furthered my thinking about what PLC dialogue could look like if a PLC were to take on issues of social justice, such as in the CSforALL RPP.

Systems: Professional Learning Communities

One of the primary mechanisms used to affect school change is Professional Learning Communities, or PLCs. PLCs are a school improvement practice that incorporates and emphasizes teacher collaboration. Educational initiatives have often been hierarchal and have regarded teachers and students as passive implementers of the

initiatives (Fullan, 2006). PLCs shift the dynamic and center teachers as active to the development of how change will happen. Various states have implemented evaluation systems that are intended to create cycles of formative and summative professional development and feedback for teachers to help them develop professionally. PLCs have proven to be an established method of incorporating iterative cycles of inquiry for teacher improvement as well as school improvement. Considering that teachers are the most important factor in student achievement (Peske & Haycock, 2006), improving teachers' effectiveness and depth of understanding in their own practice is vital work in the field of education. Instead of Lortie's (1975) notion of the "egg-crate" model by which teachers are individuals (like self-contained eggs) in a crate (the school building), PLCs strive for an integrated, concerted effort to improve and recognize that, like is asked of our students, education is a process, not simply a goal (DuFour, 2004; Fullan, 1999; Gajda & Koliba, 2008; Seashore Louis et al., 2010).

Collaboration and the underpinnings of PLCs began with work being done in the academic sphere as well as the business sector in the US in the 1980s - early 1990s. While these systems-thinking ideas were gaining traction in the business sector, the education field began focusing on workplace culture and its effect on teachers. PLCs are an established standard in education, as they have proven effective as a lever to improve schools (DuFour et al., 2005).

[One of the ways in which PLCs have been defined is:] educators committed to working collaboratively in ongoing processes of collective inquiry and action research to achieve better results for the students they serve. PLCs operate under the assumption that the key to improved learning for students is continuous, job-embedded learning for educators. (DuFour et al., 2006, p. 2)

When PLCs are done well, the benefits are proven indicators of school improvement. PLCs can also help create a better teacher working environment and can help reduce teacher attrition (Darling-Hammond, 2003). The recent legislation Every Student Succeeds Act of 2015 repealed No Child Left Behind (2002) and supports job-embedded professional development (meaning that the development professionally happens within the workday); “ESEA section 8101(42) defines ‘professional development,’ specifically noting that the professional development activities are sustained (not stand-alone, 1-day, or short-term workshops), intensive, collaborative, job-embedded, data-driven, and classroom-focused” (U.S. Department of Education, 2016, p. 11). PLCs qualify as professional development under ESSA’s definition. Furthermore, PLCs are structured with systemic cycles of inquiry and collaborative problem-solving. For teachers, the cycle of inquiry is about focusing on what is happening in their classrooms. As its name suggests, it is cyclical in nature, beginning and ending with questions and following steps, such as planning the questions participants have, collecting data relevant to the questions, analyzing the data, interpreting, acting, and changing behaviors, and then evaluating how those changes in actions impact the question; new questions may arise and the cycle continues (Rallis & Rossman, 2012; Woodland & Mazur, 2015b). Cycles of inquiry and collaborative inquiry are supported as part of initiatives to help teachers, such as PLCs have proven effective for change in classrooms.

PLCs are characterized by shared values, vision, norms, collaborative work, deprivatization of practice/shared practice, distributive leadership, collective focus on student learning, use of reflective dialogue, and supportive conditions (Eaker et al., 2002; Hord, 2004; Seashore Louis et al., 2010; Woodland & Mazur, 2015a). PLC benefits

include increased teacher collaboration and teacher job satisfaction, an improved sense of self-efficacy, reduction of teacher isolation, and an increase in student learning as measured by student standardized test scores (DuFour et al., 2005; Vescio et al., 2008).

Woodland (2016) stated that the hallmark of PLCs is that:

By working together with other professionals with experience in the same subject and/or similar students, teachers use evidence about student performance as the center of structured dialogue to make decisions about how to change their teaching method and to then take actions in the classroom that lead to new heights of achievement for learners. (p. 507)

Woodland noted above how teachers come together to collaboratively problem-solve and work toward targeted change for improvement.

Assessments of PLCs can help participants self-evaluate and educational leaders evaluate how the PLC team is doing and where it can improve. A survey of 49 tools to evaluate PLCs by Blitz and Schulman (2016) found that “Most of the PLC-related instruments were designed to measure teacher/principal-level variables, such as beliefs and self-reported behaviors. Far fewer instruments were designed to measure team- or school/student-level variables” (p. 4). There seems to be no focus or established assessment about how dialogue within PLCs may address issues of social justice or by design, engage in critical dialogue.

As a school improvement strategy, PLCs work to better schools through participant collaboration in dialogue to process their work within a structured cycle of inquiry. PLCs have been firmly established as a demonstrated practice for improvement, helping participants and students in schools in which PLCs are being enacted. Members are often teachers but may also include other members of a school or district. The literature on PLC-dialogue shows that primary focus is on teaching practices and working

with students. For the purposes of my study, I was interested in learning if and how social justice issues, namely equity, are being addressed by PLC members of the CSforALL RPP. Therefore, I needed to examine literature on the criteria used to evaluate or assess PLC. When reviewing the literature, I found that there are various validated tools to evaluate PLCs, but there are not evaluation tools that expressly assess issues of social justice.

Dialogue is an essential element of the work of PLCs. PLCs are, at their core, collaborative spaces that provide sustained dialogue around shared values, visions, norms, and goals as part of their structure (Lavié, 2006). Blitz and Shulman (2016) explained PLCs as “teams of educators (most commonly teachers) who meet regularly (often but not always during scheduled school time) to develop lesson plans, examine student work, monitor student progress, assess the effectiveness of instruction, and identify their professional learning needs” (p. 1). When evaluating the dialogue that occurs within PLCs, the focus of the literature primarily identifies teachers talking among themselves about their teaching and students’ work (Bryk et al., 2010; Darling-Hammond & Richardson, 2009; DuFour & Marzano, 2009; Woodland, 2016; Woodland & Mazur, 2015a) .

Critical Dialogue

I am particularly interested in the kind of dialogue that took place among PLC members of the CSforALL RPP because it is in the PLCs that members will be conversing about *how* the RPP as a whole will implement CS for all the students in the District under study. The practice of dialogue has its roots in cultural and philosophical traditions that have valued collective conversation as a method of communication,

inquiry, and praxis (Zúñiga et al., 2007a). Increasingly this practice is used in educational and community settings to explore identity-based and social justice issues to mediate and transform conflicts and to deliberate on policy issues (Zúñiga et al., 2014). The practice of dialogue is grounded in Indigenous peoples' traditions, when a people come together and talk in ways that Westerners may see as pointless conversation, to create shared meaning (Ellinor & Gerard, 1998). It is also anchored in the works of Socrates, Plato, and Aristotle, in particular, the Socratic Method (Ellinor & Gerard, 1998; Preskill & Brookfield, 2005). In education, the practice of dialogue can be traced to the progressive democratic movement inspired by the work of John Dewey during the 1930s-1950s (Zúñiga et al., 2007). Dewey's conceptualization of dialogue as a deliberative process aimed at fostering the capacity and dispositions of learned to participate in such deliberations (Burbules, 2000). Later, in the late 1960s Paulo Freire's concept of critical dialogic praxis became core to the critical pedagogy and intergroup dialogue movement, which aimed to empower students in classrooms and marginalized social groups in communities to challenge social inequities in the United States and globally (Zúñiga et al., 2007a).

As stated in Chapter 1, dialogue is a process aimed at co-creating and developing a shared meaning and mutual understanding. Bohm (1996) described dialogue as “a *stream of meaning* [emphasis in original] flowing among and through us and between us. This will make possible a flow of meaning in the whole group, out of which may emerge some new understanding” (p. 6). In contrast, critical dialogic practices refer to dialogues *about* and *across* differences, where differences are defined by social identities and social inequalities (Nagda & Roper, 2019, p. 123). The impetus of critical dialogic practices is

to recognize and engage with social identity and status differences with the goal of transforming social inequities and bridging social divides (Gorski, 2018; Nagda & Roper, 2019; Zúñiga et al., 2014) Both dialogue and critical dialogues require building capacity and dispositions to listen deeply and engage in conversation across diverse perspectives, gaps in communication, and conflicting points of view (Zúñiga et al., 2014). Critical dialogue requires self and social identity-based awareness, micro-macro levels of analysis, and skill sets to promote mutual learning, collaboration across differences, and social action (Adams & Zúñiga, 2016; Marchel, 2007; Schoem, 2003; Zúñiga et al., 2007a).

Paulo Freire (1972) is perhaps one of the most important contemporary contributors to the critical dialogic literature in education in the US and globally. His work is grounded in the popular education tradition in Latin America, which seeks to foster a critical understanding of social realities with the goal of creating radical changes. Freire's concept of critical praxis is inherently dialogic and creates change. Freire's (1970) critical pedagogy and notions of praxis and conscientization brought a social justice framework to educational pedagogy. "Authentic education is not carried on by 'A' *for* 'B' or by 'A' *about* B," but rather by 'A' *with* 'B,' mediated by the world" (p. 93). His idea of conscientization "refers to learning to perceive social, political, and economic contradictions, and to take action against the oppressive elements of reality" (p. 35). Further, praxis is "reflection and action upon the world in order to transform it" (p. 51). When dialogue incorporates praxis, it can shift participants' perceptions of the world from one of passive complacency to one of active thinking, and potentially to one of taking action in the world to make change.

In a PLC context, I understand the term critical dialogue is practice that seeks to investigate the power dynamics present in schools and the school curriculum and challenges practices that exclude the experiences of marginalized with the goal of creating shared understandings of the problem among participants from diverse social groups. Critical dialogue can be seen as a process that encourages critical reflection or critical inquiry. However, Brookfield (1995) astutely noted that “Reflection is not, by definition, critical” (p. 8) and, therefore, when considering the language of reflection, inquiry, or dialogue, it may or may not be critical as I have defined. Brookfield elaborated:

Reflection becomes critical when it has two distinctive purposes. The first is to understand how considerations of power undergird, frame, and distort educational process and interactions. The second is to question assumptions and practices that seem to make our teaching lives easier but actually work against our best long-term interests. (p. 8)

In a CSforALL RPP, critical dialogue and the development of equity literacy calls participants to action—participants must be willing to develop awareness of inequities, to dedicate themselves to the process of learning, and to grow and problem-solve within their local contexts. Critical dialogue is different from critical reflection or inquiry because it is a conversation with others to create meaning and understandings together. Critical dialogue practices seek to build “the capacity to critically examine social hierarchies and dominant beliefs and explanation” and “the capacity to free oneself and help others to free themselves from oppressive scripts and habits through authentic dialogues, problem posing, and reciprocal and empowered relations” (Zúñiga, Lopez & Ford, 2014, p. 8). In supporting participants to get ready to engage in dialogues across social identity-based differences, critical dialogic practices (commonly referenced as IGD dialogues) draw heavily from the field of social justice education. Adams and Zúñiga

(2016) synthesized the seven core concepts of social justice education as follows: 1) diversity approach is distinct from social justice approach; 2) the pervasiveness of systems of oppression; 3) the social construction and legacies of oppression; 4) the socialization processes by which oppression is learned and reproduced; 5) individual and group identities in the context of socially constructed categories and positionalities of privilege and disadvantage; 6) intersectionality among social identities, social group memberships, and institutional forms of oppression; 7) and the importance of critical awareness, knowledge, and skills to challenge, resist, and take effective action for change. The seven core concepts influence the practice of critical dialogue in a variety of ways. For instance, when considering the difference between a diversity approach and a social justice approach, the social justice approach “requires not only a recognition of *social group differences* [a diversity approach] but also an understanding of how social differences...are connected to *social group inequality* [emphasis in original]” (Adams., 2018, p. 2).

In supporting the flow of communication, critical dialogic practices increasingly draw from the work of David Bohm, a quantum physicist who later in life turned his attention to dialogue and underscore the importance of building a dialogue container that embraces key “building blocks” of dialogue: suspended judgment, deep listening, identifying assumptions, and reflection and inquiry (Bohm, 1996). Other theorists, particularly women of color, have underscored the importance of “voicing” in dialogue (hooks, 1994). Still others have stressed “respect” as an essential building block in dialogue (Isaacs, 1999). In a CSforALL RPP PLC, in order to address equity, members would have to allow for the kind of dialogue that protocols promote—active listening,

silent reflection, directly questioning and perhaps challenging of norms and someone to facilitate and curate these kinds of actions in the space, a participant-facilitator.

Suspension of judgment is about holding potentially conflicting ideas—being open to differing ideas/opinions/feelings without judgment of self or the other person (Ellinor & Gerard, 1998; Weiler, 1994). Deep listening is about being present, not getting caught up in our internal monologue and reactions (Weiler, 1994). Respect is not about authority in a dialogue space; instead, it is about honoring boundaries for yourself and other participants (Isaacs, 1999). Identifying assumptions is about creating awareness of what assumptions one may have and recognizing/surfacing assumptions so that they are explicit as opposed to implicit in the dialogic space (Weiler, 1994). For inquiry and reflection, it is about maintaining curiosity, allowing space to process, and generating new questions from the dialogue (Ellinor & Girard, 1998; Freire, 1970; hooks, 1994; Isaacs, 1999; Weiler, 1994). Voicing intends to have one engage in speaking for self (which ties to identifying assumptions) and thinking about the intentionality of speech and trusting ourselves (hooks, 1994; Isaacs, 1999). Respect is about mutual consideration and appreciation among participants and treating each other with empathy to build trust (Zúñiga, Chesler, et al., 2007). An example of critical dialogue that fosters the use of all the building blocks while exploring complex issues is IGD. IGD incorporates a critical-liberatory pedagogy and feminist pedagogy, and brings in the foundations of a social justice perspective and multicultural education (Keehn, 2015; Zúñiga, Lopez, & Ford, 2014; Zúñiga et al., 2007). Recent empirical research demonstrates the importance of voicing, engaged listening, inquiry, and reflection in intergroup learning and social justice education outcomes (Gurin et al., 2013; Stassen et.al., 2013; Zúñiga, Mildred et

al., 2012) Stassen et al. (2013) found that participants in race-ethnicity and gender IGDs were moved to engage in three ways—listening, speaking, and active thinking. The authors defined engaged listening as “taking in and trying to understand the meaning of what is being said” (p. 217). Speaking was defined as speaking authentically in the moment during the dialogues. Active thinking was seen as occurring “when participants were engaged in cognitive processing and meaning-making through dialogue. It involved analysis and self-reflection” (p. 231). Stassen et al. suggested that IGD structures support a change in participants—that they are able to engage in cognitive processes that help them to gain insights for themselves and their own identity groups and other identity groups. There is frequently apprehension surrounding talking about express differences and topics, like race, gender, religion, and class, for instance. Critical dialogue, like that which occurs in IGDs as confirmed by Stassen et al., aligns with a purpose for teaching methods that disrupt unjust practices. The mechanism for disruption *is* dialogue across differences to build connections and transformation for those involved in the dialogue. Dialogue in which the conversation is held, and judgment is suspended allows for deeper listening (Weiler, 1994; Zúñiga et al., 2007). Understanding critical dialogue furthered my thinking about what PLC dialogue could look like if a PLC were to take on issues of social justice, such as in the CSforALL RPP.

Comparison of PLC Dialogue and Critical Dialogue

When thinking of critical dialogue in the classroom, Brookfield (1995) noted, “[C]ritical reflection urges us to create conditions under which each person is respected, valued, and heard. In pedagogic terms, critical reflection means the creation of democratic classrooms. In terms of professional development, it means an engagement in

critical conversation” (p. 27). The call for teachers to do critical work is not new (Darling-Hammond, 2015; Marchel, 2007; Paris, 2012; Picower, 2015; Servage, 2007). Senge (1990) affected many aspects of organizational management—both PLC and IGD literatures cite the work of Senge’s (1990) *The Fifth Discipline* as part of how PLCs or IGD foundationally operate systemically. Participants/teams build shared meaning and think of how the team can grow, work together, and learn from each other as a team (or sustained group of participants for IGD), and raising awareness of where there might be disconnects (in assessments for PLCs and differences in IGD). Both PLCs and IGD commit to cycles of learning, stressing the process of learning as opposed to a product of the participants’ learning. Dialogue is key for both as well. Senge talked about how there needs to be a chance for the team members to suspend assumptions and think together, creating shared meaning as is intended and structured within IGD practices.

