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Early Childhood Mathematics Through a Social Justice Lens: An Autoethnography

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Early Childhood Mathematics Through a Social Justice Lens: An Autoethnography

by

Jennifer Ward

A dissertation submitted in partial fulfillment
of the requirements for the degree of
Doctor of Philosophy
in Curriculum and Instruction with an emphasis in
Early Childhood Education
Department of Teaching and Learning
College of Education
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DEDICATION

To my parents; you truly were my first teachers and showed me a passion for learning. I cannot thank you enough for your love and support throughout my entire education. You always met even the smallest success of mine with an enthusiastic encouragement and pride.

For my husband; you have calmed me through my moments of stress where there was no possible way I could get everything done, and celebrated every little accomplishment alongside me. Your unwavering support during this process has been amazing. Thank you pushing me to see my dream through, believing in me and being my partner in life. You have made this journey possible.

My daughters; smart and determined Chloe Justine, who arrived as I began my doctoral studies and talks social justice issues with me as she seeks to change the world, and watchful Rylee Noelle who arrived to close the journey and will surely make her mark someday. I hope mommy has made you proud.

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ABSTRACT

The purpose of this autoethnography was to explore the experiences, both successes and challenges, as I worked to teach mathematics using a social justice framework in a summer enrichment camp with four and five-year-old children. Drawing from both critical approaches (Freire, 1968) and sociocultural approaches (Rogoff, 2008), this dissertation outlines critical perspectives within Early Childhood Education, as well as trends in teaching mathematics for social justice to frame the research study. Autoethnography was selected as a methodological approach in this study as I examined my own teaching experiences and journey engaging in teaching mathematics for social justice. Primary data sources include researcher reflective journal entries and videotaped lesson implementation while secondary sources include student work samples and artifacts.

From the story associated with my engagement in teaching mathematics for social justice presents insights into my experiences with this work both crafting and teaching lessons. I then offer reflections and question areas of my work related to power and control, perpetuating deficit views, relationship construction and finding a balance between math and social justice within the lessons.

CHAPTER ONE

INTRODUCTION

Within the field of Early Childhood Education (ECE), the movement to emphasize the backgrounds, experiences and contextual upbringing of children has emerged as a foci when planning and implementing instruction. As educators work to infuse these elements in ways that seek to account for children's cultural experiences and norms, it is imperative they take a critical lens to explore how this approach can be used within the school setting, and work to advocate for this type of relevance within their instruction. Engagement in critical reflection regarding classroom practice aligns with Freire's (1970/2005) notion of critical pedagogy in which educators begin to question their own practices and how they support children in beginning to evoke change in societal practices. Advancements in research outside of positivist paradigms has become essential in ECE as discourse in the field has begun to highlight that educators, and adults, cannot know what is good for all children within all contexts (Bloch, Swadener & Cannella, 2014). It is with that attention to contexts (i.e., community and home) that support the development of young children that educators have begun to acknowledge cultural upbringing and associated lived experiences children bring with them to school, and use these experiences and culture as a springboard to developing children who can work to evoke systemic changes in society.

Wanting to create agents of change within young children emerged as a desire connected to an interaction with my daughter one day on the way to school. Having a newly found interest in the television series "Paw Patrol" she was carefully examining a look and find story with the

characters from the show. “Mommy, why is Skye’s pup badge not here when all the other ones are?” I paused for a moment, unsure how to address her. It was in this silence that she spoke up. “Is it because Skye is a girl? I mean, Everest [another girl pup on the show] is not here either. Mommy, do you think the author of this book doesn't like Skye or doesn't like the girl pups?”

Our conversation continued on the route to school as I probed further into what would make her engage in this line of thinking. She shared that she didn’t think it was fair that the girl pups’ badges were missing, especially since they were important on the show as well. When I asked her how she might go finding a solution to this problem, she shared that she wanted to recreate the book’s illustration on the final page to better illustrate all the characters and their badges. She then went on to share that we should also call the author and explain to them that they forgot the badge for the girl pups since maybe they forgot them.

As I drove to work following her drop off that day I reflected on the conversation with my daughter. At four years old she saw the girl character in a text was not being represented with equal attention as the boy. My mind turned to other conversations about why the girl clothes in stores did not have the characters she liked on them, those that were ever present in the boy section. Already this child was picking up on issues related to gender stereotypes. What else might she be attending to during her careful observations of her environment and how could I prepare her to actively address them?

As an early childhood educator my interests have always rested with mathematics, but it wasn't until I began my work as a district trainer for both mathematics and Kindergarten in our local school district that I began to really look at my own mathematical practices in-depth. Reflecting on the strategies of instruction I was using in the classroom I attempted to refine my practice by using problem solving as a basis for the mathematics I was asking children to engage

in. I knew that this method of instruction would be beneficial for my learners and support their mathematics thinking and learning but still sought to improve upon my work. When my doctoral work began, I saw it an opportunity in which I could further refine my work in early childhood mathematics, but wasn't yet sure how. That shift occurred later into my doctoral study when I began to explore issues of social justice and how these conversations were happening in secondary and higher education classrooms in connection with mathematics.

One of the poignant areas of focus within current mathematics education is a commitment to access and equity. According to the National Council for Teachers of Mathematics (NCTM) Principles to Action (2014), access and equity principles call for all students to have quality curriculum, effective teaching practices, high expectations and support as needed to help them in reaching their greatest potential. Reflections of these effective teaching practices require careful and critical examination. While some practices to promote equity and access have been pre-identified by NCTM (i.e., rich mathematical tasks and open ended problem solving situations), these areas alone fall short of addressing issues of equity in connection to social justice themes. Educators' understanding of how to use these practices in conjunction with elements of culturally relevant teaching remains unclear (Ladson-Billings, 2014; Picower, 2012).

The area of critical mathematics acknowledges issues of power in society (Gutierrez, 2002). Teaching Mathematics for Social Justice (TMfSJ) has gained increasing traction as a mechanism for educators to support students in developing political awareness and motivating learners into action (Gutierrez, 2013). Aiming to use mathematics to understand the issues of society and power (Gonzalez, 2009) and understand the world and how to advocate for changes with mathematics (Gutstein, 2006), TMfSJ needs to extend beyond marginalized students (Gutstein & Peterson, 2013). It should work towards all children and teachers learning about

social justice issues related to equity, access, and race, and then ultimately prompt children and teachers to take action against these issues.

Researcher Background

Growing up, I never really thought of myself as being privileged, although reflecting back on my early educational experiences I realize there were affordances I had that my peers did not. My family was of middle class wealth, and I was an only child. We lived in a house my parents owned, which was nestled in a suburban neighborhood that was predominately White and housed many other families with children who attended school with me. Our home was located in close proximity to the elementary, middle and high schools I attended. My mother stayed at home until I was of age to attend school, at which point she took a job at my elementary school so that she could still be present for before and after school time. She was strong in literacy and made sure I had access to literature and was read to or reading every day. My father worked in the nearby urban schools, overseeing and addressing various plumbing and electrical needs. His strength was in mathematics, often showing me other ways to solve problems than what was being taught in my classroom. I was encouraged to choose what extracurricular activities I engaged in, from ballet, bowling and gymnastics in my younger years, to a later admiration for orchestra, choir, soccer and track. While family vacations were not frequent, this was largely due to my schedule and engagement in sports.

When I entered high school and was of age to get a job, my parents encouraged me not to work but rather focus on my academic studies. It was at the end of my junior year I began my first job so that I could begin to save money for a car and its associated expenses. I was admitted to a local state university and able to complete my undergraduate degree in a little over three years, taking out student loans to cover tuition and working part time to have spending money. I

was fortunate to have my parents pay for my room and board or associated rent costs when I moved off campus for my final two years. One weekend a month I drove home to do laundry, get food and visit with family.

I decided early on in life, during Kindergarten in fact, that I wanted to be a teacher. The idea of being able to teach people things and play all day long (my perception as a five-year-old) seemed amazing. Through the contacts my parents had at their respective job locations I was able to engage in volunteering and substituting as a teacher's aide in my local school district as well as the urban school district early into college. These experiences confirmed my desire to enter into the field of education. It was in my sophomore year I was required to complete observation hours in a special education setting, and I luckily landed in a residential treatment center for youth who were required to attend due to placement by the courts. Most of these children had been also classified as having disabilities related to emotional or behavioral disturbances, many having been abused physically or sexually. This placement opened my eyes to groups of students who were not getting adequate access to education. Teachers were trying their hardest, but for many of these children the content was not relevant, nor did they have the background to be successful in what they were being taught. It was then I felt the need to work in a placement where I could make a difference, where I could help to advocate for children who were at times not being heard.

My desire to focus on mathematics as a specialization began simply because I had credits from taking advanced placement courses in high school. I took as much math as I could during college, but still remember the problems I had during my first semester of freshman year. Enrolled in Calculus 2, I could not relate to my professor and was struggling. I decided to re-take Calculus 1 although I had taken it in high school already. During the course I coasted by, easily

attending to the content being lectured on in class and accurately solving in-class tasks. It was on the assessments, however, I felt tortured. I had learned different methods for solving the questions in my high school class, as well as the strategies my father had taught me from his experiences. When I used these on the class assessments, I was provided with written feedback that although my answer was correct I could not receive credit since my solution pathway was not what had been demonstrated in class. I felt crushed. My way of solving these problems was not being seen as valid by this instructor.

Upon finishing my undergraduate degree, I stayed on for my Masters, working simultaneously in a first grade classroom within the same district I attended as a child. The make-up of the classroom had changed so much from my own experiences as a child; varying shades of brown faces filled the seats I had seen as all White when younger. My children brought experiences and life events I could not relate to, so we sought to mutually understand each other. After one year I completed my Masters and relocated to Florida where I encountered shock as I navigated a new home and new culture.

I spent two years teaching third grade when I decided it wasn't for me. At this point I followed my former co-teacher who had become an assistant principal. She had an opening in Kindergarten, and I jumped on it. I was excited to work with young children again, but knew I would again need to learn about a new population of children. My children varied greatly from one another; two parent and single parent homes; stay at home parents to those who worked around the clock; speakers of English, Spanish, Arabic, Chinese, Haitian Creole and varying African dialects; those who could already read to those who were unsure of their name. I prided myself on building a community of learners amongst us, highlighting that even I was learning during our journey.

Having a focus on mathematics instruction during my undergraduate degree and a Masters in Early Childhood Education, I sought to continue this line of inquiry in my classroom practice. Reflecting on my own mathematics teaching and learning, I found myself beginning to reexamine what I knew about mathematics instruction for young children. Based on this, I became more actively involved in our district's reform initiatives for mathematics, attending professional development, serving as a model classroom for both the mathematics and kindergarten departments and becoming a lead trainer in each area. I wanted to make sure I was doing the best I could for the children in my classroom, especially in mathematics.

Once the decision for my doctoral study came, I instantly sought to merge the two areas, early childhood and mathematics instruction together. It is through this exploration I began to discern that for many of my learners I was attempting to connect with them in superficial ways. During my prior experience as a Kindergarten educator, I attended to the culture of my students mostly through a "diversity rocks" approach (Doucet & Adair, 2013), which is common amongst educators I see within our schools. With this approach, I focused on celebrating diversity by including what I felt were elements of my students' culture into problems and mathematical scenarios, such as creating word problems which connected to an upcoming celebration of holidays around the world, and including foods they might be eating or games they might play. While I felt like this approach was valid in including the backgrounds and experiences of children within my classroom setting, I now realize that this superficial attention to experiences my children may or may not be having were in fact misguided. I incorporated these holidays and events without attending to the connection (or lack thereof) they might have with children in my class. I wanted to make sure I was being seen as celebrating diversity, never mind it did not always represent my children's diversities. I can remember designing centers for my classroom

that focused on infusing elements from various holidays around the world. One example was having children in my class learn how to play dreidel and making connections to the mathematics concepts within the game- halves, all and two. While not presenting a lesson that was doing harm to my children, we never really discussed the cultural elements of playing this game, for example what each symbol represented. Furthermore, at the time there were no children in my class who were played dreidel. Elements of social justice were certainly not something I contemplated including within my classroom, unless they possessed a direct connection with standards from social studies I was addressing. Now I realize this was a narrowed view of my children's culture, resting mostly on their religious backgrounds. This view was void of a connection to the outside of school experiences that were influenced by their cultural communities. Using this approach was not enough. I have decided I want a 'do-over' with my students.

My new thoughts rest on the idea that taking a critical approach to instruction at the early childhood level, specifically in mathematics, can help to evoke needed societal change by helping young children unpack issues of both fairness and equity. Once these ideas are unpacked with young learners, they can begin to take action against them in meaningful ways. This sense of awareness and, if developed in the younger years, can manifest into practice during subsequent schooling years. This critical way of looking at my own instruction and how I can bring social justice conversations to the forefront with our youngest learners seeks to position young children as active agents of their learning such that they can be the voice of change.

I wanted to connect what my learners perceive as social justice issues and the mathematics environment more appropriately to the culture of students, a pedagogy that Gay (2010) identifies as one that aligns with culturally relevant teaching. In doing so, I hoped to

contribute to the methods by which in-service educators receive professional development around the inclusion of students' funds of knowledge (Moll, Amanti, Neff & Gonzalez, 1992).

Purpose and Research Question

Drawing from a socio-cultural perspective (Vygotsky, 1978), knowledge of the child is shaped through a combination of social, historical and cultural experiences. These experiences contribute to the way their knowledge is constructed. Beyond the home environment, community based experiences also impact the child's development (Rogoff, 2008). As educators, careful attention must be paid to the intricate woven tapestry that is the child. With emphasis on accountability and the need to ensure students' rise to changing standards, many schools have moved towards the use of more scripted resources, especially when schools are labeled as struggling to make progress or gains. In this way, disconnects exist between the mathematics content being taught, the practices being used, and the methods by which the students in the classroom learn and make sense of the world. For some learners the math presented to them within the confines of schooling does not match the mathematics they engage with on a daily basis. I attempted to bridge this divide by having word problems for my children that brought in common experiences we shared or their interests, but never thought to reach out to families or the community in an attempt to identify in what ways children were engaged with mathematics outside of school.

When I worked in the classroom I approached teaching in an attempt to attend to the background and experiences of my learners. It was these experiences that carried me into my doctoral program where I began to read academics who advocated for a more critical approach to working with young learners. These readings, as well as professional development experiences I engaged in, such as conferences, illuminated perspectives that extended beyond my approach in

the classroom. I knew deep down that young children were more than capable of having difficult conversations about topics such as diversity, race, gender, and equity, but have seen educators in practice shy away from them. I myself had failed to engage in these conversations to the best of my ability during my time in the classroom. From this, I want to ensure that others feel adequately prepared to do so.

As a result of public policies such as No Child Left Behind (NCLB), educational focus has shifted to supporting all children in developing their talents through education (Boykin & Noguera, 2011). Attention to social justice elements is critical as educators work to address issues of access and equity in education. Research on social justice in mathematics classrooms is being currently written about at both the middle and secondary levels (i.e., Brantlinger, 2013) but limited work has been written at the primary level, specifically in Kindergarten. As such, there exists a need for practitioners to not only study this work with our youngest learners, but also to explore their own experiences engaging in this work.

Ladson-Billings (2014) acknowledges the changing landscape of what has been interpreted as culturally relevant pedagogy, noting that for many researchers this understanding still reflects a narrowed view of culture in which children of the same religious, ethnic or national group are the same. Because the unique nuances are often times negated, children begin to assimilate into the dominant culture and discourse of schooling. Furthermore, Ladson-Billings (2014) states that critical practices and policy go unaddressed in the classroom such that children are left without opportunity to explore other perspectives and engage in debate. It is this action orientation that is helping to drive my research. As an educator experienced in both early childhood and mathematics pedagogy, I felt able to facilitate conversations with young children that allow them to engage in discussion around perspectives and policies that impact their young

lives, such as concepts related to fairness of rules, access to resources and materials, and power dynamics between adults and children.

As I frequently taught a math methods course for early childhood pre-service teachers as well as provide training for in-service teachers, I wanted to move from initial approaches that view diversity as purely celebratory, to those that look critically at how diverse populations are seen and treated within the world and promote agency to move towards asset based perspectives. While the educators I work with may be cognizant of societal injustices, we must begin to work against them. Additionally, deficit perceptions of young children as not capable of engaging in discourse around complex topics and a need to shelter them from such these topics remain.

I do not believe I can advocate for a practice I have not actively engaged in myself. How could I possibly be able to support teachers, both pre-service and in-service, in doing this work if I had not also done so? It is because of this belief that I feel I must actively engage in TMfSJ with young children. It is through this experience I hope to be better able to speak of my own struggles and successes, as this venture is one without a road map. Since I have knowledge of both the areas of early childhood education and mathematics instruction, I was willing to take on the challenge of navigating this course so that others have somewhat of a road map to guide them; if even slightly.

The purpose of this research was to examine my experiences as an early childhood educator who is integrating social justice elements, such as attention to fairness and equity within the school and broader community, with mathematics during a summer program for early learners. In doing so, the research question being explored was *What are the experiences of an early childhood educator working towards teaching mathematics for social justice?*

Definition of Terms

The following terms are used throughout the study to describe essential elements and ideas presented

Culturally Relevant Pedagogy (CRP): Effective practices which address students' achievement, while simultaneously allowing children to affirm and accept their cultural identity, moving beyond awareness, respect and recognition for ethnicities (Gay, 2010). CRP also works to sustain the development of critical perspectives that work to question the inequality educational systems reinforce (Ladson-Billings, 1995). CRP is ever evolving, as culture is evolving and should not be thought of as indicative of a particular nationality, ethnic or religious group (Ladson-Billings, 2014)

Culturally Sustaining Pedagogy (CSP): pedagogies which support children in sustaining both cultural and linguistic competence while also allowing them access to the dominant culture discourses (Paris, 2014).