Table 1 is a summary of the main concepts of the building blocks or essential structures from Senge’s (1990) *The Fifth Discipline*, PLCs, and critical dialogue within IGD share similar concepts. I synthesized the concepts from the literature on PLCs and critical dialogue in earlier sections of this chapter

Table 1*Comparison of PLC-based Dialogue with Critical Dialogue*

	PLC-based Dialogue	Critical Dialogue, such as IGD
Participants	PreK-12 professional employees are typically the involved participants; identities often overlap	Participants are from multiple social identities and may not share any identities with other members
Purpose	Focused on teaching practices to provide students access to the best possible classroom or school experience; specific instructional practices and student learning information is often the focus of the group	Members engaged in dialogue for their personal betterment and for their community at large
Kind of Dialogue	Debate and discussion can be an integral part of the process	Debate and discussion are not generally a part of critical dialogue; silence is welcomed in the space and framed as part of processing
Time	Time-bound: limited resource of meeting time as well as the school year	Critical dialogue does not have a time limit; however, IGD typically is structured to run 6 or more weeks; time is variable as needed
Documentation	A clear record and documentation of the processes are kept and accessible to all	Documentation of the meetings is not necessary, privacy and confidentiality also further support not documenting details, but general concepts of what occurred if needed and primarily for process purposes as opposed to the intention of recordkeeping
Action	Action by participants is required	Action by participants is not required

PLCs share some similar purposes in dialogue that occur within critical dialogue. Both are aiming to improve relationships across varying dynamics with the intention of making a positive change and increased awareness (though the topics of awareness vary, refer to Table 1); they both are drawn to act as a natural response to their dialogue, though action is not required in IGD. When PLCs dialogue they are talking about a problem of practice with the intent to find a solution. If the goal is to bridge dialogue and action, like in some community dialogues and courses, then some of the work is focused on problem-solving. Critical dialogue incorporates what PLC dialogues do, while highlighting that identity and ideological differences must be attended to among the group members. Critical dialogue tends to bring in the differences to the conversations and to grapple with issues of power in the group dynamics and, therefore, ensure equity

within the membership. Furthermore, the action orientation in critical dialogue tends to be more focused on disrupting unjust practices as opposed to the refinement of teaching practices and student learning. Table 1 shows similarities and differences between PLCs and critical dialogue, specifically around the participants, purpose, kind of dialogue, time allotted for the dialogue, documentation of the process and action that may or may not occur. At their core, both want to create change and part of enacting that change is through dialogue. PLC dialogue is limited by context and in particular time and in general, a focus on student work only. In PLC-based dialogues, participants typically have at least one shared title, such as that of educator, whereas in critical dialogues, identities tend to vary, though there may be one unifying identity as might happen for a race/ethnicity dialogue for women, in which case, all participants in the dialogue are women. PLC-based dialogue is typically focused on instructional practices for student achievement, and critical dialogue focuses on individual and potentially systemic issues of social justice. Both PLC-based and critical dialogue share that disagreements are expected and addressed with agreed upon norms. PLC literature explains that “[h]ighly developed teacher teams will engage in collective dialogue about student learning, the effects of instruction on student achievement, and how to provide an appropriate level of challenge and support to every student” (Woodland et al., 2013, p. 444). The strategy of exploring teacher-related factors that can influence a student’s ability to learn aligns with critical dialogue.

In dialogue for PLCs, DuFour et al. (2005) mentioned dealing with issues in an open format and “applying positive peer pressure to bring about the desired change” (p. 144). Dialogue, here, is used within the team as opposed to seeking the authority of a

principal or supervisor to address an issue. Having dialogue with a distinct purpose is in line with a social justice framework of the greater notion of making schools more democratic and improving. However, the purpose is quite distinct in that in a dialogue within the set time and decision-making process of a PLC could potentially cause participants to agree as a way to avoid conflict. Critical dialogue, such as in IGD, does not necessarily need to resolve conflict but does go toward conflict in its choice of topics, like race, gender, or class. Facilitators are trained to surface conflict expressly to help participants navigate the tensions, even if the tensions do not get resolved. Tensions do get named, surfaced, and space in the group is made so that the tensions can potentially be addressed, which *could* lead to a resolution. Further, while IGD does usually have a sustained structure of about 6 weeks, time is not as limiting a factor as with PLCs. Conflict is a necessary part of dialogue (DuFour, 2004; Gajda & Koliba, 2008; Woodland, 2016). Achinstein (2002) defined conflict as “social interaction process, whereby individuals or groups come to perceive of themselves at odds” (p. 425). Addressing conflict is part of a social justice critical framework because, like PLCs, IGD and critical dialogue expect conflict and strive to stay in the dialogic space and navigate the conflict in a non-violent, connecting way to support those involved. Achinstein’s study showed that one school valued consensus so much that the solution was to get rid of people who did not agree. The other school in her study had a social justice framework and valued dissent, but other elements for sustained dialogue were missing so that turnover at the school and frustration remained high.

While conflict in dialogue is expected within PLCs and critical dialogue spaces, such as IGD, expectations of how to address it are more structured within an IGD critical

dialogic space. Stage 1 (Zúñiga, Nagda, et al., 2007) explains that disagreements are directly addressed as part of the readings, norm development, as community-building that is part of the design. Norm developing can happen in PLC dialogue, but it is not necessarily required. PLC dialogue and critical dialogue, such as the kind that occurs within IGD, have overlaps and differences as noted above.

PLC-based dialogue occurs within a cycle of inquiry. To understand the extent and ways the literature about PLC-based dialogue addresses issues of social justice and critical discourse, it is important to understand the PLC cycle of inquiry. A PLC cycle of inquiry incorporates dialogue, decision-making, action, and evaluation (DDAE) around a shared purpose (Woodland, 2016).

PLCs espouse a structured dialogue format within a cycle of inquiry (DuFour, 2007; Woodland et al., 2013). The PLC team dialogues about their purpose, which is usually team defined (Woodland, 2016) they then move to decisions based on the dialogue. They then collectively act and return together with artifacts and data to evaluate how they did on their chosen action. As participants evaluate their actions then leads to more dialogue about their practice and the cycle continues. In Woodland and Mazur (2015a), dialogue is discussed as being a goal-oriented conversation with targeted outcomes and reflection to make strategic decisions about teaching and curriculum methods. Understanding the cyclical nature of dialogue helps one understand how a group can move toward change, but it is also important to think about how the dialogue itself can be assessed to identify the areas included in dialogue.

Exploring the ways PLC collaboration and dialogue are assessed can also help understand what *is not* included, too. One validated tool that defines PLC-based dialogue

is the Teacher Collaboration Assessment Rubric (TCAR) (Woodland, 2016). The TCAR is not the only evaluation tool; there are a number of tools that help assess PLCs. Blitz and Shulman (2016) identified “49 relevant instruments—31 quantitative and 18 qualitative—that measure a range of teacher/principal-, team-, and school/student-level variables that assess one or more dimensions of Professional Learning Communities (PLCs)” (p. D-1), one of them was the TCAR. According to Woodland’s (2016) TCAR, high marks in the area of dialogue denote that a PLC meets the following criteria:

An agenda for team dialogue is pre-planned and accessible to all in advance of every team meeting; the team meets regularly, and all meetings are attended by all members; team meetings are always structured. Protocols are used to facilitate and guide team dialogue; team dialogue consistently addresses essential questions of practice, instructional quality, and student learning; inter-professional disagreements about issues of practice are typical. These disagreements are expected, openly examined, and thoughtfully discussed; team members participate equally in group dialogue; there are no hibernators or dominators; an accurate record of team dialogue, decisions, and subsequent actions is recorded and accessible to all members (Woodland, 2016, p. 511).

Not included in the rubric are the ways in which PLC-based dialogue may incorporate critical dialogue. There is overlap in social justice critical discourse perspectives that tend to overlap with PLC literature. An example is the term “critical reflection.” In PLC literature, critical reflection is used to mean teachers reflecting on student work and used for teachers to assess their teaching practices. It does not seem to include “critical reflection,” like what is done in more social justice-oriented spaces, like in IGD. PLC-based critical reflection in the literature seems to mean analytical consideration on the work that has occurred or is occurring. Implementing a critical dialogue approach in PLCs’ dialogue would be to include reflection on how the work done/being done challenges ways in which “members of dominant social groups, whether knowingly or unconsciously, perpetuate their own social and cultural privilege to the disadvantage of

marginalized or subordinated social groups” (Adams & Zúñiga, 2016, p. 95). Critical reflection in both senses is not interchangeable.

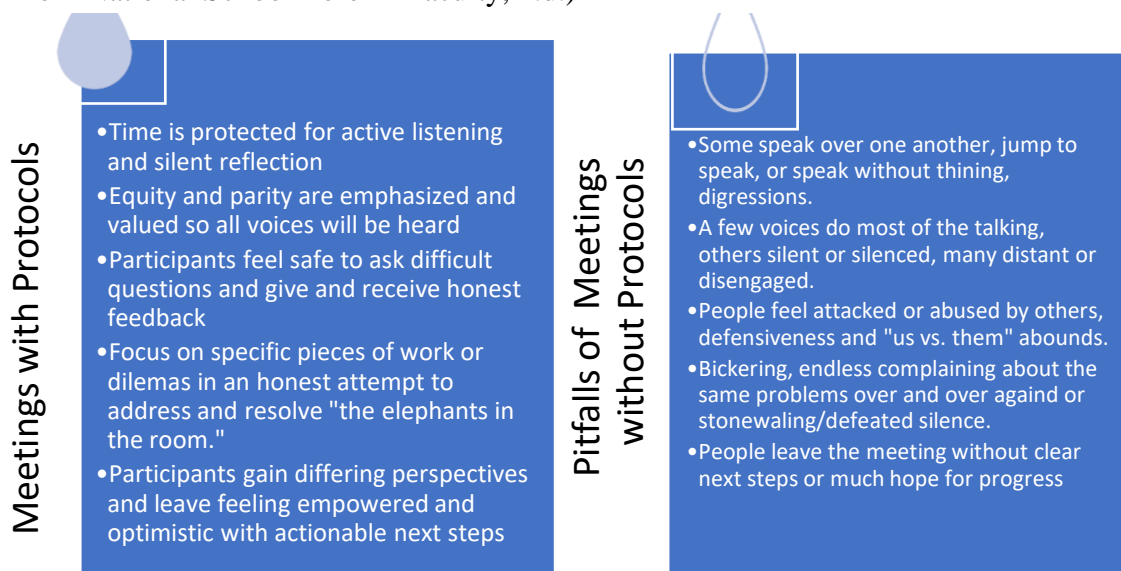
Overall, it is clear that PLC-based and critical dialogue share some similarities, such as those based in Senge’s (1995) work or in vocabulary, such as critical reflection. They also have clear differences, such as those explained in Table 1 in how and who is engaged in the space of dialogue. This section considered what PLC-based dialogue is and what critical dialogue could look like as well. To understand how these can further inform each other, the next section explores protocols as possibilities of PLC-based dialogue and critical dialogue.

Protocols

One method used to structure dialogue and critical dialogue is the use of protocols. Protocols are step-by-step guidelines that structure participants’ dialogue around a common theme. Figure 3 explains the potential ways in which protocols can

Figure 3

Comparing the Productivity and Potential of Critical Friends Group Collaboration (adapted from National School Reform Faculty, n.d.)



impact participants' experiences during a meeting with and without its use. In Figure 3, I adapted the NSRF's chart that compares the productivity and potential of critical friends' group collaboration. A critical friends' group (CFG) is a type of PLC that "consist of 5-12 members who commit to improving their practice through collaborative learning and structured interactions (protocols) and meet at least once a month for about two hours" (National School Reform Faculty, n.d., para. 1).

Figure 3 shows that when CFGs (a type of PLC) use protocols, there should be positive effects on the meeting. With protocols, there is a balance in the meetings for both active listening and silent reflection, people feel safe to ask questions and engage with each other honestly in providing and receiving honest feedback, and the work is dedicated to the chosen focus of the group. When participants leave the meetings, they are able to "gain differing perspectives and leave feeling empowered and optimistic with actionable steps" (see Figure 3).

A protocol is usually, but not always, set up with the following elements: purpose of the protocol, supplies the facilitator will need, instructions and tips on how to facilitate the protocol as well as how much time each part of the protocol might need. Figure 4 is an example from the School Reform Initiative, a well-established source for protocols. A protocol frames the topic for the dialogue around the problem of practice. For instance, if a PLC existed where members chose to focus on increasing their students' computational thinking, an artifact could be brought to the group and the PLC members could use the Tuning for Equity Protocol shown in Figure 3. The PLC members engaged in their dialogue would be able to have a focused conversation on the concrete artifact that would assist in the creation of shared meaning and clarification of abstract concepts such as

“equity” and “computational thinking”. thinking, an artifact could be brought to the group and the PLC members could use the dialogue would be able to have a focused conversation on the concrete artifact that would assist in the creation of shared meaning and clarification of abstract concepts, such as “equity” and “computational thinking.”

Other aspects often found in protocols are the opening or set up, followed by guided parts of conversation, a time for closing or reflecting/debriefing the experience.

The opening or set up gives the participants the information they need to be able to understand the purpose of the dialogue, what the structure will be and the time frame for each section of the protocol activity. The guided parts of the protocol are structured with questions to facilitate the conversation and the timeframe for the various questions. The last part of the protocol is often pressed for time but very important, the debrief or reflection. It is very important that the participants have time to process the conversation they had and allows for closure of the dialogue at least for the time available.

In general, use of protocols assists in providing rules of engagement for conversations as well as pace for the conversations. While pacing a conversation may not necessarily be a high priority for more discursive practices, teachers notoriously have limited time. A structured and paced conversation engages teachers in a mechanism that is mindful of time. Protocols typically have sections within the activity that are broken down by time and encourage both large group and small group discussions around the chosen theme, such as a student’s artifact, a text, or a topic.

Figure 4

Tuning for Equity Protocol (School Reform Initiative, 2017) (continues on the next page)

Tuning for Equity Protocol

Tuning Protocol developed by Joseph McDonald and David Allen, with adaptation for equity focus by Mary Hastings.

1. Introduction (5 minutes)

- Facilitator briefly introduces protocol goals, guidelines, and schedule
- Participants briefly introduce themselves (if necessary)

2. Presentation (15 minutes)

The presenter has an opportunity to share the context for the student work:

- Information about the students and/or the class — what the students tend to be like, where they are in school, where they are in the year.

Descriptions of the students grounded in evidence the way descriptions are shared in the Collaborative Assessment Conference would be useful here. This might eliminate predisposing the participants to a particular “view” of the class or students in question.

- Assignment or prompt that generated the student work
- Student learning goals or standards that inform the work

Potential clarifying questions might be, “How are all students being served with this assignment?” or “How was it ‘differentiated’ for the members of this particular class?”

- Samples of student work — photocopies of work, video clips, etc. — with student names removed.
More questions to consider: How did the presenter select the work? Was it truly random? Does it represent not only the range of learning, but also the range of diversity in the class?

- Evaluation format — scoring rubric and/or assessment criteria, etc.

Questions here could focus on how evaluation is handled. Are clear, high expectations stated for all, using student friendly language that guides the students to equitable outcomes?

- Focusing question for feedback
- Participants are silent; no questions are entertained at this time.

3. Clarifying Questions (5 minutes)

- Participants have an opportunity to ask “clarifying” questions in order to get information that may have been omitted in the presentation that they feel would help them to understand the context for the student work. Clarifying questions are matters of “fact.” The facilitator should be sure to limit the questions to those that are “clarifying,” judging which questions more properly belong in the warm/cool feedback section.

4. Examination of Student Work Samples (15 minutes)

- Participants look closely at the work, taking notes on where it seems to be in tune with the stated goals, and where there might be a problem. Participants focus particularly on the presenter’s focusing question. Presenter is silent; participants do this work silently.

Protocols are most powerful and effective when used within an ongoing professional learning community and facilitated by a skilled facilitator. To learn more about professional learning communities and seminars for facilitation, please visit the School Reform Initiative website at www.schoolreforminitiative.org

5. Pause to reflect on warm and cool feedback (2-3 minutes)

- Participants take a couple of minutes to reflect on what they would like to contribute to the feedback session.
- Presenter is silent; participants do this work silently.

6. Warm and Cool Feedback (15 minutes)

- Participants share feedback with each other while the presenter is silent. The feedback generally begins with a few minutes of warm feedback, moves on to a few minutes of cool feedback (sometimes phrased in the form of reflective questions), and then moves back and forth between warm and cool feedback. Warm feedback may include comments about how the work presented seems to meet the desired goals; cool feedback may include possible “disconnects,” gaps, or problems. Often participants offer ideas or suggestions for strengthening the work presented.
- The facilitator may need to remind participants of the presenter’s focusing question, which should be posted for all to see. Presenter is silent and takes notes.

7. Reflection (5 minutes)

- Presenter speaks to those comments/questions he or she chooses while participants are silent.
- This is not a time to defend oneself, but is instead a time for the presenter to reflect aloud on those ideas or questions that seemed particularly interesting. Facilitator may intervene to focus, clarify, etc.

8. Implications for Equity

Like the Collaborative Assessment Conference, it may be valuable to discuss the implications for teaching and learning of what we’ve heard and discussed using the lens of equity. The reflection questions below would enrich the learning and help us “interrupt” inequities that may be raised by the Tuning. The point is not to shut the presenter down, or put them on the defensive but rather to challenge everyone involved to a higher level of awareness. Thus placing these at the end of the warm/cool feedback session both addresses the focus question and takes it beyond the presenter’s work.

Possible Reflection questions following the activity: (from both Nancy Mohr’s draft of LASW for Equity and additions by Debbie Bambino)

- What have each of us learned about building the habit of equity through doing this protocol?
- What are our own next steps?
- Who’s at the table? Who’s missing?
- Why aren’t those voices included?
- How can we include those whose perspectives have been silenced historically?
- How does the work we’ve just done serve all of our students?
- How does it serve those students who have been marginalized in the past?

9. Debrief (5 minutes)

- How well does the presenter feel the question has been answered?
- How well do we feel we answered the presenter’s question?
- Facilitator-led discussion of this tuning experience.

Summary and Conclusion

Education does not occur in a vacuum; it is subject to both local and societal contexts. To work toward school improvement educational leaders can implement strategies, such as PLCs, which are grounded in dialogue. PLCs are a reform strategy that bring people together in ways that they might not have been before. Teachers are in collaborative teams in dialogue creating a shared meaning of practice and understandings for improvement. Pounder (1998) noted that collaboration's purpose is "(1) to increase the democratization of schools, and (2) to enhance school effectiveness and/or productivity" (p. 174). Teachers and other educators working together for the improvement of all involved and improving student learning is a consistent point in the literature on PLCs. PLCs are used in the district under study.

PLC-based dialogue tends to focus on teaching strategies for student achievement. Dialogue in PLCs can be structured through protocols. Another well-established form of dialogue is critical dialogue, such as the kind that has been studied in Intergroup Dialogue (IGD). PLC-based dialogue and critical dialogue have important differences. The use of critical dialogue in PLC-based dialogue can potentially help educators better serve their students through their experience. Critical dialogue is more apt to promote equity literacy. In this study, I explored how the PLC members in a CSforALL RPP conceptualized and addressed equity as well as how protocols might support the development of equity literacy.

CHAPTER 3

METHODOLOGY

Introduction

In this section, I frame the overall methodology for the study. Recall that the purpose of the study is to examine how equity literacy developed through PLC meetings in a CSforALL RPP over time. To frame the ways in which their dialogue occurred, I coded PLC member dialogues through a framework that includes access, participation, and equity literacy. I used the definition of equity literacy by Gorski and Pothini (2018) “the knowledge and skills to be a threat to the existence of bias and inequity in our spheres of influence” (p. 10). A person who has developed equity literacy has the ability to recognize, respond, redress, and create and sustain equitable environments. Moreover, given that the context of this study is a preK-12 setting, if the students cannot access or participate in the developed CS/CT curriculum, then the curriculum is inequitable. I begin by providing the setting, reviewing the research questions, and explaining the research design. Next, I describe the role of the researcher, and lastly discuss my data collection and analysis.

Setting

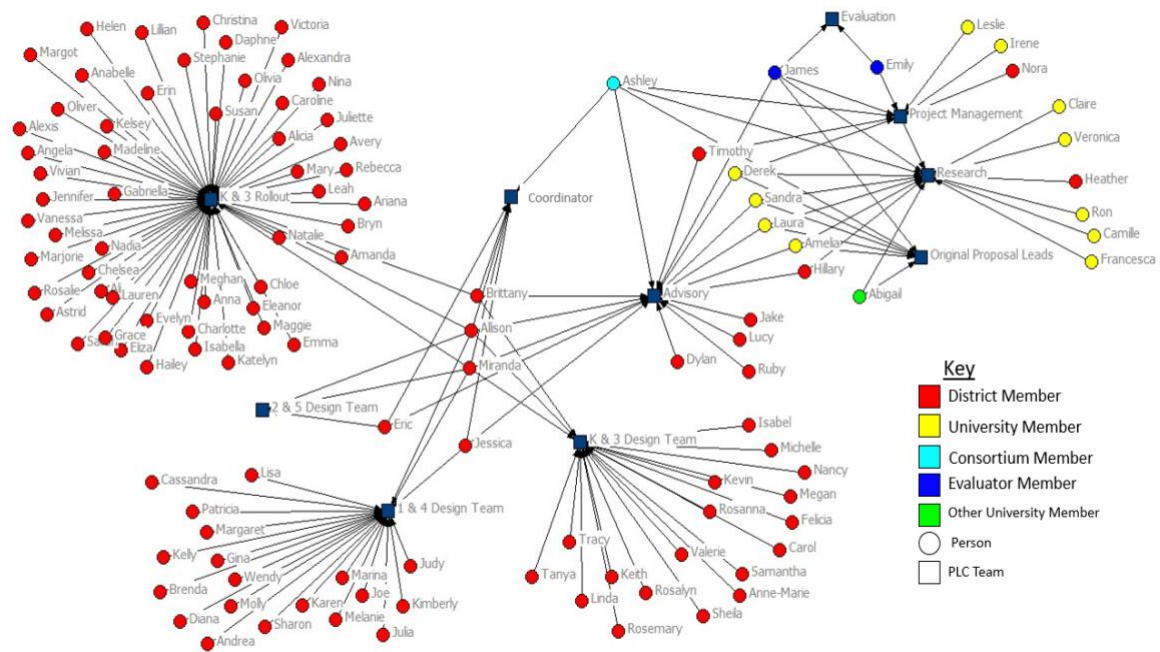
The setting for the research is the Research Practitioner Partnership (RPP) established between the University and the District, which is a local urban school district. The RPP launched during the summer of 2018 in the District’s system of elementary schools and was slated for a four-year process to support implementation of Computer Science (CS) and Computational Thinking (CT) in K-5 classrooms. The CSforALL RPP pairs the University with the District to “create curricula and a teaching and learning

environment that will prepare diverse student population... to effectively use and create technology to solve complex problems” (W. R. Adrion personal communication, November 2018) At the time of this study, there were 100+ individuals working on the CSforALL initiative in this RPP. There were also numerous Professional Learning Communities (PLCs) nested and networked within the RPP. Each team served a different function in the CSforALL initiative. To understand who is on which team and what connections existed between members and teams, I conducted a social network analysis to survey the RPP members and identify the teams and their connections. The CSforALL sociogram developed from the social network analysis functions as validation in seeking which participants to focus on (Daly et al., 2014; Moolenaar, 2013) for the research (see Figure 5). A sociogram that represents RPP CSforALL team membership as of June 2019 is depicted in Figure 5.

Teachers often serve as leaders in RPPs. The Coordinator team members, all district teachers, were responsible for the design and delivery of PD for their colleagues within their urban K-5 elementary school district, with the end goal of helping them produce innovative and scalable CS/CT lesson plans. The Advisory Team, comprised of University, District, Coordinator, and Evaluation team members, is also centrally located within Figure 5, indicating its importance in the social structural of the CSforALL RPP. The PD Team is comprised of members the Coordinator and University team members, and members from the District, when needed. All three PLCs, Coordinator Team, Advisory, and PD team are in centralized positions in the CSforALL RPP and hence have the most influence in the development of equity.

Figure 5

CSforALL RPP PLC Membership, June 2019



Research Questions

1. How do the three primary CSforALL RPP PLCs conceive of and address issues of equity over time (i.e., Advisory, Coordinator, and Professional Development teams)? How does their equity literacy grow/evolve over time?
2. How do established protocols conceive of and enable PLCs to address issues of equity?

Research Design: Multiple Cases Study

I engaged in a qualitative, multiple cases study that examines how PLCs conceive of and address issues of equity in a CSforALL RPP. I also surveyed how established protocols conceive of and address issues of equity. Qualitative studies such as this,

have the goal of eliciting understanding and meaning, researcher as primary data collector and analysis instrument, use of fieldwork, inductive orientation to analysis, richly descriptive findings) but do *not* [emphasis in original] focus on culture, build grounded theory, or intensely study a single unit or bounded system. (Imel et al., 2002, p. 5)

In using a qualitative design, I sought to understand and make meaning (Imel et al., 2002; Merriam, 1998). I compiled the data to analyze through the lens of my specific research questions, which is in keeping with a qualitative design as defined by Imel et al. All data were archival and had been generated by various members of the RPP over the course of the data collection period. I used an inductive form of analysis on the data through a framework of *how* the PLCs as a unit are conceiving of and understanding equity as well as *how* established protocols are conceiving of and addressing issues of equity. In utilizing a case study method, I was able to have thick, rich descriptions of each PLC to understand the RPP overall.

In doing a multiple case analysis, the first task was to choose the cases for review. Upon doing a social network analysis of the CSforALL RPP, as noted, I focused the investigation on how three core PLCs in the RPP conceived of and addressed issues of equity over time: the Coordinator PLC, Advisory PLC, and PD PLC. These three teams were critical to the overall function of the RPP because they were structural bridges in the social network of the RPP. If these three teams are not in the network, then it would fall apart and be disconnected, which means there would be a structural hole in the network.

After identifying the three core cases for analysis, I created a chart to organize and see each of the meetings that took place within each PLC over time (see Table 2). I used two primary selection criteria for determining which meetings for each PLC to investigate. First, I chose to delve deeply into the meetings of each PLC at three points in time: Time 1: September 2018-February 2019; Time 2: March 2019-June 2019; Time 3: July 2019-October 2019. See also Figure 6. I chose to divide the timeline as such because it coincides with shifts in the RPP process. Between Time 1 and Time 2, the Coordinators

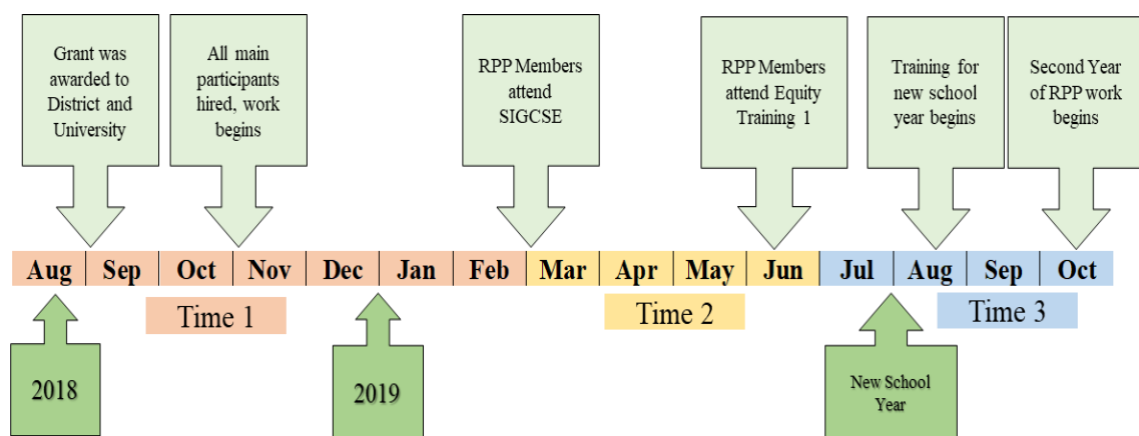
and researchers went to the Association for Computing Machinery's Special Interest Group (SIG) on Computer Science Education (CSE), or SIGCSE 2019 Conference in Minneapolis, Minnesota. Between Time 2 and Time 3, RPP members attended an Equity Training provided by a University expert in early June. These three times were significant because the RPP was bringing equity in with more purpose.

I chose two meetings in each time frame that would allow me to get a snapshot of what each PLC was discussing, planning, and how they were organizing their meetings during that time frame. The PD PLC did not exist during Time 1. Because the PD PLC did not exist in Time 1, I chose to sample more meetings from Time 3 when the PD PLC was more active. In doing so, I assure that I was able to review 6 meetings for each PLC. The RPP timeline in Figure 6 explains the months and major moments within the first year of the RPP.

The second criterion after point-in-time was richness of data sources. When reviewing which meetings to review in each time, I only selected meetings that had multiple sources of data that I could assess. I looked for an agenda, meeting minutes, and

Figure 6

RPP Timeline



a video and/or audio recording. Having multiple sources of data for each meeting increased the confidence about which I could understand what each PLC was doing in conceiving of and addressing equity over time. I found out if the agenda aligned with the notes and if they spoke about what was documented in the notes. For example, in one agenda, the topic was “Equity” and then there was a time in the agenda to talk about it; had I just looked at the agenda, I would not be able to explore more deeply into what the participants were doing at that time of the agenda. Ultimately, I was able to code 18 different meetings of the three PLCs. Specifically, I reviewed 14 agendas, 17 meeting minutes, and 17 meeting audios from the 18 different meetings of the three PLCs.

Research Question 1

How do the 3 primary CSforALL RPP PLCs conceive of and address issues of equity over time (i.e., Advisory, Coordinator, and Professional Development teams)? Does, and if so how, their equity literacy grow/evolve over time?

I looked at the Coordinators, the Advisory, and the PD PLCs. Case studies specifically look at bounded sets of qualitative data, the “social unit” (Merriam, 1998, p. 27). In keeping with a definition of a qualitative study, I looked at these three social units instead of one so that I could have multiple perspective on the events. The sampling of these social units/PLCs was chosen purposively through the use of social network analysis (Figure 5). In this study, I looked at three PLCs as units of analysis to gather a better understanding of the RPP as a whole. Merriam (1998) defined a qualitative case study as “an intensive, holistic description and analysis of a single instance, phenomenon, or social unit” (p. 27). As I am using multiple case studies, I investigated and looked in depth at each PLC through the events of their meetings. The three together aligned with a

qualitative case study analysis as it allows for an “intensely study a single unit or bounded system” (Imel et al., 2002, p. 5). Multiple data sources were sought to triangulate the data. These three PLCs were chosen for their centralized position and primary responsibility to be able to act and maintain the goals of the RPP, that is, equity. I explored how these PLCs conceive of and understand equity across three points in time, before and after two significant events in the life of the RPP between September of 2018 and October of 2019. These significant events marked moments in the RPP that influenced the conversations around equity. Each PLC meeting was an event from which I analyzed the PLCs’ conceptions of equity and how they addressed issues of equity. I analyzed at least two PLC meetings per time frame. The possibility of data sources with at least two of the following data points: agenda, meeting notes (also called minutes), audio recording, and/or video recording are shown in Table 2.