Funds of Knowledge (FoK): skills and/or bodies of knowledge which have been accumulated through history and cultural background. These skills and/or bodies of knowledge are essential for one's well-being and operation within a cultural context (Moll, Amanti, Neff & Gonzalez, 1992).

Culturally Relevant Mathematics Teaching (CRMT): The belief that mathematics is a human activity rooted in history, politics, cultural and social norms, and that mathematics teaching should be relevant to these backgrounds (Greer, Mukhopadhyay, Powell & Nelson-Barber, 2009)

Teaching Mathematics for Social Justice (TMfSJ): Mathematics being used as a tool to understanding life, power and societal issues (Gonzalez, 2009) containing a

combination of pedagogical goals for both mathematics content and social justice elements (Gutstein, 2006).

Chapter Summary

Within this chapter I outlined my background and rationale for engaging in this research. This included reflection on my experiences as a Kindergarten educator working with diverse populations and the desire to return to the classroom to engage in using a social justice framework to teach mathematics to young children. In doing so, I explored the question of: *What are the experiences of an early childhood educator working towards teaching mathematics for social justice?* This work was completed in an effort to add to the limited research of teaching mathematics for social justice in early childhood classrooms and to tell the story of an educator beginning to engage in this work.

CHAPTER TWO

LITERATURE REVIEW

In this chapter pertinent literature related to the study will be addressed. I will begin the review attending to the theoretical framework which outlines the study, then move into critical perspectives within ECE focusing on reconceptualizing ECE, culturally relevant pedagogies (including funds of knowledge), and social justice. Following the literature related to early childhood, literature related to mathematics instruction will be presented including attention to early childhood mathematics teaching and teaching mathematics for social justice. Finally, attention to the missing perspectives within the research literature is presented to frame the rationale for the study.

In this chapter I begin by providing an overview on critical perspectives in ECE including emphasis on the movement of reconceptualizing ECE so that the emphasis is on what is contextually appropriate rather than developmentally appropriate. This section includes a focus on Culturally Relevant Pedagogy (CRP) and terms which are often related to enactment of such a pedagogy in education. Lastly, the topic of addressing social justice issues with young children is discussed. Shifting to the literature on mathematics education, I provide an overview of impactful pedagogy for teaching mathematics to young children, as well as a review of the necessity of culturally relevant mathematics teaching. Finally, in merging the two ideas of social justice in ECE and mathematics teaching, I consider the historical trends of TMfSJ including what already exists in the literature as well as attending to the perspectives which are lacking.

The chapters will conclude with how this study builds upon pre-existing work, while adding a new perspective to TMfSJ for young children.

The graphic presented below (Figure 1) outlines the theoretical framework used to design this research study.

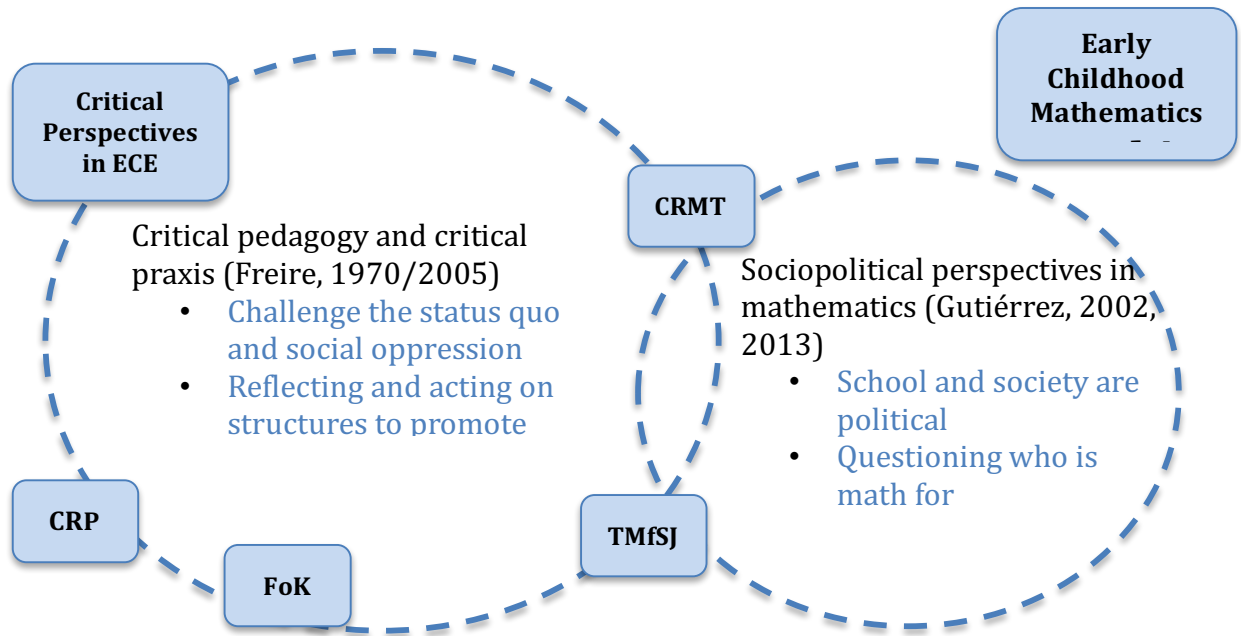


Figure 1. Theoretical Framework

The two large circles serve to represent the underlying theoretical perspectives informing this study. The first idea of critical pedagogy and critical praxis (Freire, 1970/2005) stands as the prevalent theory, with the idea of sociocultural perspectives in mathematics (Gutiérrez, 2002, 2013) connecting to critical work. From these two main areas, related sub-topics are explored. One is critical perspectives in early childhood, including notions of reconceptualizing early childhood such as attending to social justice topics in the early years; the other is culturally relevant pedagogy (CRP) including funds of knowledge (FoK) and sociocultural perspectives.

Next, research in mathematics teaching will be examined featuring emphasis on early childhood mathematics teaching. Linking the critical theoretical framework to sociopolitical perspectives, research centered around culturally relevant mathematics teaching and TMfSJ are explored. TMfSJ research will be presented highlighting connections to sociopolitical perspectives in mathematics, trends within this field as well as missing perspectives linking back to critical perspectives in early childhood education. It should be noted that many connections exist between social justice in early childhood education and teaching mathematics for social justice. Additionally, practices in CRP and CRMT are commonly linked through attention to FoK and sociocultural perspectives.

Critical Perspectives in Early Childhood

Bloch, Swadener and Cannella (2014) assert that, as educators, we cannot possibly know what is good for all children in all contexts. Each interaction a child has is something new and it is their interactions that shape their experiences and backgrounds, aligning with a sociocultural approach to the education of young children outlined by Rogoff (2003). This reconceptualization of early childhood education (ECE) seeks to move beyond only attending to DAP when working with children to more emphasis on Woodhead's (1998) notion of contextually appropriate practice (CAP).

When engaging in work related to (ECE), educators begin by learning what DAP is and how to enact this developmental theory (Ryan & Grieshaber, 2005). While the working definition of DAP does contain attention to cultural appropriateness, because the theoretical foundation of DAP lies largely within Piaget's notion of development as it pertains to cognition, many educators justify not having conversations around topics of social justice by stating that children are not developmentally ready to comprehend such concepts (Doucet & Adair, 2013).

Boutte (2008) dispels this idea, noting that young children are privy to both explicit and implicit messages related to social justice topics including race, oppression, hate and discrimination and reminding us that what an educator says is just as important as what they do not. Woodhead (2006) further confirms reiterating that DAP is largely reflective of Western culture, void of allowances with gender, diversity and individual differences, but also notes that often times, when attempting to acknowledge CAP, prior knowledge and notions of DAP or related stage based development take over.

Often overgeneralized, the early development of children is dependent on the time and place in which children exist (Woodhead, 2006). Conceptions of children vary across time including that of innocent, pure, evil, out of control, miniature adults, commodities, victims and that of the agentic child; one who is able to develop and verse a sense of agency over their lives (Sorin, 2005). These views of children, are also largely based on the community context in which the children exist. Given the current variance in students' societal and cultural contexts, having a single focus on what is aligned with DAP seems difficult (Ryan & Grieshaber, 2005) as children are not the same, but rather unique beings with varying life histories.

It is the responsibility of educators to capture and capitalize on students' outside of school experiences. Engaging in this line of work supports the movement to combat underlying ideas and discourses that promote ethnocentrism within society. Mechanisms for engaging in this discussion with young children include being open and honest with them regarding society, offering opportunities to broaden their choices within the classroom beyond what may be seen as stereotypical, helping to foster a sense of pride with young children, and moreover leading by example for other person (Boutte, 2008). With this in mind, working to engage in TMfSJ lessons with Kindergarten students marks an emerging frontier or work in which children are seen as

capable in engaging in discussions around these difficult issues and topics. By presenting children with this information in a transparent dialogue they can begin to advocate for their own beliefs, thereby developing a sense of agency. Furthermore, involving the children within the construction of lessons adds their voice in way that they may advocate for what they believe is important.

Culturally Relevant Pedagogy (CRP) and Funds of Knowledge (FoK)

Historically, deficit perspectives of students have become common in both school culture and media outlets as the interactions between people contain assumptions, stereotypes and misunderstandings lingering from prior experiences with populations other than those similar to themselves (Delpit, 1995; Paris, 2012). For some, clouded perspectives regarding capabilities, motivation and integrity have crept into the discourse of schooling, leaving populations of students marginalized and failing to see themselves and their experiences within classroom learning tasks. In other cases, approaches have been taken to remove language and cultural elements other than those that reflect accepted White values (Paris, 2012). Beginning in the 1970's and 1980's, attention was first placed on acknowledging language and literacy practices with attention on the unique nuances of these practices within varying cultures. In the mid 1990's, a shift took place which resulted in educational experiences connected with resource pedagogies, such as Funds of Knowledge (FoK) in which the discourse of students in a deficit perspective began to change (Paris, 2012).

It was from this shift that the initial articulation of culturally relevant pedagogies came to fruition through the work of Ladson-Billings (1995), defined as

a pedagogical practice to not only address student achievement, but also help students to accept and affirm their cultural identity while

developing critical perspectives that challenge inequities that schools perpetuate (*p. 469*)

Culturally relevant pedagogy was later critiqued by both Ladson-Billings (2014) and Paris (2012) as sometimes being interpreted by practitioners as a diversity rocks approach in which the cultural backgrounds of students are more celebratory in nature; not authentically woven into the day to day operations of the classroom, or as a colorblind approach in which the idea of “sameness” is emphasized (Doucet & Adair, 2013). As a result, Paris (2012) offers culturally sustaining pedagogy to move beyond being relevant, but rather fostering and sustaining culture within schooling experiences. This means that the relevant backgrounds and cultural experiences of children are not simply used for the design of learning experiences, but these practices are rather perpetuated for the children. In this way, cultural practices are carried on between generations. Additionally, Paris and Alim (2014) assert that as society shifts and evolves, so does power and those who hold power. It is the responsibility of educators to prepare children for success in present and future endeavors.

Boykin and Noguera (2011) focus on opportunity to learn as a mechanism for addressing the achievement gap evident in the U.S. In doing so, they call attention to four practices for diverse populations of students to simultaneously raise achievement scores while preparing these children with 21st century skills. These practices are: focus on student engagement, interpersonal relationships between educators and students as well as amongst students, classroom teacher experience in working with these populations, the creation of high learning expectations for all students and student functions of self-efficacy, ability beliefs. This approach seeks to not only sustain the cultural values of students, but lays focus to using assert pedagogies and the skills necessary to access power within society (Paris & Alim, 2014). Furthermore, Boykin and

Noguera highlight that as educators begin to focus on the backgrounds and interests of their students they enhance student buy-in through their acknowledgement of students out of school experiences and other relevant information. This, in effect, can enhance the performance of students.

Funds of Knowledge (FoK). Drawing from sociocultural theory, Hedges, Cullen and Jordan (2011) combined elements of sociocultural theory with a funds of knowledge (FoK) framework (Moll, Amanti, Neff & Gonzalez, 1992) to examine the ways educators identify and engage with 3 and 4-year-old children's interests in relation to funds of knowledge. In this work, children, their families and their educators engaged in interviews, collection of field notes and generation of photographs to examine ways in which the children's out of school experiences could be used as a springboard to learning in the classroom. It was found that the interests of the children were stimulated through attention to FoK; however, educators did not often take full advantage of the community influence on children. More often, the educators focused on the interests and experiences of children that more closely aligned with those interests and priorities of the educator. In this way, the dominant discourse of school continued, instead of emphasis being placed on leveraging the experiences of the children outside of school.

Hogg (2011) referred to FoK as pertaining to the underlying competencies and knowledge a person has based upon their own life experiences. It is with this definition Hogg engaged in a systematic review of FoK research across elementary, middle and high school. Similar to Hedges et al. (2011), it was found that sources influence FoK may include children's homes, families, and community, as well as elements of pop culture. Furthermore, across the literature differing ideas regarding whose knowledge about children was valued ranged from the child themselves, parents, other household members, educators and community members. Rogoff

(2003) and Woodhead (2006) would maintain that all these parties are critical in the development and experiences of the child. The question remains that as educators work towards this type of transformative teaching, what is needed for them to engage in this work (hooks, 1994). One recommendation is a reconceptualized view of ECE and the capabilities of young children.

Socio-Cultural Perspectives. Edwards (2003) proposes a timeline of the theoretical underpinnings of Early Childhood Education (ECE) noting that while prior work in ECE has stemmed from the tenants of Developmentally Appropriate Practice (DAP) and the work of Piaget, recent endeavors in the field are working towards a reconceptualization of what is considered “appropriate” for children, moving beyond an age milestone to exploring the experiences that shape the lives of students as impactful on learning.

A focus on how the social and cultural backgrounds of students are infused into learning was an underlying theme within Vygotsky’s socio-cultural perspective (Edwards, 2003; Rogoff, 2008, Vygotsky, 1978). This call was extended placing increasing emphasis on the child’s home and community (Edwards, 2003) such that the development of children is greatly impacted by their participation in sociocultural activities which exist in the communities they live (Rogoff, 2003).

Rogoff emphasizes that as communities change and evolve, the members do as well, thereby requiring an approach to early childhood education which is reflective of, and responsive to, this process. Rogoff refers to from three planes, intrapersonal, interpersonal and institutional, that work in combination to influence the child. The intrapersonal plane is focused around the development of the individual child, whereas the interpersonal involves the interactions among social partners (i.e., family members, friends, community members) involved in the children’s experiences. Finally, the institutional plane highlights children’s development as it relates to the

context in which they are in. It is through the interaction of these three plans of influence that children develop thereby not indicative of a numerical age or milestone, but rather a set of unique interactions and experiences.

As educators work within the classroom to acknowledge and leverage the home and community culture in which students come from, Edwards (2003) articulates three pathways for engagement in critical perspectives of ECE: assimilation positivist, transformative, and social constructivist. In taking the assimilation positivist path, educators work to embed sociocultural development into previously accepted developmental milestones. The present day version of DAP is one such examples of this approach. A transformative path highlights the match of cultural and interaction patterns such that development of children is framed as connected to their experiences as participants in a cultural community, thereby focusing on the multiple planes of development for children. Finally, in a social constructivist path, educators work to merge ideas from multiple theoretical perspectives in which learning is built upon the relationships between the children and their communities to evoke learning opportunities.

Social Justice in ECE. Along with focus on acknowledging children as members of a community, lessons revolving around social justice seek to promote children as advocates and promoters of a more just society (Bartell, 2013). Attention to social justice teaching in the early grades stems from teaching focused on using an equity pedagogy. It is asserted that if an educator does not work to combat injustice, then they are in agreement of it (Hyland, 2010). This coincides with the political nature of teaching and learning within a school setting such that educators may be engaging in this work, to which Fennimore (2008) reminds us that vigilance to persist in this work is critical.

Picower (2012) outlines six elements of social justice design for elementary age

classrooms. These elements begin with an appreciation for oneself, move to respecting others, addressing issues of injustice, understanding social movements to evoke change, raising awareness, and finally culminate with social action. The final two elements, involving action against injustice, are less frequently addressed within lessons at the elementary level.

Critical pedagogy is seen as one approach for addressing issues of inequity within the classroom as children explore issues of both privileged and marginalized groups (Hyland, 2010). From this focus of study, young children are encouraged to take action against issues within their community. In planning for this approach, educators must remember that what we do not say is just as important as what we do say as the inclusion or exclusion of topics during discourse greatly impact the work with young children (Boutte, 2008). Furthermore, language, including that what is presented within curricular resources, typically embody the same language and perceptions from society. Therefore, if this is representative of a deficit perspective, it is the objective of educators to confront this language and advocate for more constructive dialogue.

Mathematics Teaching

Although commonly believed as a “universal language”, mathematics is not in fact culture free or without bias. Much of what children see as meaningful in mathematics stems from their determination of how the mathematics connects to their own lives. In this way,

Mathematics practices cannot be disembedded from social context, and that creating a zone of mathematics practice depends on not only the store of FoK, but the transformation of that knowledge into meaningful activity. (*Gonzalez, Andrade, Civil & Moll, 2001, p. 130*)

The mathematics children are exposed to in school is seen as a type of ethnomathematics referred to as school based mathematics (R. Gutierrez, personal communication, October 1, 2016). For children, there is a certain way that school based mathematics is done, a certain list or series of topics undertaken as units of study that may or may not connect to their home lives. The pedagogical moves, or strategies, used in the classroom reflect the way that mathematics is being done in society (Gutierrez, 2002), rather than necessarily mirroring the way mathematics is done within the individual child's culture.

The national focus on providing equitable mathematics instruction for all learners is not a new shift, but one that the National Council for Teachers of Mathematics (NCTM) began to explore through their equity standard. The focus of this standard highlighted all children having access to high level mathematics instruction, taught by educators who had strong knowledge in both content and pedagogy (NCTM, 2000). Placing emphasis on teacher instructional practices, NCTM (2014) issued *Principles to Actions* to describe the teaching moves in which to address the earlier issued *Principles to Standards*. Within this piece, NCTM (2014) reiterates a focus on keeping all children engaged in mathematics through connection to real world ideas including leveraging children's culture, language and communities of practice. Furthermore, key instructional pedagogies such as the use of rich problem solving scenarios and open-ended questions were recommended.

Early Childhood Mathematics Teaching. Young children vary in their experiences with and preparation for school based mathematics instruction. In addition, their views and perceptions of mathematics are often different than adults (Clements & Sarama, 2014). Clements (2004) recommends that when planning for mathematics instruction with the youngest learner that educators draw from the experiences, backgrounds and interests of the children, merging this

idea with what the educators believes the children are capable of doing. This idea is further echoed in a position statement from the National Association for the Education of Young Children (NAEYC) and NCTM (2010) conveying that good mathematics teaching for young children should build on cultural, linguistic and community backgrounds of learners. The position statement cites examples such as teachers' knowledge of the varying languages that are spoken in the classroom and how numbers are said in these languages, making connections to children's home mathematics and providing multiple strategies for learning. Furthermore, NAEYC and NCTM advocate for mathematics instruction which support children in making sense and connecting to both the physical and social world around them.

One approach recommended for working with young children in the area of mathematics is the use of problem solving or word problems to work towards mathematical understanding (Clements & Sarama, 2014; NAEYC & NCTM, 2010; NCTM, 2000, 2013). These problems should emerge from a variety of contexts that children can connect with, such that children are able to make meaning of both the mathematics and situation being presented (i.e., content and processes) (Clements & Sarama, 2014).

Another approach that is frequently used is to gain understanding where students are developmentally in mathematics, and move them forward to appropriate next steps in mathematics by describing the goals of learning mathematics, varying levels of thinking and learning as well as learning tasks children might engage in (Clements & Sarama, 2014). While this approach seeks to meet students where they are, it is still aligned to a developmental continuum in which students demonstrate mastery of one topic prior to moving on to the next. This often results in emphasis in kindergarten being on mathematics which has already been

mastered (Clements & Sarama, 2014). Furthermore, this progression does not accommodate for attention for the sociocultural backgrounds students bring with them to mathematics tasks.

Culturally Relevant Mathematics Teaching. At any age of mathematics instruction, there should exist a concern for equity in mathematics (Clements & Sarama, 2014). Aguirre, Mayfield-Ingram and Martin (2013) share five equity based practices to support children's construction of mathematics knowledge: going deep with mathematics, affirming learning identity, challenging marginalization, using multiple resources of knowledge, and leverage competencies related to mathematics. In doing so, teachers work to draw upon the many identities children possess as doers of mathematics, such as how mathematics, or mathematical strategies are used within the community of the child.

Strongly rooted in the FoK framework, culturally relevant mathematics teaching focuses on Presmeg (2007) who asserts that within mathematics, movement beyond the non-dominant perspectives should be taken. This can include the inclusion of critical or political perspectives in mathematics. Culturally relevant mathematics tasks should be rich in mathematics content, but also contain a connection to the community practices evident within the makeup of the classroom (Civil, 2007). As children bring their experiences and culture with them to academic study, they should be accounted for within the classroom when engaging in instructional design.

In an effort to move towards child centered practices and merge the at home and school mathematics practices, Lipka, Hogan, Webster, Yanez, Adams, Clark and Lacy (2005) sought to connect children's identity to the mathematics content being taught. In their collaboration with Yup'ik elders, children, schools and communities, they constructed Math in a Cultural Context (MCC) which highlighted the local cultural tasks, such as building a fish rack and the related mathematics content. Following the work of two educators of this curriculum, each approached

their teaching in different ways. Lipka et al. note the sense of community developed among the stakeholders through the use of MCC. This creation of a culturally based curriculum, referred to as a “third space” helped to benefit the children by simultaneously building mathematics and cultural identity (Lipka et al., 2005).

Often times, attempts to bridge community connections and classroom practice are met with resistance or fail to adequately connect community and mathematics, with the mathematics being hidden (Civil, 2007). In other instances, working to incorporate FoK into mathematics is seen as challenging pre-existing structures and educators of privileging their own views of what mathematics should be, countering what happens in the home and reinforcing a power struggle between families and schools (Wagner & Whyte, 2013). Presmeg (2007) reminds us that culture in a mathematics classroom is evolving and negotiated based upon its occupants.

Sociopolitical Perspectives in Mathematics. Within society as a whole, there exists a perception that understanding elements of both mathematics and statistics provides access to the dominant discourse of power (Frankenstein, 1983) and deviation from the capability to understand mathematics abstractly indicates inferiority. Educators must acknowledge and understand that not all students from one culture are the same (Gutierrez, 2013) and that the dominant mathematics being taught in schools reflecting the status quo of society may be misaligned to some. Gutierrez (2002) advocates for the addressing of critical mathematics, in which power dynamics in society are unpacked and addressed through mathematics. Educators must begin to question who is mathematics constructed *by* and whom is it *for* within society and the political practice. In doing so, a focus on learning and equity as not only access and achievement, which are more dominant perspectives, but also

as power and identity, more so critical perspectives (Gutierrez, 2012) is at the forefront of teaching and learning.

It is through an avenue of not simply understanding mathematics but engaging in mathematics to transform social practices that the sociopolitical components of TMfSJ emerge. Through a development of political awareness and motivation to action in learners and educators can support the deconstruction of current beliefs, supporting creative defiance of categories and labels placed upon people by society, as well as helping to generate a sense of agency in learners (Gutierrez, 2013). This development of agency, even in the youngest learner, can seek to improve society for children and families who have been, or continue to be previously marginalized due to their background.

Teaching Mathematics for Social Justice (TMfSJ)

The underlying theoretical belief that both social and cultural perspectives are vital when discussing the learning of children (Vygotsky, 1978) is important when discussing TMfSJ. Rogoff (2003) asserts that the home and community contexts that children are members strongly impacts their development, and that these cultural communities promote change. Within the banking model of education, educators are seen as possessing the power, distributing knowledge to students (Freire, 1970/2005). This approach to teaching and learning contrasts approaches which work to leverage the knowledge of students about their lives, recognizing them as experts in this area. In considering the lives of children in planning, Gutstein (2012) defines three specific types of knowledge required by teachers: community, critical and classical knowledge. Community knowledge closely relates to the FoK students bring with them to the classroom; critical knowledge relating to knowledge of the sociopolitical context in which schools function;

and classical knowledge relating to the formal knowledge of school mathematics students should possess.

Defined as mathematics used as a tool to understanding life, power and societal issues (Gonzalez, 2009), TMfSJ contains a combination of pedagogical goals for mathematics and social justice elements (Gutstein 2006) with its main goal is for students to engage in what Gutstein (2003) calls reading and writing the world with mathematics. In this way, the teacher and children are collaboratively constructing knowledge about the world, using this knowledge to help begin a cycle of change. It is emphasized that TMfSJ is not just for marginalized children, but rather for anyone who desires to educate about societal differences (Gutstein & Peterson, 2013). As such, working to infuse TMfSJ into mathematics for any child is critical for them to make sense of the world in which they live.

In an attempt to engage in this work, educators will make use of the three types of knowledge outlined above (Gutstein, 2012; Turner, Gutierrez, Simic-Muller, Diez-Palomar, 2009), making sure to develop community knowledge prior to developing a curriculum pathway for children (Gutstein, 2012). Through this community knowledge, educators can prepare children to critique the world and political institutions on place through the use of mathematics. In this way, they are building their mathematical power and capabilities to evoke change (Gutstein, 2006).

Current Trends in TMfSJ. With much of the work in TMfSJ being in its infancy in the mathematics education world, researchers have reported educators having difficulty in balancing the social justice elements with mathematics content (Bartell, 2013; Gregson, 2013; Tuner, Gutierrez, Simic-Muller & Diaz-Palomar, 2009). Gregson (2013) completed a case study in which she explored the experiences and culture children brought with them to academic study.

Collecting interviews, children's work samples and video data she found that educators struggled with balancing the teaching of dominant mathematics with supporting children in building independence in mathematics concepts. In addition, educators demonstrated difficulty balancing time teaching pre-requisite mathematics concepts and embedding social justice themes. As a result, one area was often left out of lessons. What Gregson did find beneficial to the educators was the use of compelling topics and questions for use in the classroom. These topics can be developed following the educators understanding of community knowledge prior to developing a planned curriculum or instructional approach to infusing social justice into mathematics lessons (Gutstein, 2012). Gonzalez (2009) asserts that although educators may be acutely aware of the injustices being faced by children, they often have their own misunderstandings or unclear definition about TMfSJ which results in their inability to navigate the lack of support often provided from educational stakeholders. As a result, the process of developing a TMfSJ within instruction has been deemed time consuming and requiring a varying skillset of how to navigate school culture (Gutstein, 2012). For emerging educators this task can be daunting and overwhelming as they engage in other professional responsibilities.

Based on this, it is essential that children become active co-constructors of the social justice idea that is being explored, rather than the educators thrusting one upon them. This idea is echoed in the work of Stinson, Bidwell and Powell (2012) as the second and third author reflect on their own experiences TMfSJ with high school and college aged students. It is through this reflection the authors advocate for the voices of both children and educators to be included within the planning process as active constructors of knowledge regarding social justice themes. The idea of collaborative co-construction of lesson topics with children is additionally important in building the child's sociopolitical consciousness (Gutstein, 2012). This co-construction

emphasizes a further call for TMfSJ lesson to be both provocative for children, opening up their eyes to justices within the world as well as containing a personal relevance for children (Stinson et al., 2012). It is through this personal relevance that children can begin to become active advocates for just practices within society.

Following consideration of the backgrounds and experiences of children in the classroom, a deliberate and intentional connection between mathematics and social studies can be a viable starting point for addressing social justice topics (McGee & Hoestler, 2014). This can serve to authentically incorporate the community within the project itself, making careful considerations to balance mathematics content and social justice ideas (Turner et. al, 2009). Educators often require many examples of TMfSJ as it is a complex process requiring investigation of mathematics which has been socially constructed for a dominant culture and experiences and issues faced by children in the classroom (Leonard, Brooks, Barnes-Johnson & Berry, 2010). As educators engage in this process, they are able to simultaneously learn about the social justice issues being faced by their children (Gutstein, 2009). Working with 8th grade Latino/a children over a two-year period. Gutstein (2003) focused on supporting them to understand mathematics in the real world while simultaneously working to advocate for change in social justice issues. In doing so, he began to explore and unpack the issues faced by his students, as well as provide them with a voice to advocate for change in the social justice issues they felt important. This, in effect, helped them to develop mathematical power, or the ability to see the world through a mathematical perspective.

While headway is being made within the field of TMfSJ, one common perspective missing from the literature base is that of practitioners engaging in this work with young children, age three to grade three. As an emerging area, this viewpoint is beginning to make

headway in the research field with scholars exploring the concept of fairness with young learners. One example is Chao and Jones (2016) collaborative work centered around using mathematics to understand elements of fairness within skits about Rosa Parks and Harriet Tubman. Within a preschool classroom, Chao and Jones worked to connect social justice (the treatment African Americas during pre-civil war times) with mathematics content such as counting. This presentation of TMfSJ supports what hooks (1994) calls for; the exploration of the knowledge and experiences teachers and/or teacher educators require to engage in this transformative teaching.

Chapter Summary

In this chapter, research from major areas which will inform my work were presented. These included critical perspectives in early childhood education including attention to reconceptualizing early childhood, CRP, FoK, and a social justice focus with young children. From here, exploration of mathematics teaching practices at the early childhood level was presented focusing on culturally relevant mathematics teaching, transitioning into TMfSJ trends and gaps.

CHAPTER THREE

METHODS

This chapter outlines my chosen research design, autoethnography, providing a rationale as to why this is an appropriate choice for completing such work. Additionally, this chapter will showcase my context for data collection, data sources, analysis methods and my dual roles as both the practitioner and researcher within this study.

The purpose of this study was to answer the overarching question of *What are the experiences of an early childhood educator working towards teaching mathematics for social justice?* In order to address this question, I used autoethnographic approaches (Ellis & Bochner, 2000) to tell my story. I aimed to explore my experiences as a university researcher who re-entered a classroom of four and five-year-old children and worked to incorporate culturally relevant pedagogies, specifically teaching mathematics for social justice, within my practice. During my prior work as a kindergarten educator, teaching mathematics for social justice was not an emphasis, yet the literature on engaging in this work with young students is minimal. Morrow (year) shares that research within a critical approach helps to promote dialogue, changes in practice and is overall catalytic in nature. The voice of an educator engaging in TMfSJ, let alone one doing the work with young children, is currently underrepresented within the research literature and therefore presented a space in which I could provide my story.

My own self-reflections on how I might have taught differently, as well as how I might better prepare pre-service teachers I work with to engage in this work served as the impetus for this study. As such, the use of autoethnography allows me the space to not only explore my

experience, but tell the story of my experience to an audience of educators who might relate to it in some way.

Epistemological Considerations

The purpose of this qualitative study was to explore both the success and struggles as I worked with four and five-year-old students to integrate social justice within mathematics problem solving situations. As I explored my own experiences engaging in this work, this study was both personal and situational (Stake, 2010). Furthermore, by analyzing the generated data using a narrative approach I am able to tell the story of my experiences in a way that allows the readers to make meaning. This method is aligned with qualitative research, specifically autoethnographic approaches.

Qualitative research is identified as research relying on the collection of non-numerical data, which is analyzed primarily in accordance with human perceptions and interpretations (Stake, 2010). The in-depth analysis conducted from the data provides the researcher with vital understandings specific to the context in which they are working. This knowledge allows the researcher to embark upon a journey to evoke a deeper understanding of the situation and context, thereby disseminating this understanding beyond the classroom setting.

Consistent with critical approaches to research in which Freire (1970, 2005) places emphasis on people living “in” and “with” the world to become active change agents, this study aims to act as a stimulus for change in my own practice (Cochran-Smith & Donnell, 2006; Mockler, 2014; Perry, Henderson & Meier, 2012; Zeichner, 2009) as well as support young children in identifying how math can be used to understand social justice issues. In addition, by understanding that as knowledge is constructed it can be extended to a larger view (Cochran-Smith, 2005; Cochran-Smith & Donnell, 2006, Hatch, 2010 in Perry, Henderson & Meier, 2012),

I hope to use my new learning to stimulate discourse in the field around using TMfSJ with young children.

By undertaking this dissertation, I worked towards providing the story within the TMfSJ literature that remains lacking; that of an early childhood practitioner who is beginning to engage in this work. The resulting narratives help to chronicle the journey of my experiences such that others may be able to connect to having similar experiences, or have knowledge of someone who has had similar experiences.

Autoethnography

With variances in qualitative research, I have selected autoethnography as a mode for research in order to capture my journey into TMfSJ with Kindergarten aged children. It is the open and authentic exploration of this process which informs not only the work of other classroom educators engaging in this work, but also teacher educators who are seeking to have their students engage in this work with our youngest learners by providing insight into the feelings and lived experiences of those trying to TMfSJ. Furthermore, with my role in developing and administering professional development for Kindergarten teachers, this work supports my coaching of others in a movement towards TMfSJ with young children.

Used to connect autobiographical accounts to personal, cultural and social experiences, autoethnography aims to systematically analyze the researchers' experiences in order to understand a culture or group in which they are a member (Reed-Danahay, 1997; Ellis, 2004; Ellis & Bochner, 2000). In this way, it seeks to utilize personal experiences to illustrate the aspects of a culture, group or experience being explored (Ellis, Adams & Bochner, 2011) as the author / researcher simultaneously engages in both roles to better understand a particular way of life (Reed- Danahay, 1997).

Beginning with a purpose or question tied to the researcher's own personal connection or knowledge of a lived experiences, the researcher themselves, serving in this dual role of author and researcher, guides the inquiry (Ellis & Bochner, 2000; Hughes, Pennington, & Makris, 2012). Detailed source of evidence may be generated (Hughes, Pennington, & Makris, 2012) such as field notes, thick descriptions and artifacts (Ellis, Adams, & Bochner, 2011) such that outside readers are fully immersed in the narrative created. Additionally, storied experiences are provided to present the researcher's experience during the on-going investigation. Within this study I aimed to provide a tale of my design and implementation of TMfSJ lessons within an early childhood classroom setting. In this way, my experience was the focus of the research.

These critical moments which the author / researcher has written about their experiences as members of a group can be later used for interpretation (Ellis, Adams & Bochner, 2011; Ellis & Bochner, 2000). From here, the author / researcher provides an interpretation of the experiences (data) collected over a period of time (Ellis & Bochner, 2000), crafting a truthful and coherent telling of the story (Ellis, Adams & Bochner, 2011). Overall, the focus of an autoethnography is the creation of meaningful research, which can connect with people who have had similar experiences, or those who know people with similar experiences (Ellis & Bochner, 2000), thereby allowing readers to begin to understand the experience as it connects to their meaning that the readers is able to connect with the story as it speaks to them (Ellis, Adams & Bochner, 2011; Hughes, Pennington & Makris, 2012).