Table 2

PLC Meetings/Events Potentially to be Analyzed

PLCs	Time 1 (Pre-SIGSE)	Time 2 (Post-SIGSE)	Time 3 (Post Equity Workshop)
Advisory PLC	- 10/22/2018	- 04/24/2019	- 09/10/2019
	- 12/18/2018	- 05/14/2019	- 10/08/2019
	- 01/15/2019		
	- 02/12/2019		
	- 03/25/2019		
Coordinator PLC	- 11/05/2018	- 03/28/2019	- 06/13/2019
	- 11/16/2018	- 04/04/2019	- 10/03/2019
	- 12/06/2018	- 04/23/2019	
	- 12/20/2018	- 05/22/2019	
	- 01/02/2019		
	- 01/14/2019		
	- 01/31/2019		
Professional Development PLC (PD PLC)	- PLC did not exist yet	- 05/08/2019	- 06/19/2019
		- 05/24/2019	- 07/02/2019
			- 07/30/2019
			- 08/22/2019
			- 09/22/2019
			- 10/09/2019

I reviewed and analyzed artifacts, including notes, recordings, surveys, protocols, observation, and participant-observation field notes for PLC meetings. I used inductive reasoning as I reviewed the data to code and review it. The preliminary analytic framework was developed to understand and look for evidence of the concepts of equity, including access, participation, recognition, responses, redressing, creating, and sustaining. The data were reviewed for preliminary understanding and then reviewed again so that the data could be sorted and coded into the various themes. The analytical frame supported the exploration and understanding of each event (the meetings) so that an overarching comprehension of the RPP could unfold. The analytical framework was expected to evolve with the coding process.

The design of this study required minimal participation on the part of the PLC members, as the multiple case study data were gathered through artifacts of the first year of the CSforALL RPP. In using artifacts, it is in keeping with a researcher's goals to reduce the burden on participants. Further, all participants were notified of the possible use of their recordings, video, and audio as well as survey responses. They were also notified of their right to anonymity and confidentiality as well as non-participation without consequence. These informed consents were created in collaboration of the Principal Investor with the research team members. The study has been approved as part of the overarching approval of the CSforALL RPP through the University of Massachusetts Amherst Institutional Review Board (IRB). The overall IRB protocol was established in collaboration with and through the Principal Investigator, William R. Adrion.

Data Collection

As part of the RPP, data collection practices for archival purposes were established early on in the form of video and audio recordings, agendas, and meeting minutes gathered for each meeting and saved in accessible cloud servers, namely Dropbox and Microsoft Teams. Typical limitations of accessing data, such as location of data, are mitigated through the availability of the data through these cloud servers and my position as a graduate assistant.

Data Analysis

To understand the cases of the PLCs, I primarily used objective observation of the recordings of the selected meetings and protocols to analyze against the analytical framework created that included areas of understanding equity literacy, namely: access, participation, recognizing, responding, redressing, creating and sustaining, equity. As noted in Table 2, multiple cases were developed and analyzed across PLC and time to get an in-depth understanding to answer Research Question 1.

Data were analyzed and marked for the salient themes within the analytical framework. The themes were made the center of various concepts and were scrutinized for evidence against the themes found. Data were coded through the use of NVivo 12th ed. (QSR International, n.d.) software. Meetings to confer with my principal investigator, Dr. Rebecca Woodland, occurred to support the development of the analytical framework and think together to confer about the data analysis.

Each file was kept on a password protected computer. Files were uploaded to a secure cloud server called Box. Further literature review would involve exploration of

teaming in RPPs, cycles of inquiry and collaborative problem-solving within equity pedagogy that support the four abilities of equity literate educators.

The study was focused on the CSforALL RPP from September 2018 to October 2019. The RPP was in partnership among three entities: the University, the Evaluators, and the District. The study looked at the emergence of conceptualizing and addressing equity through the educational leadership of members in three specific PLCs within the RPP as units of analysis: The Coordinator Team, the Advisory Team, and the Professional Development Team.

Coding began with looking at my analytical framework base, the groundwork for my codes (see Table 3). In the initial coding, I looked for anything stated in the meetings' audio, transcript, agenda, or minutes relating to equity of access, participation, recognition, responding, redress, and create-and-sustain. Furthermore, as an insider in preK-12 and fellow educator, I noted areas in which participants were discussing terms, such as "differentiation" as part of equity. I did so because in preK-12, "differentiation," for instance, is also about making sure all students have access and can engage with the curriculum in the classroom.

Table 3

Analytical Framework Base (adapted from Gorski and Pothini, 2018)

Frame	Description
Access	how are the participants talking about how equity is incorporated into the work, i.e., curriculum, lesson plan, module, etc.
Participation	how are the participants talking about how engaged all the students are in the work
Recognize	how are the participants showing their “ability to recognize even the subtlest biases and inequities
Respond	how are the participants showing their ability to respond to biases and inequities in the immediate term
Redress	how are the participants showing their ability to redress biases and inequities in the long term
Create and Sustain	how are the participants showing examples of their ability to create and sustain a bias-free and equitable learning environment
Equity	how are the participants showing examples of talking about and incorporating equity

The reader may recall that these areas were identified as elemental aspects for my coding because they are elements of equity literacy by Gorski and Pothini (2018). After understanding the basis for my codes, it is important to understand who participated in the advisory professional learning community.

Research Question 2

How do established protocols conceive of and enable educators to address issues of equity? By established protocols, I mean ones that are readily available on the internet through nationally recognized organizations and foundational texts in the literature on protocols.

As a member of the CSforALL RPP PLC team of Collaboration Researchers who introduced protocols to the RPP, I wondered how other established protocols conceived of and addressed issues of equity? In order to find out if protocols conceived of and addressed issues of equity, I conducted a survey and analysis of protocols used by the three PLCs as well as protocols described in two prominent websites and foundational

books on protocols. The choice of protocols was made based on their categorization by the organization or authors as being related to equity.

I reviewed and analyzed 39 protocols from two websites that were well-known, easily accessed, and peer reviewed: The School Reform Initiative and the National School Reform Faculty organizations. These websites were popular, based in research, established, and easily accessed by educators. I also analyzed and reviewed well-established books: *Power of Protocols* (McDonald et al., 2013); *Facilitating Teacher Teams and Authentic Teacher Teams and Authentic PLCs* (Venables, 2009); and *Looking Together at Students' Work: A companion guide to assessing student learning* (Blythe et al., 2015). These books were often cited by other academics in the field, they were well-known, and foundational for understanding theory and use of protocols. More resources were incorporated if they were found to be foundational through literature saturation. Recall that literature saturation for this study meant that the texts were beginning to cite each other as their grounded work and the authors were core in each other's understandings.

I used an inductive approach to coding in order to make sense of the data. An inductive approach was appropriate because I used my analytic framework of equity, access, participation, in addition to Gorksi and Pothini's (2018) four aspects of equity literacy. Each protocol was evaluated as a case. The sampling of the protocols was also purposive. A purposive sample is appropriate because I used established protocols to discern a logical representation of the population of available protocols. In analyzing PLC meeting data, I noted the protocols used, if any. The protocols were analyzed as more of surveyed checklist to see if it utilized or prompted the users to discuss or

dialogue about equity, access, and/or participation, and/or support the development of any of the four abilities described by Gorski and Pothini (2018). In the protocols used by the PLCs, I looked to see in what way the protocols were used and if there were any adaptations for equity.

Limitations

Some important limitations exist in this multiple case study. As it was a multiple case study, I got thick description of the three units of study as well as the protocols for the second research question. Findings, however, may not be transferable outside of the context of this CSforALL RPP. The study was conducted within an urban preK-5 setting. If any of the context variables for the study were to change, for instance, the district, university, topic of the RPP's focus (instead of CS/CT), the study would need to shift as well. In this study, the District already had a multi-year relationship with the University involved. Specific members of the central office of the District had already worked with some of the University members in the RPP. At least to some extent, the study would be different because the District itself had pre-existing professional development on equity. It is unknown what impact those pre-existing relationships had on this study.

Delimitations

Though the RPP has funding to be from the 2018-2019 academic year to the end of the 2022-2023 academic year, the study was focused on the CSforALL RPP from September 2018 to October 2019. The first year of the CSforALL RPP is important to understand the ways in which the members were grappling with their initial development and conceptualization of equity. The RPP was in partnership among three entities: the University, the Evaluators, and the District. Furthermore, the study did not look at all of the PLCs within the RPP; instead, I looked at three specific PLCs within the RPP as units of analysis: The Coordinator Team, the Advisory Team, and the Professional Development Team. For research question 2, established protocols were chosen from nationally recognized organizations as well as foundational literature on protocols. The choice of protocols was made based on their categorization by the organization or authors as being related to equity.

CHAPTER 4

DATA FINDINGS AND ANALYSIS

Introduction

This chapter presents the analytic findings I obtained as I sought to answer two questions: 1) How do the 3 primary CSforALL RPP PLCs conceive of and address issues of equity over time (i.e., Advisory, Coordinator, and Professional Development teams)? Does, and if so how, their equity literacy grow/evolve over time? and 2) How do established protocols conceive of and enable educators to address issues of equity? As noted in Chapter 3, the study was conducted as a series of case studies. For RQ1, the cases are of each PLC: the Advisory, Coordinators, and Professional Development (PD), over time. For RQ2, the methodology changes slightly in that the cases are reviewed protocols as data so as to understand how established protocols equity is conceived of and addressed within.

To begin the chapter, I review the statement of purpose. Then, I restate RQ1 and began with an introduction on the data analysis process and analytical framework for the data for each case (each PLC) over time. I review the findings over time with the subsections of Time 1, Time 2, and Time 3. Next, I review my analytical framework for the coding processes of analyzing the data of RQ1. I begin with the findings over time of the Advisory PLC, then the Coordinator PLC, and lastly, the PD PLC. In conclusion of RQ1, I summarize the findings for the three PLCs as an understanding of the RPP's conception and addressing of equity over time. Afterward, I review RQ2, discuss the data analysis process, and list and explain the findings. Finally, I provide a conclusion to the chapter and preview the next.

Statement of Purpose

The primary purpose of the study was to examine how PLC educators in the CSforALL RPP conceived of and addressed equity over time. I specifically analyzed qualities of equity literacy as defined by Gorski and Pothini (2018) as well as access and participation. The RPP PLC members began using protocols at the recommendation of the University partners. Protocols are often used to structure conversations about shared purposes. I, therefore, explored how established protocols may have promoted equity literacy.

Research Question 1

How do the three primary CSforALL RPP PLCs conceive of and address issues of equity over time (i.e., Advisory, Coordinator, and Professional Development teams)?

How does their equity literacy grow/evolve over time?

RQ1 Findings: Introduction and Analytical Frame

The CSforALL RPP communications infrastructure was organized through teams called Professional Learning Communities (PLCs). While the overall RPP functioned as a larger PLC that tackles a larger problem of practice, teams within the RPP operated as their own micro-PLCs, engaging in cycles of collaborative problem-solving around more specific problems of practice that support the overarching goal of CT/CS implementation and equity. The RPP in this study worked to explore how to provide high quality CS and CT for all students in an urban preK-5 setting. As noted, the conceptualization of “forAll” implies addressing issues of equity. However, how to collaboratively problem-solve issues of equity/inequity was not explicitly facilitated by the RPP CSforALL project but left for the PLCs to define; therefore, the primary focus of this study was learn how the

PLC team members did so in their first year In this study, I use the following definition of collaborative problem-solving competency from the Program for International Student Assessment (2017):

The capacity of an individual to effectively engage in a process whereby two or more agents attempt to solve a problem by sharing the understanding and effort required to come to a solution and pooling their knowledge, skills and efforts to reach that solution. (p. 6)

The PLC members were likely to engage in dialogue to decide together what problem of practice to pursue, take collective action, and then evaluate and continue to work together. Rather than tackling a problem from their individual perspectives, teachers collaborated and used their collective abilities to problem-solve together. The objective of this research question was to explore how a CSforALL RPP PLCs conceived of and addressed, that is, problem-solved issues of equity over time.

RQ1: Data Analysis Process

The first step in the analysis process was to select which cases to analyze and define my data. I chose the Coordinator, Advisory, and PD PLCs due to their crucial role in the overall social network of the RPP. I then organized the various data points for each PLC by separating the study period into three distinct time periods. The time periods were chosen based on critical time points in the development of the PLCs, such as participant attendance at the SIGCSE. The final point in defining my dataset was to choose the data points. I organized the information available from each meeting into Table 2; I looked for agendas, notes (also called meeting minutes) and records of audio and/or video recordings. I chose a minimum of two meetings for each PLC, with more data points chosen for the PD PLC due to its development later in the timeline.

Once my dataset was clearly defined, I began my data analysis. Data analysis was completed in multiple phases. Because the main issue that I am concerned with is the concept of equity, the first phase of data analysis involved a simple sweep for the key word “equity.” My second sweep involved expanding the coding to include occurrences of the terms related to “*access, participation, recognize, respond, redress, create and sustain* [emphasis added]” (Gorksi & Pothini, 2018, p. 12), which describe the six areas of equity literacy as defined in Chapter 3. Finally, I went through all selected sections of data and looked for co-occurring themes in the context of each of these terms.

I was then able to focus more deeply on a second review of coding of the already sifted data as to what the team was more specifically exploring related to the themes of access, participation, recognition, responding, redressing, and creating and sustaining. The basic level of analysis was a mechanism for being able to chunk the data in more manageable ways so that I could fine tune and differentiate between the more nuanced terms of *access, participate, recognize, respond, redress, create and sustain*. Therefore, once I identified meetings in which equity was a topic in some form, I was able to assess the meeting for these themes.

Table 4*Data Organization*

Team	Time	Date	Data
Advisory	Time 1	01/15/2019	Audio, transcript, agenda, minutes
		03/25/2019	Audio, transcript, agenda, minutes
	Time 2	04/24/2019	Audio, transcript, agenda, minutes
		05/14/2019	Agenda, minutes
	Time 3	09/10/2019	Audio, transcript, agenda, minutes
		10/08/2019	Audio, transcript, agenda, minutes
Coordinator	Time 1	12/06/2018	Audio, transcript, agenda, minutes
		01/14/2019	Audio, transcript, agenda, minutes
	Time 2	03/28/2019	Audio, transcript, agenda, minutes
		05/22/2019	Audio, transcript, agenda
	Time 3	06/13/2019	Audio, transcript, agenda, minutes
		10/03/2019	Audio, transcript, agenda, minutes
Professional Development	Time 1	DID NOT EXIST	
	Time 2	05/08/2019	Agenda, minutes
		05/24/2019	Audio, transcript, agenda, minutes
	Time 3	07/02/2019	Audio, transcript, agenda, minutes
		07/30/2019	Minutes
		08/22/2019	Agenda, minutes
		10/09/2019	Audio, transcript, agenda, minutes

All six meetings for each PLC were initially coded for whether the teachers used or referred to the term equity or something synonymous to see how the participants were thinking of equitable practices or grappling with defining and understanding equity. Furthermore, as an insider in preK-12 and fellow educator, I noted areas where participants were discussing terms, such as “differentiation” as part of equity. I did so because in preK-12 “differentiation” was also about making sure all students have access and could engage with the curriculum in the classroom. Originally, the language of differentiation stemmed from gifted and talented educational background but has come to mean the ways in which educators are modifying or adapting their teaching practices in order to be more inclusive of all learners.

From this subset of coded data, a second process of coding occurred for *access, participation, recognize, respond, redress, create and sustain*. From these codes, I found that most of the time all three teams spoke about equity with an external locus of control. They expressed difficulty with thinking about how the members could define equity and operationalize it. The finding is unsurprising given the common practice of PD implementation in most schools. Often, school leaders provide PD by bringing in an expert to tell teachers about best practices and what to do. Teachers are then supposed to return and engage that new knowledge in their classrooms and in their schools. What this practice does is effectively erase teacher's own expertise, knowledge of their own contexts, and awareness of existing gaps. Teachers are inherently trained to maintain an external locus of control for expertise rather than recognize their own expertise and act on it. However, there is expertise among the teachers and educators within schools, and they are aware of their contexts and gaps. Shifting power to center teachers' expertise and creating conditions for teachers' exploration and own understanding of equity would be a way to eliminate the external locus and generate and foster their ownership and understandings of what equity is and could look like in their district, schools, and classrooms.