Context

The school in which I conducted my research is an early childhood lab school located on a university campus in the Southeastern United States that serves children from the ages of two to five years old. The school engages in constructivist approaches to teaching and learning, with

a focus on children and teachers using inquiry as a platform for learning. The overall population of children attending the school is diverse, with a variety of language, ranges of socio-economic class, and ethnicities. Selection of this particular school site took place as a result of its partnership with the department, as well as my own experiences collaborating with the director and the teachers. In addition, prior to the onset of this study I engaged in professional development experiences with both the lead classroom teachers, assistant teachers and pre-service teachers working at the school.

Children apply to attend this particular school, with enrollment open to the children of faculty members and students, as well as children from families in the local community. As part of this schools' engagement in project work, the interests of the children are supported through extended work periods in which children explore learning opportunities related to their topic of study while simultaneously demonstrating proficiency in the early learning standards for the state. During the summer semester, late May to the end of July, the school is open for summer enrichment programs that are attended by children between the ages of two and six.

Participant Selection. Children were selected through “purposeful sampling” (Patton, 1990) in which I identified children who met a minimum criteria set forth for the study. For this study, the minimum criteria to participate included: being four or five years old, attending the school for the duration of the summer project (from early May to the end of July), and a signed consent form (Appendix A) from the parents or guardian for their children to engage in the study. Also included in the signed permission for was permission for children to be video-taped and use of children's work samples through photographic documentation. Additionally, as children were active participants in the study, their assent to participate in the study, be video-taped and provide work samples was also obtained. Based upon the minimum criteria a pool of

36 possible children emerged, of which 13 returned permission forms and 9 assented to participation. The table below (Table 1) outlines the children I worked with during the study and their demographics.

Table 1: Demographics of Children Working on TMfSJ Lessons

Student Pseudonym	Age	Gender
Caleb	5	Male
Leo	5	Male
Oscar	5	Male
Ronald	5	Male
Andrea	4	Female
Andrew	4	Male
Anthony	4	Male
Liz	4	Female
Natalie	4	Female

Timeline. Preliminary meetings with children that were possible participants took place between three days a week from the middle of May to the end of June. Prior to and during this time I was also a part of lesson planning meetings with the classroom teachers at the site and able to gain knowledge about the children’s mathematics understanding from work samples and assessment tools. Furthermore, this time allowed me to become aware of the studies currently occurring within the classrooms my children would be in for the summer. IRB approval (Appendix C) was obtained on June 21, 2016 and formal data collection began on June 27, 2016 and continued until July 19, 2016. During data collection, I was present at the school site

between three and four days per week from when VPK started at 9:00 AM until approximately 4:00 PM.

An initial two-day lesson sequence was planned to help me gauge the mathematics knowledge of children and unpack ideas of equality versus equity prior to TMfSJ lessons began. Lesson concepts took between three and four days to implement over the month of July. Figure 2 outlines the sequence of data collection for this study.

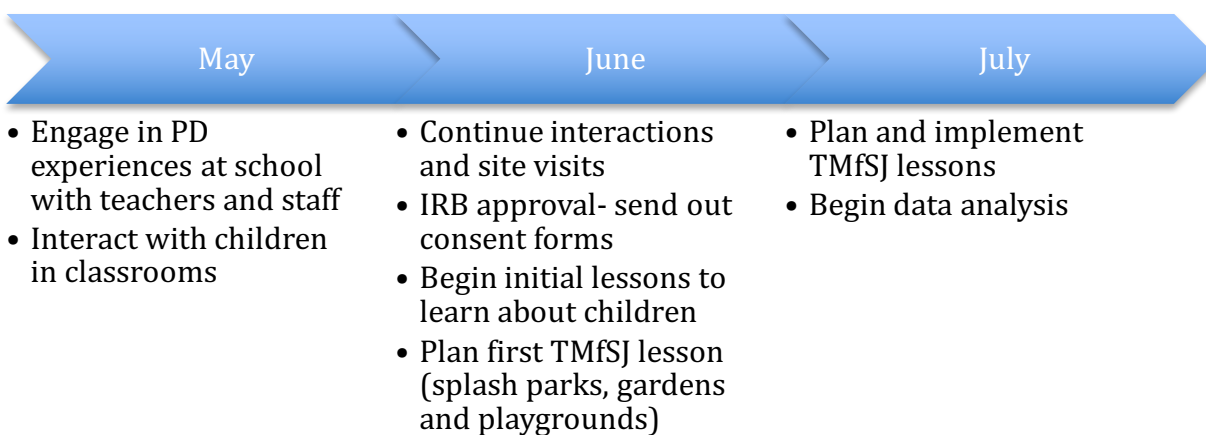


Figure 2: Timeline of Study

Prior to beginning the TMfSJ lessons, I created two lessons to help get to know the children I would be working with. The first lesson focused on gathering informal assessment data surrounding the children's knowledge of standards related to counting and comparing numbers (Appendix E). Once this lesson was implemented, I designed a lesson to support the children in exploring the concepts of equal vs. equality (Appendix F). This led to a discussion centered around the differences between the two constructs. For this lesson, an image was used which depicted children watching a baseball game (in Appendix F). In the first image, all children were unable to see the game. A second image presented all children standing on the same size box leaving one with a fully obstructed view, while a final image presented each child standing on

boxes or varying sizes and all being able to see the game clearly. As part of this lesson, children constructed representations of equality (Appendix G).

Lessons Implemented. For the first lesson I created a standalone lesson to gather formative data on the mathematical understanding of the children with whom I would be working. This lesson focused on children's understanding of numbers from 0-15 in an attempt to both count and compare sets of objects with up to 15 items. I chose this avenue to explore mathematically as the early learning standards in our state highlight counting and comparing, as do the Kindergarten math standards children would be working towards the following school year. Although the early learning standards focus on counting up to 30, I decided to begin only going to 15 so that I could gain background on the learners and determine where differentiation through number choice could occur. Social justice issues infused within the lessons stemmed from children's conversations and interactions with myself.

To this end, I used the early learning standards provided as a focus for content addressed during TMfSJ lessons. While I planned lessons to address this content, I attempted to embed social justice topics within the lesson experiences in a way that mathematics learning was parallel to social justice foci. This was done so that children might begin to see such mathematics as a powerful tool by which they understand, participate in and change the world. Social justice foci for the series of lessons represented conversations that centered around several varying topics. Table 2 outlines the lessons presented, their duration, connections to both social justice topics and mathematics content, and culminating product.

Table 2. Overview of Lessons Implemented

Lesson Concept	Lesson Period (Days)	Social Justice Topic	Mathematics Content	Culminating Experiences Product
Splash parks, gardens and playgrounds (Appendix H)	(4 days) July 1, 5, 6, 7	Income	Counting and comparing	Movie
Child Hunger (Appendix I)	(3 days) July 11, 12, 14	Food insecurity in children	Subitizing, counting, comparing	Shared writing letter (Appendix J)
Financial Inequalities (Appendix K)	(3 days) July 15, 18, 19	Race and income connection	Subitizing, counting and comparing	Shared writing letter

Lesson culminated with a concluding activity in which the children present what they have learned, brainstorming and generating artifacts that can be used to spark discussion for change (i.e. narrative stories, artistic representations, media presentations). Furthermore, a social justice framework asserts that students also begin to see the connection between mathematics and their own histories (Gutstein & Peterson, 2013).

In order to ensure both content and social justice issues are being addressed, a modified version of the concept-planning template I have used and is also used by the local school district was adopted (Appendix D). The premise of this template is that it is used to plan for a concept within mathematics, typically encompassing a series of days rather than one single day. Included within the modified version was space to identify the social justice issues being addressed within the lesson or how the mathematics is being used in order to understand more about a pressing issue within the lives of these children and their community. In this way, both a social justice

focus and mathematics content was planned to be integrated into a series of lessons, rather than simply occurring in coordination with one another.

Over the course of the study a series of three concepts were addressed, and each concept plan lasted between three and four days as outlined in table 2 above. Planning was completed outside of the hours I was in attendance at the school. Lesson plans for weekly group meetings included the following elements: objectives for both mathematics and social justice, materials for use in the lesson, both teacher and student procedures, questions to be asked during the lesson, assessments measures (both formal and informal) and a culminating product that would support the children in taking action against the issue being explored.

Lessons were designed to be connected to one another in respect to both mathematics and social justice concepts being examined. During initial lessons, lessons focused on children engaging in elements of one to one correspondence such that they were unitarily counting objects. The lessons then transitioned to involving children in working with numbers between 10 and 30 (as indicated within the early learning standards). From here, children's work with numbers were extended beyond rote counting to also include elements of subitizing in which they move towards more instant number recognition through dot representations and instantly recognizing digits and being able to create a set of that many objects. This involved them in applying the one to one counting and correspondence they are worked on during the school year and early explorations. Furthermore, children began to transition seamlessly from set representations, which were largely concrete in nature, to number representations which were more abstract, and back again.

Social justice topics were connected through the addressing of issues related to access and equity during the lessons. Stemming from the initial lesson on splash parks, gardens and

playgrounds, components of who had access to these playspaces in the community was a foci, as was examination of the differences in overall access (i.e. comparison of quantities). For the child hunger lesson, children again explored ideas of access to food within the community. Finally, in our final lesson set on financial inequalities conversations centered around equitable distribution of money based on race.

In trying to determine social justice themes to focus on I sought input from the FoK I observed children using during their experiences at school. During our initial splash parks, gardens and playgrounds lesson I wanted to connect to the topic of study within the classrooms of these children. At the time, they had been studying their school playground; the features of it, how they might redesign it, and how it compared to other play spaces in the area. I wanted to build off this topic as the children had decided upon this avenue of inquiry within their classroom. The decision to include gardens came from an earlier study of plants and gardens I knew the children had engaged in during the year. Splash parks were included as they were an element attached to some of the playspaces in our community.

Child hunger, the emphasis within lesson two, was something that I was not completely sure my children had background on. At the school children were provided breakfast and snack but they all brought their own lunches. During the plant and garden study earlier in the year they had examined how people would grow their own food, but the idea of not having access to food was not necessarily something they had knowledge of. I had only learned of the statistics for the area myself about a year or so ago, but believed it could be a topic the children might be able to understand and be sympathetic to as it impacted other children.

For the final lesson set on financial inequalities I had observed the children taking an interest in interacting with and distributing the newly acquired play money during time in their

housekeeping center. New materials had been purchased and given to classrooms at the school during the course of my study, including a cash register and play paper money/ coins. These items had been limited prior to their introduction during the summer and for many of the children became a new and novel material they could play with during exploration time. From talking to some of the five year old children I knew that a few of them had small jobs or chores they were responsible for completing at home in order to earn either small amounts of money or items they wanted. I wanted to build on this idea of earning money for a job, but examine it more closely with respect to issues of equity. This desire led to the exploration of pay and race.

Data Sources

An integral element of autoethnography lies in attention to authentic and detailed accounts within both data collection and presentation (Ellis, Adams, & Bochner, 2011). Within this study, detailed data collection was obtained through the use of a researcher reflective journal, documenting the journey of the researcher, and video recorded implementation which was later reviewed to provide rich contextual background for interpretations and narrative construction. These sources supported me in close examination of my experience as I worked to engage in teaching mathematics for social justice. Additional documents, such as student work samples and photographs of student constructed artifacts were also used as secondary sources. A file folder was created for each lesson done with the children containing a copy of the lesson plan, lesson implementation video, and associated work samples or artifacts. Reflective journals for planning and implementation were kept in standalone documents which were added to throughout the study.

Researcher Reflective Journal. According to Janesick (2011) the researcher reflective journal aides a researcher by developing a focus on awareness of self, supporting the

development of new questions, refining the role of researcher and exploration into their experiences. The research journal aided in the refinement of my interpretations as to why this work was hard and provided the space in which I could record my feelings, interpretations and questions around the lessons as I planned and implemented them. I used the researcher journal as the primary data source within the study. Cochran-Smith and Donnell (2006) assert that the reflective journal offers practitioners a written record of teaching and learning; a space by which they can explore their work in a precise manner, thereby addressing the issue of systematically studying ones' own practice. Additionally, by doing so in a clearly planned way, practitioners address issues of intentionality.

The journal was kept for the duration of the study, June 27, 2016 until July 19, 2016 as a word document on my password protected computer. Names of teachers, children and the school were changed as required by the Institutional Review Board. A separate document for lesson implementation reflections and lesson planning reflections was kept in order to organize the data. Journal entries were completed immediately following planning and implementation sessions to chronicle experiences and interactions while they were robust in my memory. All entries were date and time stamped, with the planning and implementation documents being combined at the culmination of the study to explore the chronology of the experience. In total, the entries spanned 20 pages.

Entries focused around the events that occurred during the lessons, as well as my experiences and reactions to these events. They were not limited to solely what occurred during the planning or implementation of a lesson but open to infusion from the context in which I was working. Information obtained through work with children and other educators informed entries within the reflective journal, as they were critical in chronicling my journey. Through this

practice, I could identify many of the struggles I experienced during this process. It also provided a space by which I could brainstorm ways to overcome potential challenges within the research literature (i.e., time, support from stakeholders). The reflective journal represented a sort of vessel in which I could deposit my thoughts and feelings as they related to the process of doing this work.

Video Taped Lesson Implementation. As lessons are presented to students they were videotaped using my MacBook Air computer's photo booth application. I positioned the laptop such that the entire work of myself and the children was captured. When meeting with the children to implement the lessons, we moved to varying areas of the classroom which were not being used by other teachers and children at that moment. For example, in several of the lessons with the older group of children we moved to a small kidney table in the back corner of the classroom. On some instances, we moved to a second classroom which, due to limited children enrolled during the summer months, was empty.

Lessons where we were involved in working at a table, the laptop was placed on an adjacent table so that the entire work space, myself and the children were included in the image. For lessons where we were sitting on the floor in a large group meeting area, the laptop was placed on chair with the camera angled down so that the entire group meeting around was captured. In this way, I did not edit the video data by panning and zooming during capture, but rather could edit later on during the analysis process.

To capture audio in addition to what the camera captured, I used a lapel microphone attached to my iPhone. By using this device, I captured my conversations with children and groups of children as we collaboratively engaged in discourse around the content and social justice elements being discussed. Furthermore, I used this audio to compare the audio captured

within the video to that of the microphone for more accurate transcription. The setup was tested prior to the first lesson implementation to record children playing a mathematics game with me which was not related to the study so that children had exposure to the process of videotaping prior to data collection.

Consistent with Papademas and the International Visual Sociology Association Statement (2009) children were asked to consent verbally prior to recording videos. In addition, other employees at the school were informed that video recording was occurring so that they knew where and when the recording was taking place. In this way, they were able to avoid the area and not be captured. Videos were recorded for the duration of each lesson implementation. As lessons spanned multiple days, recordings were indexed using the date (month.day.year), lesson number (i.e.,1) lesson part number in a lowercase letter (i.e., a), and group identifier (a or b). The approximate duration of video data was 18 hours.

Student Work Samples and Artifacts. Student work samples and artifacts were collected from each lesson in order to provide artifacts as is consistent with autoethnographic work (Ellis, Adams & Bochner, 2011). These artifacts helped, in the moment, to identify areas in which the children were having success or challenged with the presented lesson and/or topic. They were also used to document children's abilities to understand and engage in the content presented. In this way, they were then used as evidence of when I struggled or successfully highlighted the social justice or mathematics component.

Prior to collecting student work samples or artifacts, including photographic images, children were asked permission for these samples and identifying information was removed (Papademas, 2009). Work samples or images of artifacts were saved following as pdf or jpeg

files using the naming scheme of date (month.day.year), lesson number (i.e.,1) and lesson part number in a lowercase letter (i.e., a), as was consistent with the video saving scheme.

Narrative Construction

Through a careful and intricate fusion, the construction of my narrative comes from both my own memory during and after the experience, but also from the data sources collected and documented throughout the study.

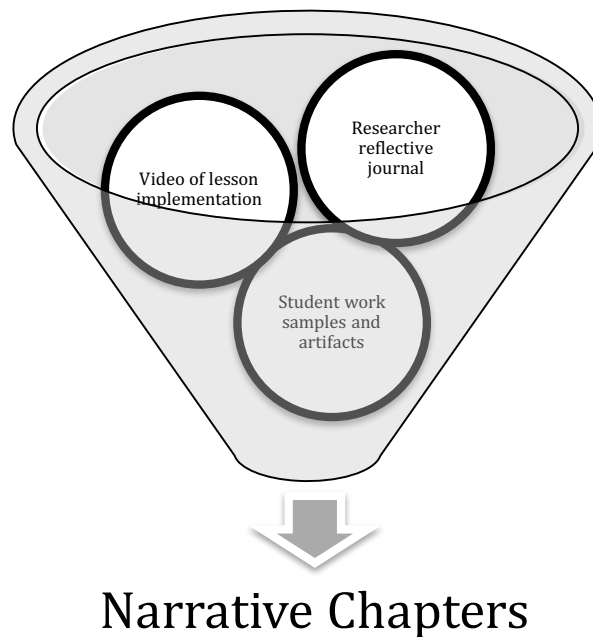


Figure 3: Construction of Narrative

Morrow (2005) voices that research occurring within a critical paradigm be concerned with the particularity, which is echoed in the work of Ellis, Adams and Bochner (2011) and Hughes, Pennington and Makris (2012). This story is told using thick description of my experiences through narrative approaches. This method of analysis and presentation supports readers of my autoethnography in connecting with my work by understanding my lived experiences as a participant in a particular group, in this case early childhood educators engaging in TMfSJ work. The rich descriptions within my researcher journal provided information about

this study that can illustrate its uniqueness and provided my first attempt at writing about the event and my experiences. These entries served as a springboard for later iterations of the experience, presented in narrative prose, to allow the reader to enter the scene; to be present within the lessons and interactions with the children I worked with.