Advisory Professional Learning Community—Findings

In this section, I present the results of the first case study, the Advisory PLC. The case study analysis was created in an effort to understand how the Advisory PLC conceived of and addressed equity in their first year of engaged work within the CSforALL RPP. For the purposes of this study, recall that I am defining equity as “equity literacy” whereby its members understand and see within themselves and others’ biases

and inequities. By being able to recognize bias, the idea is that they will be able to address it in both the short- and long-term as well as support how to create and sustain that kind of environment for themselves and others. Theoretically, a sense of equity literacy will translate into the development of four abilities:

1. Recognize even the subtlest biases and inequities
2. Respond to biases and inequities in the immediate terms
3. Redress biases and inequities in the long term
4. Create and sustain a bias-free and equitable learning environment (Gorski & Pothini, 2018, p. 12).

The Advisory was a group consisting of members from all the PLCs except for the teacher implementers. Primarily, it had representatives of each of the three research teams, District administrators and academic team chairs, both members of the external evaluation team as well as the Coordinators. The Advisory usually met once a month, though they may meet more than once in a month if there is a need expressed within the members of the RPP. Meetings occurred primarily virtually on an online platform, such as Zoom. Meeting online allowed for more group participation since the meetings were usually during or just after the workday and saved participants the travel time of getting to a designated meeting location. In-person meetings occurred when possible with the option of folks being able to join online if they could not be at the meeting in person. The group came together to share information from each respective team, voice questions and opinions on upcoming decisions and events for the RPP and clarify project and Advisory specific goals and create shared understandings around project goals. The Advisory was also responsible for creating task forces (temporary or long-term) to meet the needs of the

RPP. For example, in the Spring of the first year, task forces were created around recruitment, equity, and PD.

Analysis for the Advisory PLC included coding all six meetings over the course of the three distinct time periods (See Figure 6). I have organized the main findings along the following timeframes: Time 1: September 2018-February 2019 or “All about the Launch,” Time 2: March 2019-June 2019 or “Making Spaces for Equity,” and Time 3: July 2019-October 2019, “Developing a Plan.” I have divided the results based on time periods reviewed and provide a summary of the findings as a whole. Overall, there is evidence that the group grew in its understanding of equity and in planning on how to address it within a professional context.

Advisory PLC Time 1: All About the Project Launch

During the first time period, folks spoke primarily of access and specifically on how the modules were going to launch, how the teachers were going to do the work of developing the modules, and how the RPP could support the teachers’ work and understandings. For instance, in the January 15, 2019 meeting, there was a conversation of teachers’ having access to materials for their students to use during a module lesson. One participant, Miranda,³ stated, “There's only X amount of things we can buy, gum drops are probably not one of them” (Advisory, Transcript, 01/15/19). Her comment was indirectly linked to access because it related to the logistics of enacting the modules in the schools. Having or not having materials, in this example, gumdrops, would impact how students would be able to access the CS/CT lesson. Another conversation was primarily around how to get feedback to the teacher teams (the dyads). The complication

³ All PLC members’ names have been converted to pseudonyms. As some members only exist under one title, titles are withheld as well to protect anonymity.

was regarding making time and meeting space for the meetings. “One of the big pieces of feedback that we received is that people feel a little bit rushed, um, and they didn't feel like they had enough time to talk or really like listen and get that feedback” (Allison). The RPP launched in August 2018; however, it was not until September/October 2018 that the RPP had recruited teachers and began the work of the RPP. Therefore, what was meant to be set up in early summer of 2018 and launched in September 2018, was on a three-month delay; the 12-month timeline was reduced to 9 months; (Review Figure 6). The approval of funds, and then recruitment, and organizing teams took a few months—so many participants felt a time crunch. Time 1 was when the RPP was getting underway, developed ideas for the scope of the RPP, developing plans for how the work was to be accomplished, and identifying responsible parties. Therefore, it was not surprising that comments about how teachers told the Coordinators that there was not enough time to discuss the feedback the Coordinators were trying to give them. Comments about feeling rushed or not having enough time to do the work or discuss the work abounded across the meetings of the Advisory PLC during this time period and few conversations related to educational leadership about equity.

Advisory PLC Time 2: Making Spaces for Equity

In Time 2, the Advisory PLC began discussing the need for a task force around what needed to be done for teachers' PD and figuring out how to decide what to do about operationalizing equity for the RPP as a whole. I noted through my analysis that such discussions were held with an external locus. The Advisory members wanted to know how they could bring in training and resources about how to operationalize equity and created a shared definition:

Could we have more part of the PD group first and then to the RPP equity training? I'm thinking about urgency. What's happening first? ... It makes sense if it was embedded. So, we'd like to give an intro when it's during the August PD about the equity and then maybe piecemeal it in but that's different than what this [equity training] is supposed to be. This is supposed to be for us, so we all get on the same page about what we're talking about, we're throwing that word around that same kind of equity. (Amelia)

In response, “but it may be that we should certainly be related to how we’re framing it [equity in the PD]” (Allison). The concept of equity was unclear; there was no consensus on what “equity” meant, but there was the beginning of conversations to make space for equity and get more information in order to get consensus for the group. The Advisory PLC spent time discussing sequencing of training, who should go, who should give the training, and pacing/timing of the equity training. The Advisory Team agreed that equity needed to be incorporated into the PD and more information was needed overall around equity. On April 24th, six task teams were created, one of which was the RPP Equity Training team and the PD Task team. Members of the Equity Training team were volunteers and originally consisted of three University members and the RPP Project Manager. The Equity Training team was tasked with finding an expert to present and teach the CSforALL RPP members on equity. In May, the Advisory scheduled the first two-hour workshop on equity, and it was voluntary. An estimated 40 members attended, which is just under half of the members. Later, during the May one-hour meeting, 10 minutes were allocated for an update to discuss and report out what the Equity Training team had done. They also reported out their next steps, mainly who else they planned to contact. The limited time is an indicator that there was recognition for the need to be able to talk about equity but competing time frames perhaps did not allow for a more thorough conversation. Within the 10 minutes, the Equity Team was able to inform the Advisory

PLC, not necessarily get the Advisory PLC's thoughts through discussion or dialogue. If the Equity Team could have thought, discussed, or dialogued with the Advisory team members, then it would have been more indicative of an opportunity to redress or create and sustain concerns around equity, instead, the time for report out was evidence of recognition. Nonetheless, the reader can see that Time 2 reflected growth from Time 1 in that PLC members asked specific questions about equity, plans were made for next steps around equity, and Advisory members created space to reflect and continue planning.

Advisory PLC Time 3: Developing a Plan

In September 2018, Advisory did not have anything regarding equity in the agenda. The agenda listed several desired outcomes, one of which was "Shared understanding of major learnings from year 1 (from reports)". During this meeting, the Coordinator team was given 15 minutes to update the Advisory on what the team did over the summer and what that work might imply for the upcoming second year of the RPP. The Evaluation team (two RPP members who were from an external company to evaluate the RPP's progress) was scheduled to have half an hour on their year 1 "highlights of learning" from their year one report and what the implications would be for the upcoming second year of the RPP. While not explicitly on the agenda, evaluator James talked about equity in his written end-of-year-one report presentation, in regard to the compression of the timeline since the RPP began work in earnest in October 2018 instead of August 2019 as intended. He noted:

One of the implications of that timeframe issue beyond sort of logistics was also just these questions of making sure that we're sort of being deliberate about how we're incorporating equity and inclusion as part of the work. In a situation like that, it can become a lot harder to do that well when you're also just trying to get things done in a short period of time....so that was kind of a lesson that we learned

out of that was making sure to try and keep that front and center as we're doing things. (James)

Laura spoke up about the concerns regarding time and purpose in the RPP: "We've identified the issue [time limit and equity] but we haven't completed the research" (Laura); later it was also established that the RPP as a whole needed "to develop a working proposition of how to define and operationalize equity" (Stephanie). Although not directly on the agenda, the issue of equity was still being discussed as something to address by members; however, when and how the proposition was going to be created was not decided upon.

At the October 8th meeting, there was no evidence of equity listed in the agenda. In the notes, Advisory PLC members observed that they had a goal to "do something in recruitment to encourage diversity," though what they would do was not explained. They were using the term "diversity" as a way to talk about how more representation of folks from the global majority was needed in the RPP, specifically in the teachers. The use of term "diversity" was proof of recognition and an attempt of create and sustain. The Advisory also articulated "operationalizing equity in the project" as a potential goal for the year. The team discussed what longer-term issues could be and the implications. The discussion mainly had to do with "How do we educate the whole child in a bundle with some things that are integrated and some that are isolated?" (Advisory). The question was put to a vote and the Advisory decided that a goal for the Advisory PLC would be to "develop a working definition of equity in this project and how we are operationalizing it, then monitor this and address emerging issues and needs" (Advisory). Here, I found evidence of a concrete plan was defined by the team in which there was evidence of ownership. The ownership suggests an increase in equity literacy and movement away

from an external locus of control; the members of the Advisory PLC were bringing in a more internal locus of control over how they were defining equity and enacting it in their role within the RPP.

Advisory PLC Summary of Findings

I noticed that, most of the time, across all three time periods, the Advisory team spoke about equity with a sense of an external locus of control. It was a concept to be brought into the RPP; the Advisory PLC had trouble thinking about how the members could own and operationalize equity.

During Time 1, the Advisory PLC did not speak of equity or related concepts. However, by the end of the year, the Advisory PLC was able to integrate equity through the form of providing spaces to create shared understandings of equity through case studies, identity wheel protocols, and using protocols to help unearth layers into understanding, recognizing, and responding. There was also talk about having an external facilitator come and support a conversation for the RPP members, those who were going to be part of the four-year process of the RPP to develop a shared understanding and definition of equity.

The Advisory team developed three task forces in May 2019: the Recruitment Taskforce, the Equity Taskforce, and the Professional Development Taskforce. In June 2019, the equity taskforce brought in a University expert to provide an introductory presentation on equity, identities, and to raise awareness for members of the RPP. The event was voluntary for members of the RPP and about 40 people attended. The meeting was received positively, and the Equity taskforce, Coordinator, and Advisory PLCs asked for equity to be incorporated more into the PD for the upcoming school year of teachers.

Overall, it was evident that the Advisory PLC members remained in conversation about trying to decide how to define and operationalize equity within the CSforALL RPP. Access was part of the conversation on how to operationalize equity, questions, such as “How do we help teachers understand equity?” and “How do we incorporate equity into the professional development?” were brought up. The conversation of the Advisory PLC members was more about recognizing equity within the role and purview of the CSforALL RPP and what they could do about equity. Ultimately, when thinking about how to *respond* and *redress*, the Advisory PLC was mostly looking for external support for how to define and operationalize equity for the CSforALL RPP overall. They hired a University expert and were able to establish that more support was needed by the development of the task force. While indirect, these first steps are what would set up for creating and sustaining and redressing the issues of equity within the CSforALL RPP.

Coordinator Professional Learning Community—Findings

The Coordinator PLC was a group consisting of specifically chosen teachers and teacher leaders from the District. These five teachers were recruited to serve as instructional leaders within the RPP. These teachers and instructional specialists collectively are the Coordinator PLC. Often at the Coordinator PLC meetings was the Project Coordinator and a few of the researchers from the RPP. The Coordinator PLC was responsible for the design and delivery of PD for their K-5 urban elementary school colleagues, and through which the K-5 teachers were expected to produce innovative and scalable CS lesson plan modules.

The health and vitality of collaboration within the Coordinator PLCs and between the Coordinator PLC and the rest of the teams in the RPP was of particular import. As noted, the Coordinator PLC was a communication hub, connecting actors across the CSforALL network. The Coordinator PLC was responsible for developing and directing a collaborative learning process for classroom teachers through which those teachers

Figure 7

Coordinator Professional Learning Community Mission Statement

Coordinator Team - Who We Are and What We Do Adopted May 2019

The Coordinator Team meets regularly in person to engage in dialogue about structures for teacher learning, evidence about the quality of teacher created lessons/modules, including written artifacts and observations of teaching, and about the quality of their collaborative processes.

The team collaborates in order to:

- Ensure the creation and implementation of high-quality, equitable CT/CS lessons/modules
- Establish a structure through which teachers access on-going support, guidance, and feedback from one another and the Coordinators about the development and implementation of high-quality, equitable CS/CT lesson modules
- Positively influence students' perspectives and understandings of CS/CT, and
- Contribute to the development of a coherent Research-Practitioner Partnership.

design, pilot, and teach standards-based, innovative, and equitable computer science lessons to create modules.

The Coordinator PLC met twice a month, typically Thursdays, for approximately an hour and a half. The Coordinator PLC Chair, Allison, often facilitated the meeting, and reviewed the agendas. They often met at Allison's school or via an online platform, such as Zoom. Like the Advisory Team, meeting online allowed for more group participation at times since the meetings were usually during or just after the workday. Meeting online saved participants the travel time of getting to a designated meeting location. In-person meetings often occurred when possible with the option of folks being

able to join online if they cannot be at the meeting in person. The Coordinator PLC came up with their own mission statement shown in Figure 7.

Coordinator PLC Time 1: But First, Logistics

In Time 1, the Coordinator PLC was trying to establish itself, its members, roles, and responsibilities. Overall, however, coordinators did not have equity as part of their conversations or processes. There was no time given on the agenda or a part of the dialogue to conceive of or address equity. Most of the meetings were around logistical matters of what to inform the teachers, direct the teachers, or frame the work for the teachers as they developed their modules. For instance, in the agenda for December, time was designated to reflect on meetings with the dyads, discuss how the Coordinators would identify what dyad meetings to attend and set up a schedule as well as set up goals for deliverables for the month (Coordinator, Agenda, 12/06/19).

In their December meeting, the term equity was not on the agenda. Not having equity on the agenda provides some evidence that the Coordinators were not formally considering, conceiving of, or addressing equity. Coordinators discussed concern for consent for recording teachers, as well as making sure that the teachers could choose if other RPP members can join their meetings (Coordinator Meeting Notes, 2018). Both of these issues are about logistics and concerns to protect and support the teachers but not necessarily the students. The Coordinators did however somewhat talk about equity when they asked what the role of the English Language Learner (ELLs) teachers' support would be for the project. In having the conversation about the ELLs teachers' support the Coordinators were showing consideration of access and how to create and sustain a more equitable curriculum; they were recognizing and asking for support for how to provide

curriculum for students whose primarily language may not be English. The RPP was intending to have an ELL Coordinator hired, but at the December meeting, it was uncertain when an ELL Coordinator would be hired or who it was if that person were hired.

In early January 2019, the Coordinators discussed equity in terms of access around getting parental consent forms translated and distributed in Spanish. There is some evidence around equity in terms of access because the Coordinators are showing proof that they were considering and recognizing that the District's families speak more languages than English. The Coordinators did not discuss other languages; however, the primary language besides English spoke in the homes of the students is Spanish. They also talked about which classrooms would be good to start the CS module piloting as the teachers had various levels of teaching experience "but one of the classes is particularly challenging, which may not make this a good class in which to observe the pilot" (Coordinator). The Coordinator minutes quote was equity adjacent because they were considering the students' needs for access and participation in the CS modules. If the classes are already understood to be challenging for the teachers and the dynamics of the students themselves, then introducing a new concept, like CS in the classroom, might be more disruptive than supportive. Similarly, in the January meeting, equity was discussed in thinking about who was observing the modules being piloted and how the folks visiting/observing the class might impact the students' focus. Time 1 was primarily then about the logistics of who and how the CS modules would be developed and piloted. Equity was discussed as access and somewhat in regard to participation. There was little

observable formal time given to the discussion of equity during Time 1 within the Coordinator PLC.