To craft the narrative about my experience, I began first by reading and rereading my reflective journal and planning notes, attempting to return to the moment in which the words were penned, thereby becoming immersed in the data and allow for sense-making around the experience (Adams, Holman Jones & Ellis, 2014). In reading the journal and planning reflections from beginning to end, stopping to think about the experience and the narrative they told and revisiting the text support, I became immersed in the story being presented, insighting emotional recall (Ellis, 2004). While reading I attempted to look for reoccurring phrases and ideas that permeated the pages of my notes, making note of these to weave into the narrative (Adams, Holman Jones & Ellis, 2014) and identify possible points of departure for the critical analysis and questioning of my experience (Denzin & Lincoln, 2005).

Using the video accounts of my teaching to construct the narrative, I was taken back the place and time in which the lessons were implemented. Viewing the videos allowed for me to produce what Ericsson (1986) refers to as narrative vignettes, a:

vivid portrayal of the conduct of an event of everyday life, in which the sights and sounds of what was being said and done are described in the natural sequence of their occurrence in real time (p. 149-150).

As I watched the videos of lesson implementation, I flagged critical moments that I felt were impactful to my experiences in TMfSJ. These critical moments, many time moments that

had also been written about within my reflective journal entries, served to provide the highlights of my experiences during the study and more accurately describe the events, as well as include the conversations within the scene, providing “the reader of being there in the scene.” (Erickson, 1986, p. 150). Watching the video of the lessons allowed me to better engage in Ellis’s (2004) idea of emotion recall, placing myself into the story and remaining close to the overall experience.

Criteria for Quality

Richardson (2000) describes five main criteria for the evaluation of ethnographic studies, including the following: a substantive contribution to the field, aesthetic merit, reflexivity, impact and expression of a reality. Ellis (2000) asks similar questions, centered around the authors ability to convey their experience and learning about oneself to the reader, thereby prompting the reader to learning something about the experience being explored. Furthermore, Ellis calls attention to the development of the story and its characters, how they are able to draw the reader in to the text and help to take away meaning. My responses to Richardson’s evaluative criteria are examined below, however, as as the reader of this piece you are welcome to compose your own evaluation of the forthcoming narrative.

Substantive Contribution: Through the use of a narrative to tell the story of TMfSJ I am chronicling the first-hand experience of a teacher engaged in the work. The challenges I identify and progress I make in my journey are not necessarily unlike that of other researchers doing this work, but they are unique in the sense that this work is being done with young children, and new in the fact that I am the teacher/researcher of the story.

Aesthetic Merit: Denzin (2013) outlines elements of a story that should be considered when writing autoethnographic accounts: people, place, crisis or epiphany, order of events and moral of the story. Each of these ideas is address within my narrative, and outlined in the table below:

Table 3: Denzin’s (2013) Elements of Story

Elements	My Inclusion
People, depicted as characters	Children within my study as characters alongside myself
Scene or place	Classrooms, locations of planning and reflection
Epiphany or crisis	Crisis is evident in the initial lesson when things go awry, and epiphany when I draw upon the work of another researcher to build my lessons.
Temporal order of events	The story is presented as a series of events over the 6-week research, from the first lesson planning, to shifts in my thinking today.
Point or moral to the story which gives meaning	The story illustrates the complex nature of this work, TMfSJ, but presents a story in which children at a young age can be successful in it.

Within the narrative I use these elements, in conjunction with “episodes” in which I take the reader into the lesson along with the sights and sounds which accompany it.

Reflexivity: I acknowledge during chapter one the background and experiences I come into this work with, knowing that it will shape the text I compose. During the research process I used my reflective journal as a space to question my own beliefs around this experiences, using some of these questions as thoughts within the narrative. In addition, these thoughts are woven into the points of departure for future discussion and thoughts following the story of my experience.

Impact: I can only hope that this piece is impactful in the sense that it allows a space for teachers and researchers to begin to consider doing, and writing about doing, this work with young children. I hope that it serves as a catalyst for some to begin to embark on this journey. It certainly has prompted me to continue this work and an exploration into my experiences doing it.

Expression of Reality: During the narratives I embed thoughts as to what was happening in my own head during these moments. These thoughts come from both my reflective notes on the implementation, but also my reviewing of the videotaped lessons. The story presented represents how I recall the experience and the events within the summer school TMfSJ.

Verisimilitude and Trustworthiness

Ellis and Bochner (2004) assert that autoethnographic work helps researchers to provide insight into a culture of group which they are a member. As both the participant and the researcher in this work, I possessed a variation of an “insider” status. Although I was not an employed teacher at the school, I had been immersed in the school culture for the last year in the

capacity of supporting professional development, and working with children informally. This relationship offered many affordances as I worked to collect data, such as knowing the context and children for a period of time, and having access to open, authentic discussion about the school culture.(Dwyer & Buckle, 2009). These affordances offered strength to this work in the sense that I am able to compose a truthful account of my experiences within this particular context. Since I was working with students for the summer semester, late May through July, I began by engaging with children in their classroom spaces, working to access their lived experiences outside of school. As Gonzalez (2009) points out the reason many educators may be hesitant to engage in TMfSJ was because they fear it will expose students to too many issues, thereby giving them a dismal outlook on life. By having an insider status as both educator and researcher, I could better gauge my children's reactions to topics and ensure the discussion is contextually appropriate.

Dwyer and Buckle (2009) remind us that the researcher must be open, honest and authentic in their experiences. This is echoed in as Ellis, Adams and Bochner (2011) note that autoethnographers have a responsibility to provide truthful and authentic accounts of the experience as well as Richardson's (1994) criteria of "coherence, verisimilitude, and interest".

Ethical Considerations

Through the systematic documentation and self-reflection warranted by autoethnography ethical considerations may be addressed. Mockler (2014) states that in order to effectively engage in inquiry one must move beyond celebratory accounts, revealing the hardest parts of teaching. This includes attention to maintaining an ethical protocol, and being transparent with stakeholders about the process. Through my own engagement in keeping my research reflective journal and videos of lessons, I aimed to capture an authentic representation of this journey. This

transparency extends to both the children and their families, who may have their own questions regarding my study and its progression. As I attempted to be transparent with the families of children with whom I was working, I sent a letter to families, teachers and the director which summarized the topic of study as we completed each lesson concept. These letters outlined both our mathematical and social justice goals, and provided resources to extend our conversations into the home or classroom.

To adhere to policies involving research within schools and with young children, I updated my Institutional Review Board (IRB) training (Appendix B), and obtained IRB approval from the university prior to beginning data collection. This approval came on June 21, 2016 (Appendix C). In addition, permission was granted from the school site director and board members. Since I was working with young children, family/guardian permissions were also obtained. Additionally, in order to leverage the children as contributors to their learning, I explained the work to those children whose families provided permission and sought their assent to work with me. Assent was again sought before video recording, work sample or artifact collection to be consistent with Papademas (2009).

Chapter Summary

This chapter served to outline the methods taken while engaged in my study centered around the research question of *What are the experiences of an early childhood educator working towards teaching mathematics for social justice?* Using autoethnography as a methodology I worked with Kindergarten age (four to five-year-old) students to fuse social justice teaching with mathematics content. In doing so, I used a researcher reflective journal, videotaped implementation of lessons and children's' work samples and artifacts as data sources.

These data sources provided information by which I could reflect on the overall experience and construct a narrative account of my journey, which is presented in the following chapter. I used the reflections and video to outline interpretations I gathered from the experience, which are presented in later chapters.

CHAPTER FOUR

PROLOGUE

In the preceding chapters I outlined the rationale for my study, reviewed existing literature centered around reconceptualizing early childhood education and TMfSJ, and provided the methods used to conduct this autoethnographic study. This chapter chronicles my journey in TMfSJ with four to six year olds in a University Lab Preschool over the course of a summer enrichment camp. As is commiserate with autoethnographic methods, this chapter is presented in a narrative form to tell the story of my experiences. Allow the story to transport you into my experiences, so that you may connect with the feelings and emotions I experienced during the summer.

Getting to Know My Children

Frantically I searched through my garage for the supply boxes I had purchased almost a year ago. Sweat beading on my brow from the heat and humidity, which had become normal to me after so many years in Florida, I found a package enclosed in bubble wrap near the bottom of a shopping bag. Tearing through the plastic, I took three from the bag, heading inside to fill each with newly purchased markers, pencils and post it notes.

I felt like a new teacher on the first day of school. Fresh school supplies still in their packaging spread across my living room floor. Organized by color and size, each pile was neatly set, ready to be placed into a supply box and longed to be touched by little hands. It had been so long since I was able to work with a group of four and five year olds focusing on mathematics. The rush of shopping for supplies, preparing lessons and locating manipulatives for the children

to interact, which had put a smile on my faces weeks ago, shifted. My stomach was in knots- a tightly wound ball of nerves that seemed to grow larger with each passing moment. *Could I really do this? Was I capable of doing this work with young children? Do I know enough about them as individuals? Will they even want to participate in this work, or are they just coming because their parents indicated they could on the participation form? Can I do this?* Casting my worries aside I returned to packing the boxes for my upcoming visit. Each one neatly placed into my “teacher bag” I added a folder with paper, copy of my initial lesson plan, a bag of dice, some counting chips, computer and video cameras. I silently convinced myself that I was ready, slipped my bag and materials into the car, and climbed inside.

The door to the school seemed so far away from the location of my parked car, yet I could feel it beckoning me to come inside and begin my journey. My car, filled with a loud echo of music just minutes ago, sat silent. *Why was I so nervous to enter this safe space in which I had been working all year?* Opening the door to the car I grabbed my things and hopped down into the dirt covered lot. Reminding myself I was perfectly capable of doing this, the words of my husband saying “You can do this- you have worked too hard to turn away now” I punched in the access code and entered the school.

Management 101. Dropping my bags in the director’s office, she offered a quick glance and “good luck” before I journeyed into the room which housed the eldest learners for summer camp. Bouncing four and five years olds greeted me as I stepped inside, others breezing past end route to one of the many center areas in the newly arranged classroom. I glanced down at my sticky note to review the names of the children whose parents had consented to working with me, then sought out the two classroom teachers for support.

Eventually locating the children on my list and asking them each if they wanted to “do some math” with me today, we ended up with a small but intimate group of five children sitting in one of the class meeting spaces. We took our moment to make silly faces at my computer and video cameras, since I knew that this behavior was inevitable with the youngsters, and then took some additional time to play with the math tools I had brought that day- neutral colored stones that echoed the naturalistic setting the school aimed for, and some die that contained numbers up to 15.

I had spent time planning our task for the day, a simplistic game in which we would roll the dice and make a set of that many stones. Children would then compare the amount of stones they had with the person sitting next to them to see who had more, who had less, or if they had the same. Not too difficult, but just enough for me to quickly pre-assess the children’s number sense and abilities to count and compare. I knew these areas were ones in which the children would continue to work on during Kindergarten the upcoming fall, so I modified the numbers to only go up to 15 instead of 30 as the standard read.

I felt ready. Directions were given, we did a sample run with myself and one of the boys, let’s get going I thought. Things were going smoothly for the first few minutes, then it all went downhill quickly. Stones were suddenly scattered across the worn down tan carpet. One child was crawling into the dramatic play area, while his partner decided to play the game on the stack of cots adjacent to the kitchen area. I froze. *Was this really happening?* I struggled to get up and redirect everyone back to the carpet, but did. We regrouped and started again, this time my energy focused on working with one little boy who was struggling to identify the numbers on his dice, let alone count out a corresponding set. Stopping to question in my head how I was possibly going to make this work with some children who were clearly bored by my task and

another who had very limited knowledge of number, I saw it. Heads on the floor and the math tools I had brought no longer scattered the carpet but were flying through the air, then falling to the floor in a downpour that put the summer rainstorms we had daily to shame.



Figure 4: Children Working Through Beginning of Preassessment Lesson



Figure 5: Children at the End of Preassessment Lesson

I sat for a moment stunned. *What had gone wrong?* My head racing, heart pounding that I was not cut out for this work after all. *If I cannot get myself together enough to teach a small group of 5, what business do I have teaching teachers?* Hastily, I motioned for the children to come back to our space. Without even attending to our goal for the day, to compare quantities up to 15, I ushered them back to the block, literacy and technology centers. I then returned to our space, gathered up my materials and quickly ascended the steps to the loft work area to write my reflection... and cry.

Perseverance, and a Glimmer of Hope. *Here we go, day two. It cannot be worse than yesterday.* Armed with Legos, play-doh, markers, paper, pencils and an image depicting equal and equity, I entered the building. My group from yesterday, all willing to come back again (although I am not sure why) accompanied me to the kidney shaped table in the literacy center. Then they saw my supplies. Excited shrieks over getting to use play-doh and Legos erupted from our corner of the room as the rest of the class transitioned to outside play. Today would be different though. I was going to set some ground rules and expectations.

After providing some time for the group to explore the tools I had brought in for the day, a trick I discovered as a classroom teacher to help manage the excitement stemming from using new tools, we dove into our discussion centered around equity versus equal. I placed the graphic onto our workspace and asked the group if they had ever been to a baseball game, or seen one.

EQUALITY VERSUS EQUITY



In the first image, it is assumed that everyone will benefit from the same supports. They are being treated equally.



In the second image, individuals are given different supports to make it possible for them to have equal access to the game. They are being treated equitably.



In the third image, all three can see the game without any supports or accommodations because the cause of the inequity was addressed. The systemic barrier has been removed.

Figure 6: Baseball Game Graphic

Although I already knew the response seeing as the baseball field was directly next door to our school and the class frequently could see and hear games occurring, I wanted to get the group excited about the graphic and guide our conversation around the desire to see what was happening at the game. Little did I know that right off the bat the group was going to dive into the issue that one of the children in the image could not see the game.

“I’m going to stand on this one” Leo exclaimed, pointing to the tallest box.

“I’m going to stand on this one” Ronald reiterated. Leo shot him a glance as if to determine if Ronald was coping his thought or not.

“Why are you going to stand on that one?” I inquired.

“So I can see better” Ronald instantly replied, frowning his brow as if to ask why I was so confused. *Okay, they are noticing that the tallest box is the one that will allow an unobstructed view of the game. Now to draw their attention to the height of the children. That shouldn't be too hard...*

Already I felt like this particular interaction was going to be a million times better than our previous one and, after a brief introduction into our task, my thoughts were confirmed. Nobody was rolling around on the floor yet; no Legos had been launched through the air. So far this lesson was a success. We continued to talk about how they would feel in each position on the blocks. All of the group agreed they would want to stand on the top box to see the game since that person must be happy since they can see the game. The group then effortlessly told me they would feel sad if they were unable to view the baseball game, as the middle child had a partially and fully blocked view and the shortest one, a completely obstructed view. They also found the second image in which all three children had the same size box problematic, stating that the smallest child still was unable to view the game without obstruction. My head raced- they were getting it, seeing that giving everyone the same thing was not a good solution either. Could they provide adequate response to what might be a viable solution to the problem they were bearing witness to? I was hopeful.

With the Legos, play-doh, markers and paper reemerging, the group perked up and attended carefully to my next instruction. Careful to use their words, I restated what they had told me about the first two images and presented the basket of materials, inviting them to again touch. “Your goal” I said, “is to show me what you think would be a good solution, a fair solution, so everybody in this picture gets what they need to successfully watch the baseball game.” The words barely escaped my mouth before the children were eagerly reaching for tools. Leo grabbed

the play-doh and began using multiple colors. My obsessive-self cringed as the yellow and green play-doh mixed, but I held back knowing that something amazing would happen if I let that go. Caleb took the Legos and began to construct a tower of sorts. I stopped to watch then turned to Ronald. He had chosen the paper and markers and was making a series of lines and circles.

Pausing for a moment I collected myself and glanced at my plan. I knew I had planned questions to ask them as they were constructing their pieces, but for the life of me I could not remember what they were. I tried to casually grab my lesson plan for the adjacent chair as the corner of my eye caught a rogue Lego flying across the table. *Here we go again* I thought. To my surprise, Leo quickly knelt down, picked it up and returned it to Caleb, then immersed himself in his play-doh pile. *Okay, not a total disaster. Good. Progress.*

Turning my attention now to Leo and his growing mass of yellow-greenish play-doh, I asked him to explain his model and thinking.

“So whose gonna get the bigger box?” I asked tentatively, hoping his answer what be what I was looking for.

“I am going to think...”

“Who needs the biggest box?”, I interrupted, not waiting for Leo to finish his thought.

“That boy” he said, pointing to tallest person.

Interesting. Okay, where is he going with this? The tallest person needs the biggest box? Really? Have you been listening during the beginning of our lesson? Didn't you just tell me that it wasn't fair that the tallest person got the biggest box to stand on? I probed further:

“Oh. So why does he get the biggest box?”

“Cuz, cuz, cuz, cuz he's longer” Leo stammered, never gazing away from this play-doh mass.

“Cuz he’s longer?” I asked, puzzled and trying to recall my knowledge about children’s understanding of proportional reasoning.

“Yea, cuz he’s...” Instantly Caleb came to my rescue; calling to question Leo’s thinking through an interruption that deep down, I welcomed.

“No, she needs a little more boxes I think” Caleb interjected, dropping his Legos and moving towards Leo’s play-doh construction.

“Caleb, so you think this one needs more boxes? Why?”