Coordinator PLC Time 2: Beginning to Respond

Time 2 consisted of meetings between mid-February and June 2019. In March, the Coordinators dedicated half an hour on their agenda to talk about “accessibility for all students” that explored the question, “How can we develop a shared understanding of equity and how does this relate to the work for the remainder of the year?” (Coordinator). The question arose from the Coordinators’ discussion in the January meeting about how the teachers of the RPP would reflect on their work. The question and time in the discussion is evidence that Coordinators recognized that equity, overall, was something that needed time formally on their agenda but also that the specific questions helped to further clarify what they want to do to respond. They spent the time talking about student identities and asking questions, such as “What are we teaching in the modules and how are we teaching it?” (Coordinator). When considered together, the discussion of identities and curriculum shows that the Coordinators have recognized that bias and inequity exist, that they need to respond to it, and that they have power to “advocate against inequitable school practices” (Gorski & Pothini, 2018, p. 12). Further, the discussion continued to try to understand how to potentially implement a framework of culturally responsive, relevant, and sustaining curriculum and how the Coordinators could present that information to the teachers. The discussion was evidence of actively “naming biases, inequities, or otherwise troublesome conditions that are immediately apparent to you” (p. 14). In doing so, the Coordinators were redressing, or setting right the unfair situation of their students by using their position to look at varying perspectives to sustain different

ways of teaching that were more equitable. The conversation did not include an official definition of what culturally responsive, relevant, and sustaining curriculum was, only that other than resources would be shared. Conversation notes showed that the team started thinking about the identities of the teachers in the District, who mostly identify as White, and the students in the District who identify mostly as people of color. Protocols and processes for how the Coordinators wanted to support the teachers were discussed. The “Focus, Fiddle, Friends” (Frank et al., 2011) description of how innovations are diffused was discussed. Based on Frank et al. 2011, the Coordinators would be in the “fiddle” phase, where “they develop locally specific knowledge of the innovation [CS curriculum that would be culturally responsive, relevant, and sustaining] to their organizational context” (p. 141). In addition to conversation about curriculum and identity, the theme of feedback also arose during Time 2. The Coordinator chair expressed concern with how to provide feedback to the teachers regarding their lessons and require changes, “How do we make them change things like that without seeming like we're attacking” (Allison). The Coordinators were moving in their spheres of influence, from themselves to their next sphere of influence. The next sphere of influence for the Coordinators was to tap into the collective knowledge of the RPP to work with and support the teachers who were building and piloting the CS modules. Coordinators’ conversations around equity related to what equity is, how the team was going to introduce equity to the teachers, and what resources the RPP had that could be shared. Although the questions were brought up, no decisions were made which indicates that they recognized equity but were not sure what to do. The team decided to follow up on resources with logistics around an upcoming showcase and talking about the feedback

cycle of the modules and lesson plans. The team's conversations relates more to collaboration of what the process would be and not necessarily equity. It would suggest that they were dealing with the aspect of recognizing inequities and the beginnings of redressing. They were not dealing with how to create and sustain long-term change in the curriculum or guidance they were providing for teachers.

Coordinator PLC Time 3: Beginning to Redress

In June, the Coordinator PLC met a week after the Equity training by a University expert. They focused 10 out of 90 minutes on the agenda for debriefing the training. Although they recognized that time/space needs to be allocated to discuss equity, they did not allow enough time. They were able to use the Head-Heart-Hands (Singleton, 2015) protocol; this protocol asks participants to reflect on what about an activity made them think (head), made them feel or resonated emotionally (heart), and cause them to want to do something or take action on (hands). In using the Head-Heart-Hands protocol, the Coordinators structured the 10 allocated minutes so that everyone had a chance to speak and listen to others, which is an equitable practice. The Coordinators were also really focused not only on what they feel called to do (hands) but what they are thinking about and what they felt. An anomaly in the June meeting was the presence of researcher Laura who normally did not attend Coordinator Meetings. The June 2019 meeting notes indicated that in sum, those present at the meeting took the following away from the training:

Being mindful and making assumptions about people; trying not to make assumptions and get to know people for who they are; Being aware as opposed to not being aware and paying attention to diversity; The journey is never over; there is always something to learn about equity; We need to get to know each other more in order to begin having these conversations; where do we all come from? (minutes, Coordinator, 06/13/2019)

There was talk of how to include identity and students' positionality in the classroom for the upcoming agenda on PD. The talk exemplified here was evidence of recognition and thinking about how to redress inequities in the Coordinators' work. There was a specific conversation that Laura brought up on how the bee-bots (one of the CS tools teachers were using) were being gendered by their pronouns. Teachers using "he/him" as the bee-bots' pronouns. Laura's comment fostered an increased awareness of gender around how objects, like the bee-bots, could not have a gender. Specifically, it was announced that the bee-bots do not have a gender, and discussion was encouraged to think through how teachers can broach the topic of the bee-bots' pronouns. The conversation around the bee-bots' pronouns was brought up by Laura, so the topic was not by design on the part of the Coordinators but serendipitous and would not have occurred had Laura not been in attendance. The October meeting was principally a report-out of what was going on at the time; the technology and materials were distributed to the schools. This could relate to access because that meant that the students would have access to the materials. Other than access to the materials, there was no other evidence of equity discussed.

Coordinator PLC Summary of Findings

The Coordinator PLC did not conceive of or address equity much during Time 1. However, during Time 2, they began to ask questions and reflect on what equity might mean in their work and how they might operationalize it in their work with the teachers. Finally, in Time 3, the Coordinators reflected on their experience of the training together, though for only approximately 10 minutes of the 90-minute meeting.

Professional Development PLC—Findings

As previously mentioned, the PD PLC was not formed until June 2019. The PD PLC team was originally established as a task force by the Advisory PLC. The PD PLC held their first meeting in June 2019. It was comprised of researchers and the coordinator team. They met primarily to organize, develop, prepare, and deliver PD to the teachers in the RPP. They did not create or prepare PD for the RPP members, such as the Advisory PLC members, Coordinator PLC members, or any of the researchers of the administration of the District. The PD PLC worked specifically to organize the PD for the teachers. They met almost weekly in times of leading up to a PD event. They meet less frequently when PD is not coming up or does not need to be planned. The PD PLC was the only taskforce that gained enough cohesion to be able to engage in a cycle of inquiry. The other taskforces disbanded before or after their tasks were completed.

Professional Development PLC Time 1

The PD PLC did not exist in Time 1 of this study.

Professional Development PLC Time 2: Launching with Recognition

In May, the team met just after the Equity training to begin to discuss the upcoming August PD meetings. The May meeting was also one of the first meetings of the PD PLC. Their agenda indicated “Equity??” as their topic which indicated that they wanted it on the agenda but were not sure what the time dedicated to it would entail. During their conversation, I found that the PD team listed a series of questions regarding “culturally relevant work” and conversations about “differentiated instruction” and funding as well as the “pragmatic” or logistics of how to do equity or operationalize it in some way. They were recognizing and starting to launch the PD team and the teachers’

training with equity in mind. More than anything, they asked a lot of questions around what they wanted to do for the first day of the August PD sessions. For the plan of the second and third days of the August PD sessions, equity was listed as being “equity weaved throughout the day” with reflection in the afternoon to think about the identities of their students as the teachers begin to write their modules. Equity was listed as “Throughout all activities weave in equity, frame equity as an ongoing process” for the August 8th and 9th PD days. I did not observe specific information or clarity around how the PD Team intended to redress or create and sustain the bias-free environment.

On May 24th, the team was working further with details around the August PD. They had an approximately 20-minute conversation about what equity would mean and shared their concerns about how to incorporate it. At the end of the conversation, it was agreed that equity would be brought in as a reflection of the first day of the PD in which there was planned discussion around equity and what “forAll” means in the CSforALL RPP introduction. The PD PLC wanted to ask teachers to remember and reflect on who their students are (thinking about identities) and how they could bring in their knowledge and reflect their students. Although it was their first time coming together as a group, there was clear evidence that the group was specifically discussing issues of equity during the second time period which was consistent with the purpose of the PD PLC as created by the Advisory.

Professional Development PLC Time 3: Focusing on the Possible

As the PD PLC did not exist in Time 1, I chose to select 4 meetings for time period 3 to still have 6 samples of each PLC. On July 2nd, there was a conversation around the “Draw-a -computer-scientist activity” and a computer scientist identity wheel.

A primary objective for the activity was not set yet but was listed as something the team wanted. For July 30th, there was a prior discussion about who was bringing what for the PD; the elaboration was that Laura was going to introduce and facilitate the “draw-a - computer-scientist activity,” and I was going to introduce and facilitate the identity wheel. When the team met again to start planning the fall PD, the “desired outcomes” section on the agenda stated, “a plan for implementation focusing on equity.” They expressly noted that they wanted to follow up on equity through case studies focused on equity. Laura was taking the lead with her team and two other researchers. The case studies were going to provide vignettes with follow-up questions about the dilemmas presented in the vignettes. These case studies were meant to be a point of discussion for the teachers. For the September 7th meeting, the PD PLC’s objective was, “to comprehend quarter one modules in order to implement curriculum in a culturally responsible way” (PD PLC, Minutes, 09/07/19). It was not clear as to what “culturally responsible way” meant. The conversation around what the PD PLC wanted to achieve led to two goals: 1) to help students develop an identity that students can be someone who can do computer science and 2) to have teachers to develop an identity to believe they can be someone who can teach computer science. The PD PLC wanted to think about what their unconscious biases were and ask themselves “what are my limiting beliefs around the kids?” (PD PLC, Minutes, 08/22/19). This quote was evidence that with equity, the team was recognizing, responding in the immediate term, and redressing them by having discussions about it. They were working expressly to think critically about their biases. The teachers were also given journals during the three days in August

of PD. The teachers were meant to be able to reflect in their journals as well as share with each other if they wanted to during the upcoming PDs.

During the 10/09/19 meeting, equity was on the agenda. The equity section of the agenda was set aside for Laura to facilitate. The timing and pacing of the equity section within the overall PD session were discussed and set. No more than 45 minutes were made available in the PD session to talk about the equity case studies, and none of the members except Laura and me knew what was in the case studies and what the questions would be for the teachers. Other members were given the option to read through the case studies. The content of the case studies was not discussed. Instead, the team discussed how long it would take to do the case study activity thoroughly. The team talked about considerations such as teacher members arriving late and providing enough time to process the activity so that there could be a transition into the other activities the team was planning for the PD. It was decided that the PD team would reach out to the Equity Taskforce for more information and thoughts about how to incorporate equity. Again, as noted in the previous coding, the PD PLC exhibited outsourcing the information to be brought in. I brought up that I was no longer a member of the Equity Team. I did, however, encourage my fellow PD PLC members that we talk with the Equity Team on some of the things we were talking about in the PD. The PD team said that next steps would be to “report out on the Equity team’s recommendation” (PD PLC, Minutes, 10/09/19). By the end of the third time period, the PD PLC had set up systems to incorporate some initial conversations around equity and, specifically, identity. These systems and conversations appeared to support increasing teachers’ equity literacy. They

raised awareness and provided a space for *creating and sustaining* conversations to further *recognize* and *redress* issues that could arise as the exploration continues.

Professional Development PLC—Summary

Compared to the Advisory and Coordinator PLCs, the PD PLC had the most consistent conversations around equity over time. They were also most tasked by the RPP hierarchy (Advisory) to directly operationalize how the teachers were going to have contact and work with equity. Specifically, the PD PLC had the most control over the teachers creating and implementing the modules.

In Time 2, the PD PLC was grappling with how to introduce the teachers to equity as well as how the RPP was understanding and operationalizing equity within the RPP itself. During Time 3, evidence showed that they were providing more time in their planning of the PD for teachers to discuss and explore what equity meant. Furthermore, in working with the teachers on their case studies and providing facilitation for the conversations, the PD PLC was allowing for space recognizing and problematizing the work with the teachers.

RQ1 Conclusion

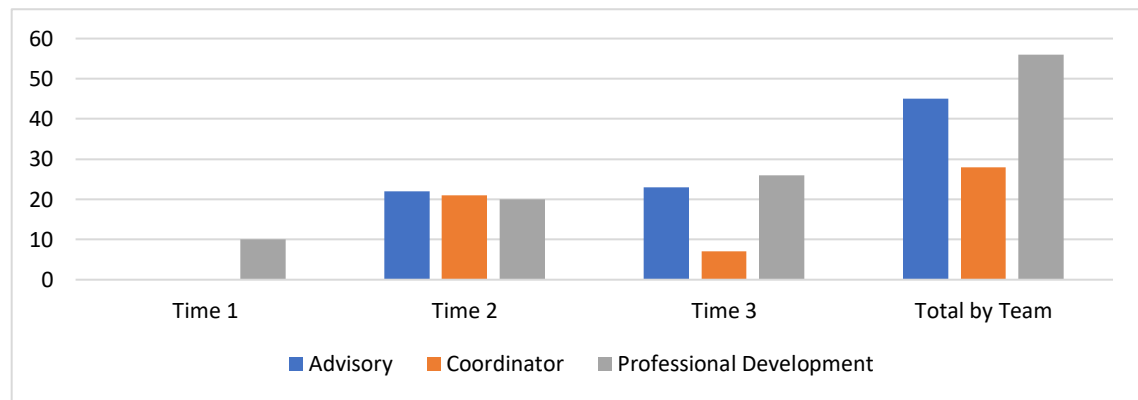
Sampling the three cases of the Advisory, Coordinator, and PD PLCs provided an overview of the RPP's first year in trying to grapple with conceiving of and addressing equity. The Advisory, Coordinator, and PD PLCs initially demonstrated interest and enthusiasm for addressing and incorporating equity into their PLCs. However, they also demonstrated uncertainty and lack of knowledge about available resources and protocols to structure their goals. They conceived of equity as something complex that needs to be operationalized and something about which they lacked knowledge and confidence. They

primarily thought of identities, such as race and gender, which are related to equity. They felt the need to raise awareness for themselves and those involved in the RPP. There was evidence of *recognition* and *redressing* because the PLC members were using their roles in the RPP to share with others their *recognition*. They discussed equity as differentiation, too. The PLC members deferred to outside research or experts, such as University experts and articles, after their time at SIGCSE to try to find out “how to do equity,” which gave an external locus of control. I observed that they did not feel knowledgeable enough to teach, facilitate, or assess for equity in the work for the CSforALL RPP. However, they did speak about readings in the shared space of the Advisory PLC at the beginning of Time 2. Advisory later delegated tasks by building several taskforces, one of which was built to expressly address equity in the RPP. The Equity taskforce was responsible for acting and doing research on how to bring in resources for the overall RPP members.

I looked for the term equity and its synonyms, like *differentiation*, in their agendas; this is illustrated in Figure 8. Primarily during Time 1, the three PLCs did not

Figure 8

Query of Equity and Synonyms



speak of equity. The Coordinator Team had a reduction in equity and its synonyms between Time 2 and Time 3. I surmise that is because the members of the Coordinator PLC were heavily involved in the PD Team, and the topic was discussed more to the PD PLC. There was then *perhaps* more time to discuss equity because all the PLCs were able to brainstorm and discuss their conceptions of equity as well as how they were going to address or operationalize it within the CSforALL RPP. In Time 2, the RPP started creating meaning and understanding through asking questions, shared readings, and the attempt to operationalize equity in the PDs for the teachers. They also began to discuss how to disseminate knowledge with other members of the RPP. By Time 3, they created an equity task force and delegated specific tasks to members who would then report back to the group as well as developing and scheduling time within PD for new and old RPP members to incorporate development of equity awareness. However, at the end of the year, the teams were able to integrate equity through the form of providing spaces to create shared understandings of equity through case studies, identity wheel protocols, and using protocols to help unearth layers into understanding, recognizing, and responding. There was also talk about having an external facilitator come and support a conversation for the RPP members, specifically those that are going to be part of the four-year process of the RPP to develop a shared understanding and definition of equity.

At the end of year 1, the RPP was looking at how to incorporate equity into their work in a systematic way. The PD PLC was getting closer to creating and sustaining a more equitable environment. The 3 PLCs showed evidenced of more clearly conceiving of equity and a growing equity literacy through their dialogue and in developing and implementing the professional development for the teachers involved in the RPP. The

teachers in turn were working with the 3 PLCs in this study by providing feedback and they developed lessons and modules and piloted them.

Research Question 2

In order to find out how established protocols conceived of and enabled educators to address issues of equity, I conducted a survey and analysis of protocols used by the three PLCs as well as protocols described in two prominent websites and foundational books on protocols. By established protocols, I mean ones that are readily available on the internet through nationally recognized organization and foundational texts in the literature on protocols.