“I think she needs three more (pointing to shortest person) so she can see, and she needs two more (pointing to middle person) so she can see better.” *Yes, Caleb, that is right! Thank you. Now come on Leo see the connection Caleb made to our earlier conversation. Reflect on his thinking, his use of numbers to make this a little less abstract for you.*

I let the discussion settle in for a moment, checked in on Ronald, who was still representing his thoughts with an entanglement of circles, then revisited Leo and his yellow-green mountain. He shared with me his newest line of thinking, one that revolved around everyone sharing the tallest box in order to see the game.

“So what I hear you saying...” I began, trying to draw from my knowledge of accountable talk.

“No, the giant one (pointing to his constructed play-doh box) is going to be for that one (point to middle person) and that one (pointing to smallest person).” *He is very definitive in his thinking. I wonder why the people are sharing boxes now.*

“So they are going to share that box?” I was searching for any possible idea that would clarify Leo’s thinking about this topic.

“Yea.”

“Hmm, is that going to be fair still? Are they all the same height, so they all need the same size box?” *Come on Leo, we went over this. What are you doing? I am getting frustrated. Don't lose your cool Jen. He has an idea. Let's go with it.*

“Well.....” he paused, returning back to work with his play-doh for a few moments.
“Cuz, cuz, that girl can't see very well.”

“So how can we get it so that they can see too?”

“Well she is gonna climb and get to the top”

“Oh, so can you explain... let me make sure I understand your thinking correctly okay. So the shortest person is going to climb to the top of this box, the highest point. Then the tallest person will be down here, on the shortest point. So where will this person (middle sized) be?”

“She's gonna be with her sister” he claimed, pointing to the tallest box. *Again, the sharing. Is this a byproduct of him having two brothers? And why are the smallest people represented girls in their minds? I need to come back to this idea later.*

“The tallest, the shortest or somewhere in the middle?”

“Right here” he finished, pointing to the top box.

In hindsight, Leo had a perfectly valid way of having the people on the boxes and witnessing the baseball game. I, however, had a set plan in my head of what the children's understanding should be. In the end, all three children, Leo, Ronald and Caleb eloquently determined that everyone needed to get a box that worked for them and their height. This meant that maybe sometimes one person gets a bigger or smaller box. Ultimately giving everyone the same thing was not enough, everyone should get what they needed to see the game.



Figure 7: Children's Constructions from Equality vs. Equity Lesson

I watched silently as the children finished putting touches on their constructions. Proudly, they provided permission for me to snap some quick photos of what they had created before they transitioned from our workspace to outside free play. As I gathered up my belongings the classroom teacher walked by, wiping down the last table for lunch before joining her class outside on the playground. I wasn't sure if I wanted her to ask how it went or not. *I wasn't sure if it even went well or not. It felt better; they got the gist and were not rolling around the table and floor.*

“How'd it go today? They seemed really into it from where I was in the art area. I mean, Ronald looked like he was working hard and Leo was pretty calm. They can be so tough sometimes Jen. I mean, I worry sometimes about Ronald going into Kindergarten next year. Do you think he will be okay?”

I paused, grappling with my response. Part of me recalled the prior lesson, the struggles with number identification still being faced, and wanted to scream out “No”. But another part, a more optimistic part said “Yes. He’ll be alright.” There was a moment during the lesson, when they were all able to discuss the inequity being demonstrated in the photo and work to think about how they might address it. That was promising and reaffirmed my hope. *Content they can be taught and supported through* I thought. *It’s much harder to teach them how to think critically and be fair. They proved they understood that today.*

CHAPTER FIVE

GARDENS, SPLASH PARKS AND PLAYGROUNDS

Following the ways in which the children were able to eloquently discuss equality and equity, I felt empowered in planning the next set of lessons. Having been involved in the planning sessions for the teachers of these children, I knew a focus was on studying the playground and school garden. My desire to connect our first lesson to both took hold, and I began to explore the location of playgrounds and community gardens in our county. Deep down I thought that this could be a great opportunity to merge knowledge I had gained about the community with the pre-existing project the children in the classroom were engaging with.

Ideas and Roadblocks

Armed with a cup of iced coffee to offset the rising summer temperatures, I scoured the internet via the county parks and recreation website during my planning session one Sunday morning, I found the locations of these, as well as splash parks that corresponded with some of the playground locations. It was at that moment that I noticed the discrepancies between what I had found and what I had experienced. As a resident of the area and having worked with a volunteer service organization around community gardening, I knew that there were specific locations of community gardens and splash pads that were not represented on the map I viewed on my computer screen. I tried to refresh my search, but was left with the same results. Beginning to get frustrated, I moved on to using a general google search to locate the information I knew to be true. Unfortunately, this path yielded the same results and I only become increasingly frustrated with the mismatch between what I located and my own

community knowledge. Within my journal I wrote the following bulleted notes about these tensions during planning:

Resources- so many websites that all provide different information. The city lists some sites used in planning for lesson set 1, whereas the county Parks and Rec lists others. I know there are gardens in <various locations> yet these are not listed on either sites. I need to research the community makeup and issues myself to develop my own understanding- simultaneous development of my community knowledge and how to infuse this into lessons.

(Reflective Journal, July 10, 2016).

I had wasted so much time searching the information I could gather online. *Was it going to be this difficult for every lesson I write? What did I get myself into? I can't image others doing this work spend so much time planning right? Does it, or will it get easier once I get into a flow of planning lessons? God I hope so.*

Pushing my chair back from the kitchen table at which I was working I closed my computer, and placed my head down into my arms. *How could this be happening?* I thought. The excitement I felt when beginning to plan subsided and tears welled up into my eyes. If I wasn't even capable to finding information to plan my lessons around, how would I possibly even teach them? As I heard our garage door opening, a sign my family was home from the park, I sobbed at the fact that I had been planning for over two hours already for one lesson and had close to nothing to show for the effort. Here I sat, having missed time with my daughter and husband playing soccer at the park, and still needing to spend more time during our Sunday together planning and scouring for information. I knew these lessons and tasks would be difficult, but I

was certainly not prepared for this. This is when it dawned on me I truly did not know enough about the local community. I silently scolded myself for not engaging in my own community walk, an assignment I used with pre-service teachers, to get to know the local area beyond our school and university.

The Trouble with Counting. After my experience planning the lessons, I remained hesitant to implement them with my learners, but moved forward anyways. I finished crafting the lesson, deciding to focus on children using a map of the area with locations of the items indicated, and then using technology (i.e. iPad, iMovie, video cameras) to create a movie advocating for a splash park, playground or community garden on campus. Armed with maps of the area; each landmark, splash park, community garden and playground indicated by a colored dot, I found my children and moved into our work location.

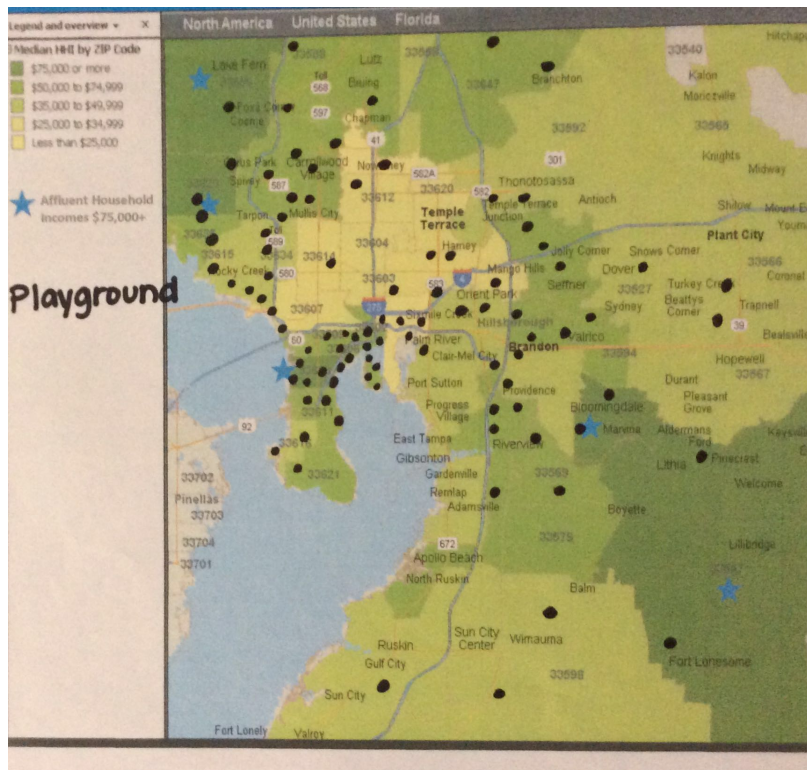


Figure 8: Map of Playgrounds

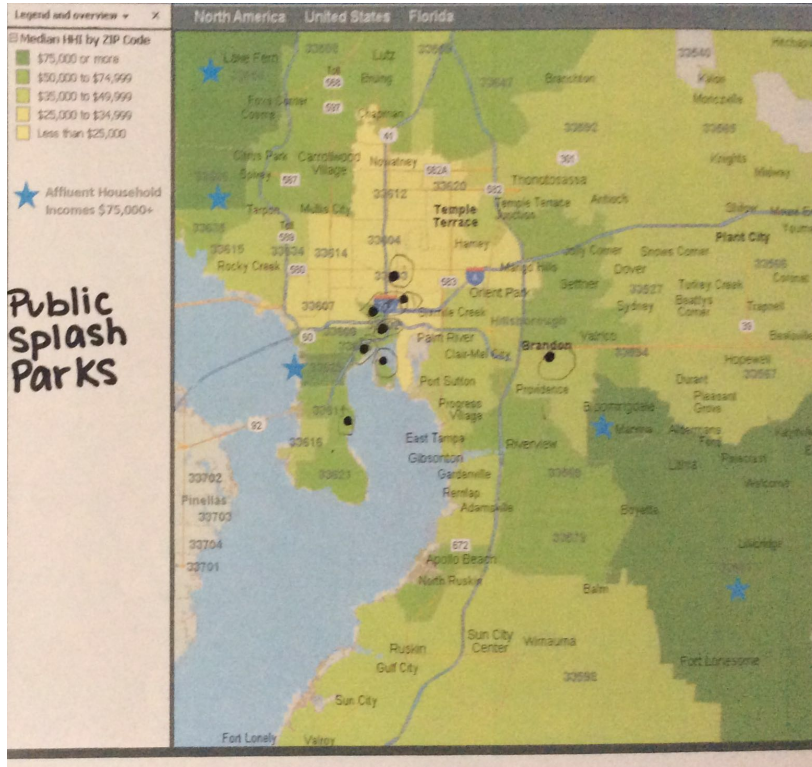


Figure 9: Maps of Splash Parks

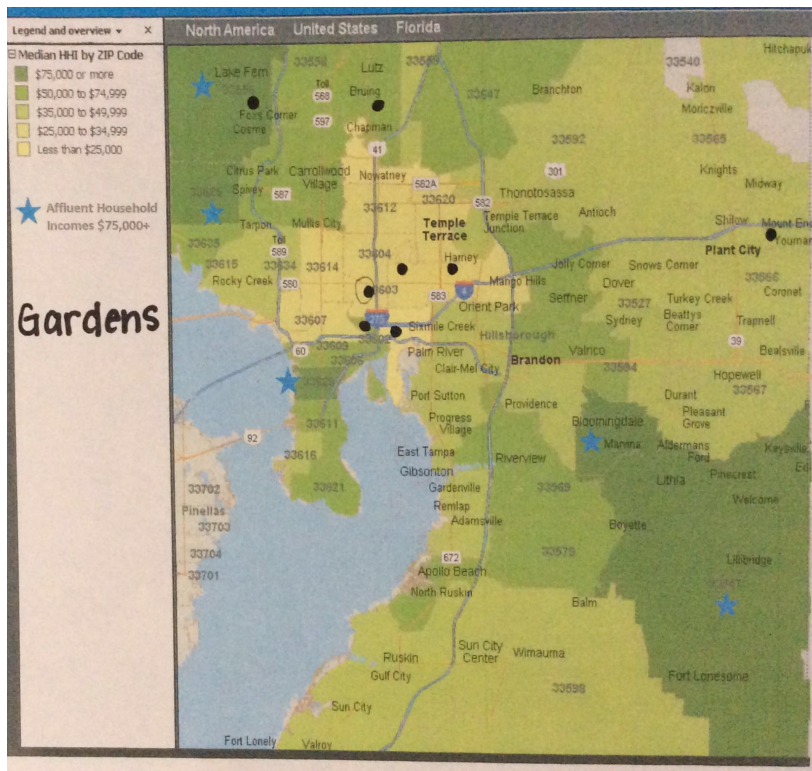


Figure 10: Map of Gardens

Gathered around a rectangular table in a separate part of the classroom, we began to engage in our work without interruption. After a quick recap of our discussion from the time prior and moment exchanging what we had all done over the weekend, the children and I got down to work. Placing the map on the table for us to examine together, I inquired as to if the children knew what I had placed on the table and what it represented. They confirmed it was a map of our area, and I showed children where our school was located on the map. It was then the children became glossy eyed.

“Wow, there are a lot of dots on this paper”, stated Anthony as he witnessed the black dots splattered across the maps like drops of paint on a canvas. As the other children nodded their heads in agreement, I prompted the group to focus in on one map, which represented the playgrounds.

“Let’s look at the blue dots on the map, those where playgrounds are located in our area. What do you notice about them?”

All that I could hear were the shrieks of laughter echoing from the group on the porch and playground as a long, awkward silence filled out room. I hoped someone would mutter that there were only two near our school, neither of which was overly close to campus. I waited...and waited. At this moment I was thankful that wait time was an attribute of teaching I felt comfort in, but soon this comfort vanished and panic set in. *What should I do now? Oh my goodness, they aren’t able to understand the map? The entire lesson stems off being about to see a pattern and interpret this map and the number of playgrounds represented on it. How am I possibly going to recover the rest of the lesson? This is a complete failure, and being captured on video*

nonetheless. After what seemed like an eternity to me, I redirected the children to where we were located and provided another question.

“What do you notice about the number of dots in our area?” I probed, pointing the area which represented the zip code of our school.

“Oh, well there aren’t a lot of them” responded Leo.

Okay, we are getting somewhere, but it doesn't seem like they are seeing this as a problem. I mean, can't they tell that there are hardly any dots here but there are a bunch of dots in other areas? Maybe if we get out the snap cubes, they can make trains to compare the quantities. Yes, that will work. That's a good idea.

Glancing around the room, I located the snap cubes in a clear tube on the back counter. Breathing a sigh of relief, I moved to them, grabbing the bin and turning to return to our work space in one motion. I placed the bin in the middle of our table, and asked the children to make a cube train that represented the amount of blue dots they saw in the area by our school. The children, complying with my request, grabbed the cubes and began to constructing their representations of how many playgrounds were in our area. As they were constructing, I began to ask each one how many they had counted within the area. Answers varied and I quickly realized I needed to re-think this lesson. There were simply too many dots to follow. I thanked the children for working with me, telling them we would pick up our lesson tomorrow.

Rethinking the Lesson. After packing up my materials for the day, I sank into a chair in the loft area of our school. *Why is this lesson so problematic? I know mathematics, I can see that there are more playgrounds in the more affluent areas of the community. How can I support the children in seeing this and problematizing it?*

Reviewing the video of my lesson, I could not get passed the overwhelming feeling that children had when looking on the map. I thought I had carefully planned the number of dots to be less than 30, which is what was signified in their standards, but in looking at all the dots represented at once, was a lot to take in. I began to brainstorm how I might break the lesson down for children so that it was not so much to take in. In doing so I thought back to the main purpose of the lesson; I wanted children to see the difference between the number of each within the most affluent areas in our community and our own school area (which is one of the lowest). *I know this is information I need to convey to them- which areas are more affluent and which ones are not. How though? Should I just openly share that information? Should I ask the children to share what they know about the three areas? Would they have knowledge about that? Could I find some information to share with them and ask them to draw these conclusions? What modification can I make to my questions to help them connect to fairness in this lesson?* I decided to simply tell the children about the SES of each location. We could then use this knowledge to advocate for playgrounds, splash parks and gardens in our area, even on campus perhaps. The question remained however, how do I help the students see this connection? The map idea was too busy and much too abstract.

Glancing at the clock I noticed the time. I needed to leave to get my own child from school, feed her, finish homework and prepare for the next day of our lesson. I grabbed my bags and flung them onto my shoulder. They seemed heavier today. Hanging my head, I trudged down the stairs, exited the building and climbed in the car. Once inside, my eyes welled up, tears trickling down my face and landing on my steering wheel and sliding onto the seat of my car. I felt so disconnected from the children. I hadn't built the relationships I needed to be successful. This was evident by how off the lesson was today. *Did I really know them? I had been at the*

school, but did I know the children? Did they know that I cared about them and wanted them to be successful? Did they know that I truly believe they can be successful in the lesson, but it might take time? How could I convey that I care about them?

This work is so difficult to start with and then coupling it with these children not being children who have worked with me for an extended duration of time (just summer) makes things more difficult. Sometimes I wonder if there would be a difference if this was “my classroom” and “my children”. *(Reflective Journal Entry, July 14, 2016)*

Driving down the highway it dawned on me; why not focus in on just our zip code and one or two others? This would help limit the number of dots present on the map children were interacting with, and hopefully support their success. By the time I had reached my daughter’s school, a mere 25-minute drive, it was decided. I would rewrite the lesson that night with the modification brainstormed and implement the lesson the following day.

<p><u>*Building Understanding (Whole Group Exploration-Core):</u></p> <p>examine graph of number of each item by zip code- generate alternative representations using numbers/ tools/ dot stickers have students engage in comparing</p> <p style="text-align: center;">(STOP DAY 1 Here)</p> <p><u>Unpacking social justice issues:</u></p> <p>examine map of average income for Tampa bay overlay clear sheet that shows where the locations are of the parks/ gardens splash areas as a whole within bay.</p> <ul style="list-style-type: none"> • Explore the frequency in each color (light to dark) • Create a new table in which we compare the number of each in each color section (light to dark) 	<p><u>Pair/Share HOT Questions:</u></p> <p>Which zip code has the most of each? The fewest?</p> <p>What do you notice about the colors on this map- what do they represent?</p> <p>(after data interpret/generate) which colors had more/ fewer of each?</p>
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Figure 11: First Iteration of Lesson Plan

<p><u>*Building Understanding (Whole Group Exploration-Core):</u></p>	<p><u>Pair/Share HOT Questions:</u></p>
<p>examine graph of number of each item by color area (dark, medium, light green and yellow)- count the number and represent with connecting tiles. Create graph using stickers to represent data (repeat for splash parks and gardens only) have students engage in comparing data obtained.</p>	<p>Which color has the most of each? The fewest?</p>
<p>Day 2</p>	<p>Does this seem fair to you? Which color would you want to live in?</p>
<p>Show map of playgrounds in area and generate graph of play grounds according to high income (green) vs. low income (yellow) and compare to area for PCL.</p>	<p>Do you think children live in all these areas? Do children like going to playgrounds?</p>
<ul style="list-style-type: none"> • Unpack questions • Problematize higher income having more (also have some not public in their neighborhood so number is most likely larger). • Engage in creation of digital story, video, recording that explains the data in the graph and discusses why having no playgrounds near PCL is not fair. 	<p>How many are in the richest areas? Poorest? PCL area?</p>
<p>Connect lack of playgrounds to issues with lack of physical activity / obesity, lack of organized sports teams/ building social skills.</p>	<p>Is this fair? Does these need to be a playground in our area (why or why not?)</p>
	<p>What happens if there are no playgrounds in our area?</p>

Figure 12: Modified Lesson Plan

I Think They’ve Got It. Half-heartedly I emerged from my car the following day and trekked up to the doors of the preschool. Sometime between the time I sat down to edit my lesson the night before and the time I got out of my car at the preschool, I had convinced myself that this re-write was going to be a do or die situation. If the children still struggled, I wasn't sure what I would do. I wanted to make sure I was keeping my high expectations but still addressing them where they were. I wanted to make sure that the social justice theme was still in the lessons. Balancing the two continued to feel difficult, although days prior I thought I had a handle on things. Now, I was not so sure.

As I entered the large classroom and quickly scanned the children within various areas, I initially noticed only two of them were in attendance that morning. *Well, at least I won't expose too many children to this lesson if it goes horribly wrong.* It was then I saw the remaining children hovering near the sink waiting to wash their hands following breakfast. Calling the children over, we took up residence in our usual location. I had decided to start with the splash parks and garden maps as a tool to examine first, since there were not as many dots to work with.

This way I can focus on the counting and graphing aspect, the mathematics component, and maybe they can notice the difference in quantities across areas.

“Oh, the maps again. But there, there aren’t as many dots.” Based on Natalie’s statement I could tell that this was a good a reaction.

“Yeah, I changed them a bit. What do you notice about these? Are they a little easier to read?” The group nodded in agreement.

“Okay, so here is what I want us to do today. We are going to count the dots on the map for the gardens, and then use these stickers to make out own graphs. Now on the maps there are different colored areas: dark green, medium green, light green and yellow. We are going to count the dots in each color, then make the graph, okay?” *Wow, I sound like I have no clue what I am doing. Can they tell?*

“I made a graph before about color. Like we made with Ms. Elizabeth right?” I was glad to see Andrew connecting back to a lesson his teacher had done with him a month or so ago. Hopefully the other students could recall graphing as well.

Working with the garden and splash parks graphs, the students counted the circles on the map one color at a time, using dot stickers to construct a pictograph that corresponded with the information shown. *Alright, things are going well. Everyone is working well together. The graphs are looking great. I think we can move onto looking at the playgrounds in a different way. I think they are ready. We can do this.*

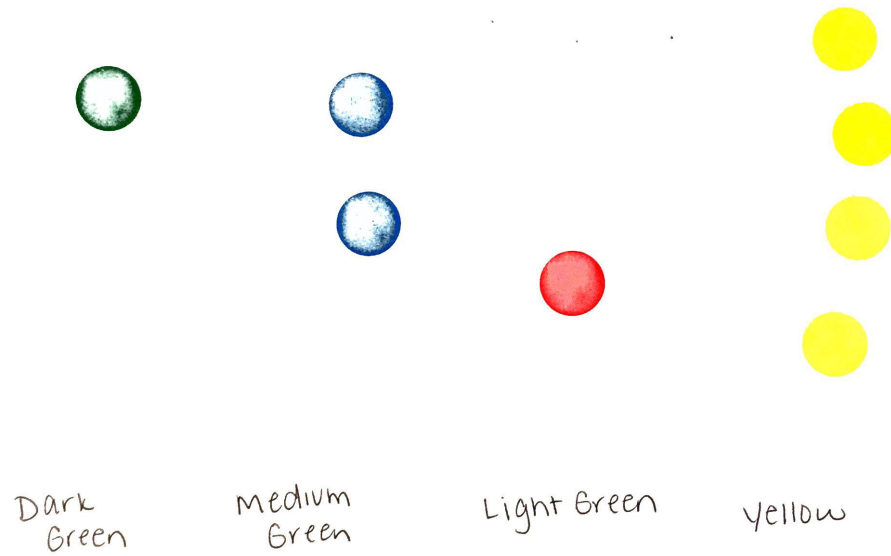


Figure 13: Garden Graph by Natalie

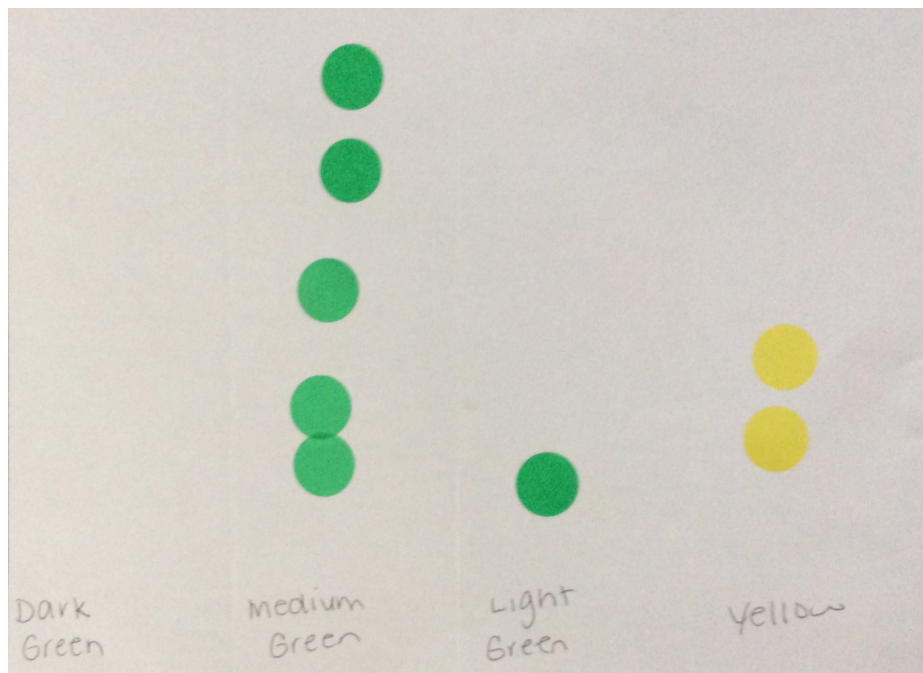


Figure 14: Splash Park Graph by Leo

Once done, I asked the children to make comparisons between the columns on their graphs, noting which colors had more than, less than or the same amount of dots as others. *Okay, now to weave in the socio-economic piece. How much time do we have left?* I glanced at the

clock as the door to the playground wiggled open. We had been at this for almost an hour. The expressions on my children's faces showed it was time to wrap it up for the day.

“You guys did a great job. We are going to wrap up our lesson for today, since it is getting close to your lunch. Tomorrow we'll look at the playgrounds again, but I'll make it easier.” My mind raced with ideas. *Clearly they can read a graph. I had forgotten they had worked on graphs this year. What if I showed the data in a graph and they can interpret it?*

A Video Plea. As I began to think about how I might have the children take action against the lack of public play space within their community, I noticed that some of the children I was working with were particularly interested in the technology space housed in one classroom. Searching for a way I might bring in technology for them to use, I decided to have children construct a video in which they talked about what they had learned in our series of lessons, connecting this to the need for a public playground somewhere on campus

This idea came largely from my own selfishness wanting to integrate technology into our work. True, the children were using technology in their centers via the interactive white board and tables, but this was mostly just playing games. They certainly had not begged to use it in any way, but I wanted to try it, no I *needed* to try it! Not just using technology, but using it to construct something. After learning so much new information during my doctoral coursework, I wanted to put some of it into practice. As much as I wanted these children to take action, I felt a burning desire that I could do anything that I had read about in courses; I guess that was the competitive nature in me.

Armed with video cameras, iPad and my usual materials I entered the classroom we worked in. The night before I had taken the playground data and created a bar graph that represented the number of playgrounds in our school's zip code, a more affluent zip code and a

zip code with similar socio-economic status in another area of the county. *I can't believe there are no public playgrounds in our area. All the children of students on campus and not a public play area for them? Can't they build one on campus? I imagine it would be widely used by people here, even community members.* As I sat down with my group I was curious what they would gather from the graphs and how the construction of the video would go. We exchanged pleasantries, then got right down to work.

“So I made this graph for you. When we look at our graph we want to see how high the bar goes and that corresponds with a number on this side, called the axis. Now if I draw an imaginary line of over, this tells me there are five parks in this zip code. Now look at this one. Is there a bar there at all? What number do you think that represents?”

“I know” stated Leo adamantly. Moments passed and still no response. *Okay.... Are you going to elaborate on this?* “Well, there is this one. There should be one there. I think that you just forgot to put one there.”

“I agree that there should be a bar there. What number does that represent if there is no bar, there is nothing of something? What number could we represent?”

“100!” called Leo. Ronald echoed his idea and Anthony chuckled at the other boys becoming so animated. *Really. 100. Come on. They aren't even understanding the concept of zero? What in the world happened in math all year long? They should at least know a representation of zero.*

“Okay. We will skip that one for now and come back to it. Let's look at this one. Is this one taller or shorter than our first one?”

“Well it might be taller or larger. Let me count.” Ronald began counting, arriving at the number 12. “It's 12.”

“What is the larger number, 5 or 12? How about we use your measuring tapes to see.” I wanted to connect the measuring tapes the group had brought to our meeting to a number line, a math tool I knew they needed to have practice with as they moved into more advanced number concepts.

I supported the group in locating 12 on the measuring tape, then looking to see where 5 was located. Natalie and Liz quickly determined that 12 was the greater number. Andrew drew attention to the 0 on the measuring tape, noting that this number was less than both 5 and 12.

“This is 12. This represents the number of playgrounds in areas where they have a lot of money. This number 0, this is the number at the area the preschool is in. What do you think about that?”

“It’s good” replied Ronald, spinning around, hopping on one foot.

“You think it’s *good*?” I questioned, confused and trying to hide my discomfort.

“I think there is one for the big kids and the babies” responded Leo. *Now I understand. I need to clarify that these are public playgrounds. They are only relating to the one they go on every day.*

It took more prompting to move the children beyond thinking about the playground they visited each day. The majority of them began discussing the playgrounds they had been to, either with their families, sitters or to attend the extra-curricular events of siblings. I had to think quickly about how I could clarify that we were looking at public playgrounds.

“Can you visit the playground at school whenever you want? Can you visit the playground at school on the weekend?” This question prompted a chorus of “No” from the group. *Now we are getting somewhere.*

“So wait, there aren’t any playgrounds near school for us to go to on the weekends? But there are a lot in this bar” stated Anthony pointing to the bar representing 12. “That doesn't seem fair to me.”

Yes. Thank you Anthony. I agree, it's not fair. Calming I took a deep breath and reaffirmed to myself that it was a good time to introduce the task of making a movie to convince others that there should be an open access playground on campus. I explained to the students that they could use the iPad, laptop and video camera to create a movie persuading people at our university to build a playground on campus. I told them that they would be doing the filming and talking, but that I would help with asking questions to guide the video. Unfortunately, the video production did not end up going entirely as planned and we spent much of the time continuing to dialogue about the idea that our school playground was not open on the weekends and therefore could not be used.

“So Leo there were zero of what?”

“Zero playgrounds. And there were zero and there should be 100 and ten at this preschool.”

“Oh, so there should be 110? Why is that important? Do you guys like to play?”

“Yes.”

“Do you think that, now we noticed that there were 12 playgrounds in the area that made more money. Is that fair?”

“Well let me measure.” *Ugh Leo and that measuring tape. Geez....Okay, do your measuring. I can edit that part out I guess.*

“So what do you think is that fair or no?” I continued to prompt, ignoring the fact that some of the children were now becoming distracted, a key sign that I needed to either work harder to engage them or cut my lesson.

“Well there are two playgrounds at this preschool.”

“I think there are three.” Ronald interjected.

“What happens when the preschool is closed? Can you play on those playgrounds on the weekends?”

“I don't really want to do this anymore.” Ronald spoke candidly to me as he held the camera recording the conversation Leo and I were having. I glanced at the other groups. Natalie and Lily appeared to be done also. Neither was recording, but instead playing with each other's hair. Andrew and Anthony had moved to the block center and were engaged in building a replica of an Italian tower. *It's done Jen. Don't beat a dead horse. Let them go. You made a valiant effort, but know when to quit. You can always revisit this tomorrow. Hopefully it will be met with more success.*

New Plans

Reviewing the videos from my first lesson I grimaced. The raindrops echoing on the roof of my patio strongly simulated the tears I had shed during while teaching and planning this initial concept. Time after time I found myself shaking my head and thinking about what my teacher educator self would say about my lesson. *Let's talk about the length of the lesson. It was over an hour. Do you think that may have contributed to some of the behavior issues that arose? How do you think the length impacted the conversations the children were having in the classroom? What do you feel the children took away from this lesson?*

My reflective journal entries yielded similar embarrassments. In reading and re-reading the words I penned following lessons, I was shocked at the language I was using to talk about my children. Entry after entry focused on what the children in the group were apparently struggling with. At almost no point did I mention something that went well in my study or a highlight of something my children did really well. *What a downer I am*, I thought. *This is both sad and so embarrassing. I am supposed to be doing this study to help highlight the capabilities of young children and move away from deficit discourse. Here I am putting them down and questioning their abilities to do everything mathematical. Was this normal? Is it part of the process? If I am resorting back to this and becoming so frustrated, what might others do? What about my pre-service teachers who may not have strong content knowledge for preparing and facilitating lessons? What might their language look like?*

There had to be a better way of doing things. I wasn't sure I would survive this process without a better way. But who could I turn to? What changes could I make to do things differently. I thought back to an incredible opportunity I had the following Fall meeting other mathematics methods instructors. One had done some work around teaching math for social justice with early childhood. I removed the blanket surrounding me and made my way to our home office. Entering the room, I frantically opened the cabinet where I housed an old conference badge holder filled with business cards of those scholars I had met at conference. Flipping through the pile I located his card. *Teddy*. I thought. *I remember Rochelle mentioned him and he was so kind to share some of his work. I'm sure he has something out there I could look at. Something that he has been successful using to do this with young learners.*

Entering the name into google, a number of hits emerged. Not wanting to waste any more time than needed, I found a link to slides from a conference presentation on social justice he had

made public. Fingers crossed, I clicked the link. His face shown on the screen, like a sign that things were going to be okay. I took a moment and skimmed through the slides, but stopped when I approached one in particular. The content of this one slide was what I needed, what I was looking for. Beginning to read word for word. I was quickly educated in the approach he used to address issue in the news; the killing of a black male by police officers at a traffic stop.

Yes, okay, I think this is what I am looking for. What did he do? What does he recommend? Part of this work is building off the work of other right? Gosh I hope this helps. I am not sure what else to do. So much is riding on this. I need to get this right. It needs to be effective. I need to make a difference. Just me? No, them too. We all need this- a new way of thinking and engaging with the content and its connection to social justice issues. I have seen so much potential in this group of children. I cannot waste this opportunity to connect with them and work with them to unpack what is happening in the world. They have proved their capabilities in talking about injustice and engaging in mathematics. It would be an injustice to not find a better way to work with them. It would be an injustice to not continue this work, showing others the potentiality of young children.