RQ2 Findings: Introduction

Recall from Chapter 2 that protocols are sets “of guidelines for having a focused, structured conversation about some aspect of teaching and learning” (Venables, 2009, p. 15). I discuss my results from two websites and three books. These two websites are well-known, easily accessed, and peer reviewed: the School Reform Initiative (SRI) and the National School Reform Faculty (NSRF) organizations. I chose these two organizations’ websites as they are popular, based in research, established, and easily accessed by the public. I also analyzed and reviewed protocols from well-established books: *Power of Protocols* (McDonald et al., 2013); *Facilitating Teacher Teams and Authentic Teacher Teams and Authentic PLCs* (Venables, 2009); and *Looking Together at Students’ Work: A companion guide to assessing student learning* (Blythe et al., 2015). These books are often cited, well-known, and foundational for understanding theory and use of protocols.

RQ2: Data Analysis

Similar to RQ1, I began with a broad sweep of the search term “equity” with the protocols on both the SRI and NSRF websites. The “tag” of equity narrowed down the scope of what protocols to review. I applied the same mechanism to the books by looking through each book’s table of contents as well as index and appendix if the book had one. After the review, there were 32 protocols that expressly were marked as being related to equity. After reviewing these protocols, I read through the protocols and books looking to see if any protocols could relate to equity with the terms of equity literacy around “*recognize, respond, redress, create and sustain* [emphasis added]” (Gorski & Pothini, 2018, p. 12). I found more protocols; however, they were either repeats or slight adaptations of the original 32. These protocols were eliminated from the possible data because though the protocols often stated that adaptations were encouraged, they often did not specify *how* the protocol could be used in directly with equity. Since facilitation of the protocol is critical, I searched to see if the protocols provided any facilitation tips. Lastly, I revisited the 18 meetings reviewed in RQ1 for any use of protocols to assess if the protocols used were related to equity or adapted to do so.

RQ2: Analytical Framework

My analytical framework was at first a check list to see if the protocol text met the criteria even in the remotest way to align with equity expressly. I also looked to see if the protocol text met Gorski (2018) defining four abilities around equity literacy:

1. The ability to *Recognize* subtle and not-so-subtle biases and inequities in classroom dynamics, school cultures and policies, and the broader society, and how these biases and inequities affect students and their families;
2. The ability to *Respond To* biases and inequities in the immediate term, as they crop up in classrooms and schools;

3. The ability to *Redress* biases and inequities in the longer term, so that they do not continue to crop up in classrooms and schools; and
4. The ability to *Create and Sustain* a bias-free and equitable learning environment for all students (p. 20).

I further analyzed if the text discussed any facilitation tips, as facilitation of protocols is integral to their use and success. If an educator were to read the protocol with no previous experience, I wondered if the educator would have any guidance from the protocol text on what to do.

RQ2: Findings

I found 39 total protocols to review for RQ2. I found 32 from the SRI and NSRF websites and three books by Venables (2009), McDonald et al. (2013) and Blythe et al. (2015) that met the criteria for which I was searching. There were seven additional protocols used in meetings by the various RPP PLCs. Twelve of the 32 protocols found could be found in multiple locations. For instance, the El Paseo (Circle of Identities) Protocol could be found on both websites and the book by McDonald et al. (2013). See Table 4 for breakdown of analysis of each protocol.

Table 5

Analysis of Protocols

Protocol	Source*	Recognize	Respond	Redress	Create & Sustain	Facilitation Tips	Why?
Equity Perspectives: Creating Space for Making Meaning on Equity Issues	1,2	1					Equity Tag
Provocative Prompts for Equity	1,2	1					Equity Tag
Classroom Equity Writing Prompt	1,2						Equity Tag
Affinity Groups	1	1	1				Equity Tag
Village of 100 People	1,2	1					Equity Tag
Liar's Poker	1,2	1					Equity Tag
Tuning for Equity Protocol	1,2,3	1	1			1	Equity Tag

The Paseo or Circles of Identity	1,2,5	1	1				Equity Tag
Interrupting Inequities	1	1		1			Equity Tag
The Nature of Discourse(s) in Education Notes on "Changing the Discourse in Schools" a.k.a. Discourse I & II "T" Chart	1	1					Equity Tag
Profile of a Student Activity Alternative Students	1	1			1		Equity Tag
Looking at Student Work Building in the Habit of Looking at Equity	1		1	1	1	1	Equity Tag
Equity Stances Activity	1, 2	1	1	1	1	1	Equity Tag
Suggestions for Bringing Student Work for Equity Conversations	1		1				Equity Tag
Equity Protocol	1,5		1				Equity Tag
Equity Bibliography	1						Equity Tag
Barriers of Bridges: A Matter of Perspective and Attitude	2	1	1				"institutionalized practice, prejudice, and bureaucratic mandates"
Community Agreements	2	1			1		"building communities of resistance....cite from hooks
Connections	2	1			1		talks about process and bridge building
Courageous Conversations Compass	2						it is from "Courageous Conversations about Race" but it doesn't say how to use the compass
Diversity Rounds	2, 5	1					talks about diversity and identities
The Constructivist Listening Dyad	2, 5	1	1		1	1	From the National Coalition for Equity in Education and is about listening and talking in depth through discomfort
Honoring Differences	2	1					talks about how we decide who is in our friend groups
The Lens as Paradigm	2	1					talks about expanding our self-awareness
The Multiple Perspectives Protocol	2	1			1		"purposefully seeing what each voice contributes to the whole"
Peeling the Onion Developing a Problem Protocol	2	1				1	Talks about getting to deeper issues
Questions and Assumptions	2	1	1				Directly addresses exploring and responding to assumptions
Considerations for Responsive Facilitation	2	1	1		1	1	This protocol is expressly related to facilitation techniques
Zones of Comfort, Risk and Danger: Constructing you Zone Map	2	1					This reminded me of the Spheres of Influence
Cosmopolitan Protocol	5	1				1	Equity Tag
Looking at Data protocol	4, 5	1	1			1	Equity Tag
Looking at Student Work (with Equity in Mind)	5	1	1			1	Equity Tag
Head/Heart/Hands	6	1			1		Used by RPP
Keep, Stop, Start, Change	6						Used by RPP
Plus/Delta	6						Used by RPP
World Café	1,2,6						Used by RPP
I notice, I wonder	4, 5, 6	1	1				Used by RPP
Jigsaw	6						Used by RPP

Think, Pair, Share	6	1	1	Used by RPP
*1. SRI, 2. NSRF, 3. Blythe, Allen, and Powell, 4. Venables, 5. McDonald, Mohr, Dichter, and McDonald 6. Used in RPP Meetings per University researcher recommendations				

In regard to the protocols used by the PLCs, 6 of 7 protocols met the criteria for incorporating *something* to do with equity/equity literacy. For instance, the Coordinator PLC used the Head/Heart/Hands protocol in which you process an activity (in their case the Equity Training). Participants were supposed to respond to what they thought, what they felt, and what they want to act on post-event. The protocol itself was a humanizing practice because it allowed for participants to share not only in relation to the mechanized task but also their feelings. Keeping in mind the analytical framework, having both task and feeling was evidence of recognition of elements related to equity (such as withholding assumptions) that the PLCs learned from the Equity Training by a University expert they attended.

The “I notice, I wonder” protocol was one that was found in two of the books surveyed as well as used by the members of the RPP. In the “I notice, I wonder” protocol, participants are separated into small groups, then they have a set amount of time to read a text or view something, such as a video clip from a classroom. They are first to write down only what they observe and notice for a few minutes. For example, when viewing a video clip of a classroom, a “notice” might be that there were 10 students or that there appeared to be two adults in the room, or there were handouts on the desks. Each person in the group then lists what they noticed. If others noted it as well, then they can raise their hand or nod to inform the group but only one person speaks at a time. The participants go around until all “notices” are stated. They are to re-watch the clip and then write down their “wonders. “Wonders” can be things like, “I wonder why there were two adults in the room,” or “I wonder what was on the handouts—had the students seen them

previously?” The process repeats as with the “notices”; each person in the group then lists what they wondered. If others wondered the same, then they can raise their hand or nod to inform the group, but there is no discussion, and only one person speaks at a time. The participants go around until all “wonders” are stated. Lastly, the group has a chance to discuss and think out loud together around their thoughts of the video clip. The PD PLC stated they would use the “I notice, I wonder” protocol, and I observed when they had teacher participants use this protocol during PD. The teachers were able to explore the equity case studies in one instance and another time were able to use the protocol to become more familiar with the CS standards. The “I notice, I wonder” protocol is important because it supports two of the analytical frames, recognizing and redressing. The framing of the “I notice, I wonder” protocol is what can support these two equity literacy goals. When asking folks *what* to note, a presentation or framing of equity can be helpful. Participants are then primed to review the information with equity in mind. Further, when they are “wondering,” they are able to redress or think about how to remedy what they might find problematic in whatever they are reviewing.

Protocols are useful and essential to support dialogue and critical dialogue. In effective collaboration, such as what is sought after in the CSforALL RPP, having a balance of voices where there are no “hibernators or dominators” (Woodland, 2016, p. 513) in the conversation is important. Having a structure, such as what a protocol provides, supports equitable participation of the participants in the protocol. It mitigates power dynamics by setting norms or rules of engagement in what is typically an uncomfortable topic—equity. Power dynamics are present when engaging in an RPP, as the practitioner tends to defer to the researcher in conversations, viewing the researcher

as expert instead of colleague. In conversations with mixed hierarchies, such as teachers, instructional leaders, and administration (like the kind of mixed grouping that occurs in the CSforALL RPP PD), having a protocol helps to build trust and create a space in which everyone is on the equal label of “learner.”

RQ2: Conclusion

The protocols help teachers recognize and perhaps redress issues of equity. They might also help reimagine how teachers are doing things, so while that is not a direct connection to equity literacy, it is part of critical dialogue to think about ways in which things can be done different in different contexts. While there are protocols explicitly dedicated to support equity, it is often related to trying to recognize inequity or bias. Other protocols not strictly framed as equity, can be modified or framed to incorporate equity. The PD PLC used the “I notice, I wonder” protocol to help the teacher members look at and begin to get familiar with the CS standards. Altogether, protocols proved important in the engagement of dialogue. Protocols support structure that can potentially soothe anxiety when discussing difficult topics, such as equity. They also provide rules of engagement for folks who either do or do not tend to talk or dominate a dialogic space. In short, the guidelines of a protocol provide a structured dialogic space where participants can compare complex thoughts and gain clarity that is necessary.

Summary of Findings

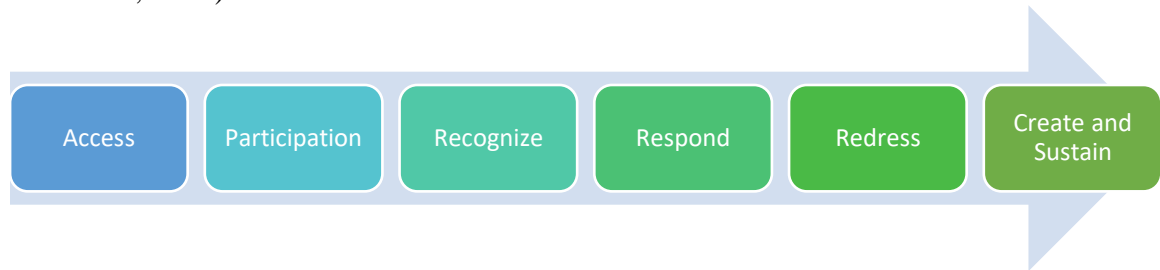
School leaders can meaningfully impact their constituents and colleagues by developing PLCs that provide a time and space for critical dialogue. The findings from RQ1 and RQ2 lend support to the current body of literature about PLCs’ collaboration and dialogue. Engaging in collaboration and critical dialogue can allow teachers to reflect

on, learn, and incorporate issues of social justice into their classrooms. Furthermore, this study suggests that by utilizing or adapting established protocols, educational leaders may be able to disrupt local systemic oppression and improve education for all. For this study, I used the framework developed by Gorski and Pothini (2018) to analyze the extent to which CSforALL RPP members developed equity literacy. I found that the CSforALL RPP members led and sought experts to implement and grow in their equity literacy. The team first developed as a unit to provide access to CS curriculum, then engaged in spreading and scaffolding the curriculum. Of the four aspects of equity literacy, I found that during the period reviewed in this study, RPP members were able to begin to recognize elements of equity and begin to engage with and understand the other areas of Gorski and Pothini's (2018) aspects of equity literacy- respond, redress, create, and sustain.

In addition to the four aspects of equity literacy, I also mined the data for evidence of access and participation. It was not until the RPP was convened that District members had the opportunity to come together (that is, have access) to think how CS could be for ALL (that is, engage in participation) in the District. In the span of one year, PLC members in this study were able to engage in cycles of collaborative problem-solving and began developing equity literacy. The study revealed that working out the logistics of access and participation were precursors to being able to have conversations about equity as shown in Figure 8.

Figure 9

Equity: Access, Participation and Four Aspects of Equity Literacy (modified from Gorski & Pothini, 2018)



RPP members spent their first year grappling with the logistics of forming, that is, how to exist, including deciding how often to meet, defining memberships, assigning tasks, and deciding on purpose (stages of development, Tuckman, 1965). It appears that the work of incorporating equity into CSforALL may not begin until these first steps are accomplished, as trust among peers is developed precisely through such a process. Ellinor and Gerard (2018) referred to the process as being a part of building the container for dialogue. Once members are ready for dialogue, they then face the constraints of time and discomfort around the topic at hand. To better manage these constraints, members should utilize or adapt established protocols. Protocols work to help structure uncomfortable conversations, to create shared meaning, and to develop an understanding of abstract concepts. The protocols I analyzed mainly supported *recognize* (see Figure 7) in which participants were able to begin to notice biases and may begin to question how some policies or curricula may include/reject some students. *Recognize* further means that the protocols can encourage participants to think about how they might reject deficit ideologies and somewhat supported the other aspects of equity literacy. Nonetheless, because protocols can effectively develop the culture and norms for the team, members can then critically dialogue and grow in equity literacy. Dialogue reifies what the group

was thinking by providing a space to negotiate difficult conversations. When dialogue reifies a group's thoughts, trust can be built among participants. However, if groups become closed off to other opinions or healthy dissent, then the dialogue that concretizes can become a negative attribute.

Conclusion

In this chapter, I reported my findings for RQ1 and RQ2. For RQ1, the data show that the RPP began the year with little to no evidence in conceptualizing or addressing equity. As the RPP members engagement with the work continued, they grappled with finding guidance to define equity and share that definition with their fellow members. The RPP stayed primarily at the “recognize” level, though began to create the conditions for further developing their equity literacy. RQ2 showed that most protocols support the conversation around equity in “recognition” and beginning to “respond” and begin to imagine how to “redress” issues of equity.

CHAPTER 5

DISCUSSION

Introduction

This research study aimed to examine how PLCs in a CSforALL RPP conceive of and potentially address equity over time. I explored protocols that can be used by educators who seek to enact CS/CT for all, with an emphasis on the concept of “for all” regarding equity. This chapter reviews the implications of the research findings and considers possibilities in the fields of educational leadership and social justice. In this chapter, I summarize the findings in the study conducted, discuss critical conversations in PLCs, and I then discuss the role of educational leaders. I also provide recommendations for future research before concluding the chapter.

Discussion of Findings

A key takeaway from the results of this research is that before the work of developing equity literacy can occur, those doing the work must have access to a team that meets regularly and has equity as a purpose. The collaborative time together is the “container” (Ellinor & Gerard, 1998) for the PLC members’ critical dialogue and development of the PLC members’ equity literacy. Once members of an educational setting have the kind of access just noted, then they can start the mental work of processing difficult conversations, like equity. This study’s results indicated that once PLC members decided their purpose, clarified how equity was going to be incorporated into their work for the CSforALL RPP, and adapted team membership, then clearer conversations around conceptualizing and integrating equity began to occur. It is not surprising that the PLC teams needed to exist in a structure. Tuckman’s (1965) notion of

group organization and Woodland and Mazur's (2015b) findings on effective collaboration illuminate that a principal condition for a group or PLC to exist is a structure before a group or PLC can begin to perform. I anticipated then, that conceptualizing and addressing equity would not begin immediately for the CSforALL RPP. To capture the process, I looked at the CSforALL RPP at multiple points in time over the course of Year 1 to assess if and how they were developing an understanding of equity.

Adapting team membership within the CSforALL RPP proved integral in the PLC members' understanding of equity. Initially, the RPP depended solely on the Coordinators for delivering PD, which meant only the Coordinators were primarily responsible for the content, the materials, the structure/delivery of the PD, and the locale. These responsibilities were then shifted to a new group, the new PD PLC (originally the PD taskforce) that was created by the Advisory PLC. This new PLC appears to have advanced the development of equity literacy in the RPP. More RPP members came together to co-create a dialogue container about equity in the work of the RPP, in other words, a space for equity was created. In the new PD PLC, Coordinators continued to lead, but other RPP members, such as those from the University, stepped in to be thought partners and to provide support for PD responsibilities. The interconnectedness of the Coordinators with the University members in the PD PLC promoted and helped teachers' ability to grow in equity literacy. RPP members who were part of the PLCs as well as teacher members were able to work together to recognize, respond, and think together about redressing, creating, and sustaining. By incorporating equity into their planning and

enacting those plans, the three PLCs studied showed evidence of responding, creating, and sustaining conversations around the concept of equity in the RPP.

What I found was that the CSforALL RPP members showed growth in their search for understanding equity. PLC members began to conceive of equity as different from equality. PLC members decided that providing a variety of CS curricula would be the best way to start accomplishing their goal of making the curricula *for all*. At first, the element of equity came in the form of deciding what types of CS curricula would be provided for the different grade levels of students. The PLC members decided that for all students, it would be best to provide a variety of CS curricula. The PLC members decided to differentiate some of the types of CS curricula for learners. Some of the beginner CS lessons included unplugged activities that required no device and bee-bot robots that could be coded to do simple movements, like forward and back. Some of the more complicated CS lessons included block coding in Scratch and other code-able devices, such as Makey Makeys and Hummingbirds, for more complex CS/CT engagement. PLC members continually worked to recognize how they could define equity and take steps to address issues of equity. For instance, PLC members asked teacher members about identity, stereotypes, and what representation of examples existed in the curricula being developed. Specifically, PLC members noted that many teachers were using the same book character as an example of a girl who could code. While that character shared the same gender identity as some of the students, she was also phenotypically white and did not appear to have any (dis)abilities. The PLC members decided to converse with the teacher members about book characters and think together about what other ways student identities could be incorporated into the CS curricula being developed. These actions

listed were evidence of how the RPP members began to respond by integrating equity into their PD planning and following through on those plans during PD.

Critical Conversations in PLCs

This study found that CSforALL RPP's PLC members developed equity as a core part of their work's purpose. The RPP PLC members' shared problem of practice was how to create and enact CSforALL in the District through the structure of collaboration in and between PLCs. The CSforALL RPP members began their process with a plan to embed CS curricula District-wide. The underlying assumption, however, was that since the CS curricula were being embedded in this District, it was by default equitable. The CS curricula being embedded in this District assumed access and participation of diverse students since the population of the District included students of the global majority, girls, and students with (dis)abilities. The CSforALL RPP members did not have an express *design* for how to incorporate equity in their work. However, the CSforALL RPP members *did* have PLCs as a foundational teaming structure. The CSforALL RPP PLC members began to complicate the assumption of what "for all" meant for their work of embedding CS curricula District-wide. CSforALL RPP PLC members grew in their equity literacy and increased critical dialogue for the entire CSforALL RPP membership, thus, demonstrating that difficult conversations, such as those about equity, can be held among preK-12 educators. The PLC members' collaboration was the nexus of change in the CSforALL RPP. This study found that certain elements of the PLC members' collaboration supported the conditions for holding critical conversations about equity.

This study found that effective PLC collaborative structures are one way to provide the container for critical (e.g., difficult) conversations, such as equity. The PLC

members' collaboration had qualities of effective collaboration (Woodland & Mazur, 2015a, 2015b). The PLCs adjusted membership to find the appropriate people to tackle the purpose of equity, set aside time to dialogue, developed a process for dialogue, and were able to make decisions and act on those decisions; importantly, PLC members returned to dialogue and evaluated their action-taking together and across PLC teams. The nucleus of collaboration is dialogue. Both PLC-based dialogue and critical dialogue operate within a system and structure. The PLC structure allowed trust to be built among the PLC members, which in turn, allowed for difficult conversations.

The data showed that protocols can advance critical conversations, even within limited timeframes. Protocols provide an organized way in which to target conversation around a certain goal or purpose in a meeting. I found that the CSforALL RPP PLC members did not use any protocols initially but used some later in Year 1. As part of the structure for dialogue, protocols are often recommended for PLC members' use, such as the established protocols developed and available through the National School Reform Faculty, like the Save the Last Word for Me Protocol (Averette, n.d.). These protocols provide specific feedback around a certain topic and support time constraints for the people involved.

Protocols supported the dialogue of PLC members' collaboration, which is essential. I did also find that established protocols allowed PLC members to recognize that issues of equity exist in their local contexts. Some protocols supported other elements of equity literacy, such as to respond, redress, create, and sustain. The protocols are also connected to the type of critical dialogue discussed in the literature review for this study. PLCs are predicated on dialogue; this study shows that it is possible to engage

in critical dialogue and increase equity literacy among PLC members. CSforALL RPP members intentionally adapted protocols to better frame questions and include more language to help them reflect explicitly on issues of equity about racism. An example from this study is the Coordinators' use of the Head-Heart-Hands protocol (Singleton, 2015) to discuss emotions and to debrief their experiences of attending PD on equity; while more time would have been useful, the core of being able to express and have a guide for the conversation was successful. Finally, the data revealed that the established protocols evaluated in this research (Table 4) mainly support only one aspect of equity literacy: recognize. In other words, the protocols expressly invited PLC members to think about different points of view and to consider different identities. These protocols minimally support the areas of redressing, responding, creating, and sustaining in the development of equity literacy, for example, the ability for educators to combat inequities. PLC collaboration and critical dialogue can have PLC members work toward the process and goal of social justice, for example equity. Bell (2016) defined social justice as:

Both a process and a goal. The goal of social justice is full and equal participation of all groups in a society that is mutually shaped to meet their needs. Social justice includes a vision of society in which the distribution of resources is equitable, and all members are physically and psychologically secure (p. 1-2).

As part of the process and goal of social justice, PLC-based dialogue with a critical lens should work to center voices that are often marginalized, honor existing knowledge, and help inform exploration as the members of the PLC work to build the vision of a more equitable society. The United States school system is increasingly diverse, with projections that by 2055, "the U.S. will not have a single racial or ethnic majority" (Cohn & Caumont, 2016). PLC members and educators, when provided the opportunity, benefit

from critical conversations on identities, intersection/interaction of identities, and power in the relationships with their colleagues and students.

Educators will be more effective with a broader understanding of critical reflection and dialogue. Guerrero et al. (2017) provided an example in which researchers worked to incorporate a queer pedagogy and culturally responsive pedagogy into mandated PLCs in Toronto schools. The researchers worked to provide structured and sustained support for teachers as colleagues and co-facilitators in the establishment of the culturally relevant pedagogies that incorporated queer pedagogy. For instance, researchers facilitated two activities that explicitly pursued a shift in the understandings the teachers had about social identities, such as race, gender, and other markers of culture and self. The researchers used a “Coming Out Stars” activity, a type of protocol, which challenged the concept of gender binary by having teachers participate in an experiential journey of what it is like to “come out.” Participants took part in a “Stepping Out” activity, also a type of protocol, that assigned secret identities and then had teachers step forward each time their secret identity might answer yes to a prompt, such as “you have never felt discriminated against” (p. 8). Teachers in the Guerrero et al. study expanded their understandings of culture, the gender binary, and identity. The work of Guerrero et al. further demonstrates that PLC members can have and benefit from conversations on difficult topics with facilitation, like incorporating queer pedagogy into a culturally responsive and equitable focus on the work teachers do.

There are inequitable and unjust instructional and curricular practices that are not adequately addressing assumptions and biases happening in preK-12 settings. However, instead of having these practices change by *default*, or hoping that change will occur,

change in practice needs to be done with purposeful intention, by *design*. Unjust instructional and curricular practices need to be upended in a targeted way, such as by shifting foundations of how teachers interact with each other or question curriculum practices that are not inclusive or that lead to counterproductive approaches.

Implications for Educational Leadership

By prioritizing PLC work on issues, such as equity, educational leaders become champions of equity literacy. Stassen et al. (2013) found that having a champion in a local context supported the longitudinal incorporation of IGD in a given institution. Therefore, by becoming champions of equity literacy, educational leaders are uniquely positioned to keep equity at the forefront of their communities over time. In this section, I provide recommendations for educational leaders' practice related to collaboration, dialogue, and equity.

Educational leaders create the conditions of collaboration among PLC members and often set the purposes for the PLCs. PLCs are an established lever for change in schools; educational leaders can harness PLCs and encourage PLC members to explore, develop understanding, and establish definitions of equity. Educational leadership should ensure access to PLCs by forming teams, creating time, and establishing places for teachers to discuss issues of equity. The Coordinators in this study had access to resources, time to process, and time to produce outcomes in partnerships with other educational leaders who were immersed in current theory at the University. Educational leaders in this study, the PLC members, worked to build a container that allowed themselves and other RPP members to risk discussing difficult topics. In so doing, they furthered their equity literacy. Developing equity literacy, in turn, serves to improve the

curricula developed and will likely improve the classroom setting for both teachers and students across the District.

One large-scale change that educational leaders can do would be to ensure that teachers have time for job-embedded PLC collaboration and dialogue. Teachers often have expertise brought *into* their schools, which can impact teachers' sense of where expertise may lie externally instead of internally. Having an external source of expertise can impact teachers' sense of efficacy (Cook, 2012). If teachers are going to engage in critical dialogue to disrupt unjust educational practices, then enlisting and supporting teachers in having an internal locus of expertise through PLCs and the use of protocols may help. Educational leaders should seek out PD opportunities related to critical dialogue facilitation and social justice content. These opportunities would allow teachers to grow in their understanding of topics, like equity. When choosing PD opportunities, educational leaders would be remiss if they overlooked areas of expertise already present among teachers on their staff.

A small-scale change that educational leader can initiate and sustain would be to encourage the use of protocols in collaborative spaces. Educational leaders could use protocols addressing issues of equity, providing facilitation tips for adaptation, and/or create new protocols. For instance, leaders can include facilitation tips regarding specific equitable norms for dialogue. They can also name the discomfort that may occur on a topic that is often avoided, such as intersections of identities and oppressions. Facilitation tips, such as how to generate equitable norms, can be found in the literature of creating and maintaining a "container" for critical dialogue (Ellinor & Gerard, 1998). If such

practices would become standard in education, then equity literacy could be advanced system-wide.

Another possibility would be that, instead of centering equity, it may help educational leaders or researchers in an educational initiative or other RPP to focus on humanizing practices. Centering equity can be an overarching theme, but working on humanizing practices could also be a theme. Humanizing practices work to shift power dynamics in dialogue spaces to make them more equitable. Frameworks to understand if or how the changes are occurring could include literature, such as Love's (2018) raising liberatory consciousness, Harro's (2018) cycle of liberation, and Young's (1990) five faces of oppression. Each of these frameworks provides an understanding of the ways in which power is enacted in social spaces and educational leaders could translate the information into preK-12 spaces for change.

This study found that protocols and conditions for PLC collaboration are essential in the growth of the CSforALL RPP PLC members' conceptualization and addressing of equity. In conclusion, educational leadership plays a vital role in PLC collaboration and the structure of PLC dialogue. Educational leadership must champion critical dialogue in PLC dialogue in order for there to be development of understandings on difficult topics, such as equity.

Recommendations for Research

Future studies may explore an expansion of this dissertation by comparing multiple RPPs across districts. RPPs exist in various school settings, and researchers could compare/contrast how one RPP is operating in comparison to another, particularly if the two RPPs have a similar goal. For example, in the District in this study, the primary

topic was CSforALL. Researchers could look for CSforALL RPPs in other districts to glean what elements of the RPP overlap or differ in order to understand how RPPs can be successful. If there is another CSforALL RPP in another district, researchers could learn more broadly about how RPPs can/cannot succeed.

The RPP in this study was intended to grow over the course of four years. This study only assessed one year of data from a four-year intervention. Research can include additional data from the RPP across the multiple years of study so that the findings in this study could be compared over an even longer period. Doing so may be able to answer questions, such as: In what ways did the PLC members keep or change their understandings of equity? Did the PLC members further grow in equity literacy? Were protocols used more in other years and are they continuing to be used? Knowing the answers to the questions just listed would benefit the generalizability of findings from this study for educational leaders and researchers.

Future researchers could intervene as partners at every stage of PLC collaboration in an RPP or during another educational initiative to explicitly engage in more equitable processes for the PLC members. Researchers could be the ones facilitating these tough conversations at every stage so that equity gets built in partnership, though the facilitation would rely heavily on the facilitation skills and expertise of the researchers. This could look like developing shared norms with equity in mind and/or purposefully centering voices of those who are often marginalized, for instance.

It is known that protocols are effective in supporting dialogic processes. While educational leaders can prioritize the use/creation/adaptation of protocols in their collaborative educational environments, researchers can look expressly at how other

protocols shift educators' understanding of equity or advance their equity literacy. There are various types of protocols, but ones that focus on reflective dialogue, such as the Text-Based seminar explored by Nehring et al. (2010), could be included. By doing so, the research would expand the field's understanding of how established protocols can incorporate aspects of equity literacy not shown to be addressed in the protocols I evaluated.

Researchers could conduct a pre/post interview or survey with students in the District to triangulate their data points and integrate more points of view. Interviews or surveys could focus on asking students about their experiences regarding equity before and after the RPP's intervention, ask if their experience in the educational setting changed and, if so, in what ways. Results from interviewing/surveying students could enrich researchers' understanding of whether the intended outcomes of the CSforALL RPP modules developed and implemented impacted students—doing so could center their voices and share power. Other information could be obtained through surveys and interviews of PLC members and teacher members of the RPP. Having pre/post data would help triangulate information, develop a better understanding of students' and teachers' conception of equity, and allow for increased self-reflection.

Researchers could investigate how leadership roles are assigned and created among participants of an RPP or other educational initiative. Questions, such as: What does an educational leadership champion for equity look like? Is an educational leader selected or directed? How do they sustain the work they do? would be interesting to explore because it would add to the literature on characteristics of an educational leader champion. Researchers could also look into how an educational leader “champion”

operates in the RPP or educational initiative. It would also be of interest to explore preK-12 settings with educational leaders not involved in RPPs. Doing so could illuminate other conditions in which equity literacy can be conceptualized and addressed.

Conclusion

The major takeaway from this study is that preK-12 educators can have critical conversations on topics, such as equity, if given the right support. Further, PLC members should be able to prioritize social justice issues within their dialogue to further the process and goal of social justice in preK-12 educational settings. Ultimately, educational leaders in the CSforALL RPP created conditions for teachers in the District to work with the University and evaluation partners. The work in the first year enabled PLC members to begin providing access to each other via a structured time and place for dialogue and participating in the CS/CT curricula development for the students of the District. The PLC members also were able to develop their equity literacy through their conversation. The PLC members had important opportunities to learn more about equity provided to them—a conference, facilitation of their critical dialogue together, and professional training. PLC members also worked together to create shared meaning among themselves and for the other teacher members of the RPP. Educational leaders can honor the knowledge that teachers have and provide the time together and structure for the critical dialogue to occur that can successfully allow for conversation about equity.

APPENDIX

ANALYTICAL FRAMEWORK

Frame	Present: give example	Somewhat Present: give example	Absent: give example
Access: how are the participants talking about how equity is incorporated into the work, i.e., curriculum, lesson plan, module, etc.			
Participation: how are the participants talking about how engaged all the students are in the work ⁴			
Recognize: how are the participants showing their “ability to recognize even the subtlest biases and inequities			
Respond: how are the participants showing their ability to respond to biases and inequities in the immediate term			
Redress: how are the participants showing their ability to redress biases and inequities in the long term			
Create and Sustain: how are the participants showing examples of their ability to create and sustain a bias-free and equitable learning environment			
Equity: how are the participants showing examples of talking about and incorporating equity			

⁴ Refer to Gorski & Pothini, 2018, Table 2.1, p. 12 for examples

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