I clicked through the slides on the screen, each one a beacon of light illuminating the pathway towards another way of TMfSJ. Finally, the words I had been searching for, but did not know I know needed emerged. Games. Simulations. It all made sense now. *Have the children engage in a mathematics game that seeks to simulate the social justice issue. That's it. I can lay the foundation for the issue-present that in some way so that the children can work to conceptualize the issue semi-concretely. Then, we can use a game with mathematics content as the base to move towards a more abstract understanding.*

Now that I had a plan, the next step was to think about what we should talk about as an issue next. *I know I want to focus on something the children can relate to. In the first lesson series I was able to build off the project they were working on in the classroom, the playground, but for this one... I am just not sure. I wanted them to have a voice in the project, but the time. Time is so limited. I can't even imagine trying to do this along with planning for every other subject. I am extremely fortunate that I can focus all my attention on planning for the math lessons, but I still feel like I am not able to do that well.*

I continued to grapple with what to teach next for a few days, then it came to me. I recalled when I had joined a local service organization in our area. One of the things we did as a volunteers was work with local school sites and after school programs supporting children in making healthy food choices. Through that experience I had learned something about food insecurity and food deserts within our local community. One I had volunteered at was just a stone's throw away from the school itself. I was curious if the children would be able to connect with the idea of child hunger. *Each day they ate lunch at school- did they know that for some children that was the only meal they might consume? Would they feel a need to take action if the social justice issue was related to children just like them? I think I could create some sort of game that allowed them to experience "hunger" in a way they could understand.*

CHAPTER SIX

CHILD HUNGER

Back when I was teaching Kindergarten I had the opportunity to attend some professional development with a mathematics educator who was brought into our mathematics coach meetings. She first exposed me to the idea of subitizing, or recognizing quick dot representations of numbers, like those on dice. I liked the idea of focusing on this instant recognition piece within our game, using either one dice or two die to allow children to both subitize and count as they were playing. This idea served as the driving force behind the mathematics I wanted to focus on. I anticipated that the children would grasp this idea fairly quickly but wanted to really emphasize the social justice issues- child hunger- in the beginning of the lesson. *How though? How can I make this relatable? How can I show the children what it looks like in a more concrete way?*

I continued to ponder how I might make the issue visible for the children when I happened to stumble across some people counters I had packed in my giant teacher tub of mathematics manipulatives. I pulled the bag out of the top of the tub, looking at the green, yellow, red and blue people in assorted sizes. *I could use these. These could help to present the one out of five ratio.* I took one yellow person and four green from the bag and linked them together. *I think this will work. This might just be the concrete representation I need.* I decided that the children would be introduced to this representation and talk about child hunger in our region. We would then pull a dot card to work on the math component of subitizing. In order to connect the ideas, children would have cups of manipulatives in front of them. I would use the

one in five ratio so that if children pulled certain numbers, they would not get to put anything in their cup. For example, if children pulled a one, six or eleven they would not get to add any manipulatives into their cup, therefore simulating the idea of not eating. For all other numbers, two through five, seven through ten and twelve through fifteen, they could add to their cup. I wanted the children to talk about how they felt when others got to fill up their cups and they did not. *I think this might work. They can try to fill up their cups through the game/ simulated experience, but we can also talk about the idea of fairness as we are playing.*

Introducing Our Game

Maybe it was the side effects of finally getting a full night of sleep, but I entered the school Monday morning feeling ready to take on the world. For the first time since I began this journey I felt prepared to talk with the children about social justice issues. I felt like I had a lesson that had the potential to go somewhere, to engage them in mathematical thinking *and* social justice dialogue. *Games. Why hadn't I thought of this before? All the time I spent making and designing mathematics games as a classroom teacher and I completely forgot about it all when it came to these lessons?* I was still somewhat resenting myself for not thinking of this idea sooner, but today was a new day. A new concept being taught.

Getting settled in our usually location the children circled around myself and people counters I had strategically laid on the carpet; the yellow isolated and the four green connected to one another, but not yet to the yellow.

“Can we count the number of green people? Who thinks they can count them for me? You do, Andrew. Okay, count nice and loud for me. You ready?”

“One, two three, four...” The group joined in as Andrew reached two. Natalie and Andrea continued to go onto five, before stopping mid word, realizing there were only four present and giggling at their error

“What’s the yellow one?” Anthony was trying to move our discussion along, noticing the yellow one off to the side.

“How many green people do we have?”

“Four,” the group responded chorally, shouting with excitement.

“Okay, how many yellow people?”

“One.”

“Okay, we are going to put them together and see how many we have now.”

Anthony sprang forward to touch each person as he counted aloud. “Five, that means there are five. One, two, three, four, five.”

“Andrew, move back I can’t see” Andrea prompted. Her frustration with Andrew was not new, but I was proud she was learning to use her voice to allow her space to show her mathematics thinking. Anthony did have a way of dominating the lessons at times.

“Okay, Anthony thinks there are five; that one plus four equals. Do we agree or disagree? Let’s count them all to see if he is right.” The group began counting, arriving at five and determining that Anthony was correct in his thinking.

“So here is what I want you guys to know about these five people. Last time we were together, we looked at maps of our community.”

“And that’s where we live!”

“Right, that's where we live. In our community, out of every five people one person doesn't have enough food to eat.”

“Why?” Andrea sat looking at me, mouth open in shock. *Good question Andrea.*

“So that means that... that...” Anthony was working to collecting his ideas and get them out. His hands motioning to the manipulative people in front of us, but his words struggling to catch up.

“So that means that...” I began, attempting to finish my thought, and maybe his.

“So instead of that, the people that don't have enough food can, the people who have enough food give the other people that don't have enough food...”

“Yeah” interjected Andrew.

“Sometimes that happens, but not all the time. So these people...”

“That means if it doesn't happen all the time...” Anthony was becoming very animated during this exchange and clearly had a lot of ideas to present to the group on this topic. He was now seated on his knees, waving his arms wildly in front from Natalie and Andrea who were seated beside him. Liz glanced in his direction, her eyes widened and she scooted closer to me, as if scared by his motions. Natalie attempted to jump in.

“Maybe then...” She was shortly cut off by an arm flying across the space in front of her. Instinctively, she put up her own arm to block Anthony and attempted to continue her thought.

“Ms. Jen, maybe...” Anthony's voice grew louder.

“Natalie, let's have Anthony finish and then you can share.” *Oh geeze, why did I dismiss her when she hardly talks?*

“That means that it doesn't have all enough. It means that if they can't go, if they wanted food, if they want all, the ones that don't have enough if they want more they can just go to the store and buy some.”

“Ms. Jen.” Now Andrea was vying for attention.

“Well, sometime the people don't have enough money to go to the store and buy food.”

“Yea but...”

“Hold on. Natalie, what were you going to say?”

“Can I talk after Natalie?”

“Yes Andrea. Natalie, what were you going to say?”

“Maybe someone can eat with the people.” *Wait, what? Am I understanding her words correctly? Is she trying to think about sharing food? Where is this thought process going?*

“Andrea, what were you going to say?”

“Ms. Jen, what about if the other, if this yellow people doesn't have enough food, if we ask one of these people, and one of this people, and one of this people, and one of this people to give them money.” She pointed to each green figure as the words escaped her mouth.

“So Andrea what I hear you saying is that if the yellow person doesn't have enough food there should be a way for the green people to give them money. Or could the green people give them yellow person some food if they have extra?”

“No. But, but, but” Anthony was up on his knees ready to go again. “Someone that has something you can't ask them for anything else. My dad says that. So you can't do that.” *Oh shit-proceed with caution here Jen. How much do I push this? I think that you should help out others, especially in this situation, but it seems as Anthony's family has other ideas. Or maybe other perceptions? I wonder why they feel this way? Does Anthony agree? Is this conversation going to go home? Am I going to be in trouble, get reprimanded for talking about this. How can I cautiously unpacking more of this topic and the children's thinking without overstepping?*

“Alright, let me introduce our game.” Quickly, I diverted from the impending conversation, launching the learners into our game so they could more closely examine the mathematics at play.

I passed out the materials to each children and reviewed what we would be doing. Since I had walked out of the house without my number cards, we substituted numeral dice instead, using the numbers one through five for some, and one through twelve for others depending on the standards they were working towards. If children rolled a six or twelve, they were asked to re-roll. After one minute of free exploration time with the manipulatives and dice, we began to play. Each child rolled their dice, then, as instructed, placed their hands on their head. Moving around the circle of children, they shared the number they rolled out loud for all to hear. Liz, unfortunately, was the first to roll a one, and therefore not put anything in her cup. Everyone else placed something into their cups.

“So if you put something in your cup, you got to eat breakfast.” I motioned with air quotes at eat breakfast for effect.

“Liz, you did not get to eat breakfast.” All eyes were now on Liz. Her smile began to fade. Natalie and Andrew looked at her with sympathetic eyes, as if to say sorry. “How did that make you feel?” Liz just sat and looked at her cup. *Okay, maybe more iterations, to get the point.*

The children rolled again. This time Andrew and Natalie were unable to add to their cups. We continued on this way for seven more rounds, moving through three hypothetical days. At some point or another, each child in the group had a time when they were not able to eat a meal. Liz, by far had the most, being unable to eat five out of nine times. After regaining the children’s attention, we began to talk about how Liz might be feeling in our simulation.

“So we rolled and we got to see who got to have breakfast, lunch and dinner. Liz you did not get to have breakfast, lunch or dinner at some points. How did that make you feel?” Liz shook and lowered her head. Her nonverbal demonstrated she was not up to this conversation right now. I turned to the rest of the group. “So how would you guys feel if this was you?”

“I had breakfast.”

“I know you did. You were very lucky. Natalie, you said you’d feel sad?” She shook her head no. “You wouldn’t feel sad if you didn’t eat?” Head shake again. *Oh goodness, clearly this is not concrete enough.*

“So we are talking about how would we feel if we were one of those people and we couldn’t eat?”

“We would be sad because we would be hungry.” *Anthony is on it today. Pull more out of him. Well, maybe not too much given the earlier comment.*

“Tell me more. How would you feel if you go to eat food, but your friends didn’t? Andrea?”

“Maybe, what about, what about if, um if I share some snacks or not?”

“So you are saying you might share snacks with friends who don’t have any?” *I loved how they were jumping into trying to solve the problem. I wish I could bring more of the children into the conversation.* “Do you guys think we all need food to be strong and grow healthy?” A resounding “yes” echoed in the room. “Is it good that some people don’t have food to eat, or is that a problem?”

“NOOOOOOOOOO!”

“It’s a problem” rang Andreas voice from the circle, her eyes fixated on me.

I could tell they were getting there. They are still engaged in the conversation. Stop here, leave them intrigued and hanging a bit. Come back to this idea tomorrow. My brain was working overtime at this point. This group we so set on finding a solution to the problem. Right away they went to trying to understand what they could do to help. I think this lesson might just successful yet. Now how do I keep the momentum going?

Later that day I penned in my journal an account of the lesson, noting its apparent success. I wrote:

Today I used the game approach to discuss food access with the students on both classrooms. This approach made a huge difference and I can say that I think I felt much more comfortable in the implementation of the lessons. Both groups were eager to attend our meetings today with the draw of being able to play a math “game”. Leo even came looking for me to engage on our work, which gave me an indication that he is at least enjoying the math component. *(Reflective Journal Entry, July 18, 2016)*

For one of the first times during my work on these lessons I felt as if something had finally gone as planned. It was a feeling of not just happiness, but fulfillment. Finally, my vision of what *could be* with these lessons and our discussions was seeming to become a reality.

But I Want Some Goldfish. Building off the ending conversation from the previous day, I gathered my children up the next morning when they came in from the playground. After a quick review of our game, I told the children we were going to play again (thankfully this resulted in a shouts of excitement), but today instead of using counters we would be using some snacks. Their eyes brightened when I pulled bags of colored goldfish snacks from my black bag,

explaining that these would be our counters today. Quickly, I distributed the dice, empty cups and cups of goldfish, using this time to have the children provide a quick recap of the game from yesterday.

“Alright, get your dice ready and get your cups ready.” The children began shaking their cups vigorously, a clacking noise from the dice hitting the plastic echoing in our classroom.

“Ready, set, roll!” The children turned their cups upside down, dice spilling out onto the plush tan carpet silently. “And hands on head”, the cue was given so that the children could remember to not instantly pick up their dice and therefore make modification to their numbers. “Leo, let’s start with you- what did you roll?”

“Six.”

“Caleb?”

“Twelve.”

“What number did you land on Ronald?”

“Um... three.”

“What number did you land on Oscar?”

“Six.”

We continued around our circle until all the children had shared.

“So friends, you get a goldfish, and you get a goldfish” I said, dropping a goldfish in both the cups of Caleb and Ronald. Leo and Oscar looked at their empty cups and sighed, picking up their dice to roll again.

“Alright, dice up.”

“Roll, roll, roll roll” Leo repeatedly as he shook and spilled his dice, anxiously awaiting to see if the number he rolled permitted some goldfish to enter his cup

“I got this number” yelled Ronald from the other side of the circle.

“Alright friends, let’s start with Caleb and see who gets goldfish. Oh, I see Caleb gets a goldfish.”

“Woohoo” shouted Caleb, as he thrust his outstretched arms into his body in one fluid motion.

“Okay Ronald, what about you? What number is that?”

“Five. I got a five.”

“Ronald, you get a goldfish.”

“Woohoo, I get another goldfish.” Ronald smiled, he and Caleb exchanging high fives with one another in celebration of their accomplishment.

“Alright Oscar, what about you?”

“Six, a six.”

“Uh-oh Oscar. You don't get a goldfish again.” I pulled the bag, which was open and sitting in front of him, back towards me. His smile faded, as did that of both Ronald and Oscar who were still celebrating.

“Oh, that’s sad Oscar” Said Caleb, his head tilted and smile gone from his lips.

“Aww, Oscar never gets a goldfish,” said Ronald, getting up and patting his friend on the back to show concern.

“Let’s talk about that. Ronald, I noticed you said ‘Aww, Oscar never gets a goldfish’. Oscar, how are you feeling that you never got a goldfish?”

“Mad” he mumbled.

“Mad? Is it fair that some friends have three goldfish and you only have one goldfish?”

“Mmm hmm.”

“That’s fair?” I wanted to question him. He is surely not acting like its fair with his head down resting in his cupped hands, failing to make eye contact with the rest of the group. I want to unpack his feelings more; the idea that because of a roll and some rules I set forth, he is not able to get goldfish although he wants some (and maybe would argue needs them as it is mid-morning and close to snack time). I waited for a few moments, but there was no response from Oscar. The other children had already moved on, picking up their dice and continuing to roll again. *Alright, I guess we will come back to this idea in a bit.*

Keeping with the game, we returned to rolling and either getting, or failing to get goldfish. The children beginning to distance themselves from me, rolling on their own, then identifying the number obtained. As they called out the numbers on their dice, I would let them know if they could get a goldfish.

“I got ten!”

“I got a three!”

“I got six!”

“Goldfish for ten, goldfish for three, no goldfish for six.”

“Aww man,” said Andrew, hastily picking up his dice and rolling again.

Andrea was the next to have several instances in which she did not get any goldfish. Still wanting to unpack the idea of it not being fair and the children communicating their disappointment, I was ready to bring up the idea again when the office manager entered the room.

“I just got a weather alert for lightning...”

I know where this is going. We need to move. Lesson interrupted; time to be flexible.

“So the kids outside need to come in here, right? No worries, we can head to another room.”

I gathered everyone’s attention, asking them to grab their cups of goldfish and dice and follow me to another location within the school. I grabbed my own materials, and ushered the children out of the classroom door as the other group entered and a clap of thunder shook the building. *This could be a great time to shift our lesson into more of a conversation while they snack on their goldfish. We can talk about how they felt not getting the same amount and seeing their friends pile of goldfish growing which theirs remained the same.* We entered the new space and got settled, each child having their own private pile of goldfish to snack on, separate from the pile they had obtained during the game.

“I want you to look at your goldfish and I want you to count them.” A chorus of blurred voices began as each counted aloud.

“I have eight” shouted Andrea.

“I have ten” voiced Anthony.

“I have eight, too” said Caleb

“I got six” Liz said

“One, two, three.... Seven! I got seven!”

Andrew is so excited about those goldfish.

“I heard that some friends got eight, and ten, and six and even seven goldfish. Wow. We all had different numbers. What do we think about that?”

“Ms. Jen. Ms. Jen, when are we going to write our letter?”

Andrea, always making sure we are staying on track. We are getting there dear, don't worry!

“How do we feel that we all had different numbers?”

“It made us sad.”

“Why did it make you sad Andrea?”

“Because, because...” shouted Anthony.

“Wait, right now Andrea is sharing her ideas.”

“Because um, um, um, it would make me sad.”

“It made me sad. I rolled a six and I did not get one” interjected Andrew.

“Anthony what were you going to say?”

“I think we’re sad because some people weren’t going to have enough goldfish. Like they might have one or two or not enough.”

“So some people have more goldfish and some might feel like they might not have enough?” I asked, looking for clarification and confirmation.

“Yeah! Like the yellow person yesterday” shouted Anthony, now up on his knees waving his hands in the air.

Yes Anthony, yes! That is the connection I wanted to see. My heart was bursting. I was so proud of these children. They saw the connection between our game and the social justice topic we had discussed. No longer were they sympathetic, but now they could be somewhat empathetic. It was time to write and snack on those goldfish; a treat well deserved.

Sharing the Pen. While I was planning this lesson I had visited the local Feeding America website for our area to obtain statistical information surrounding the number of children who lacked steady access to food in the area. In our section of the website it directed local constituents to submit letters to their senators and representatives urging them to visit the local food bank. This visit would, according to the site, allow government officials to see the food

bank and witness the impact having stocked food banks in the area were having on community members. It seemed like this could be a great opportunity for the children to take an action orientation, and engage in some literacy instruction centered around shared writing.

Following our final iteration of the game, I gathered the children on a small carpet, an easel placed off to my right, adorned with chart paper and chart markers. I had done this so many times before; engaged in shared writing with a group of children, but somehow this one seemed so much more daunting. The message of the writing in this situation was more powerful this time around, especially compared to past shared writing experiences centered around classroom field trips. I was thankful our discussion had proceeded so well the day before. Now came the true test- could we put our thoughts into words and use those words to become advocates against child hunger.

“Remember we talked about with our lesson yesterday that after we played our game we were going to write a letter? We are going to do that now. We need to tell the person we are writing to why it’s important that everyone has food.”

“Max” blurted out Caleb.

“Max?” *Who in the world is Max? There is no child named Max at our school. Did they read a story about this topic with a character named Max? Not to my knowledge.* Caleb continued.

“Max doesn’t get food. Sometimes he is hungry.”

Whoa. Could it be that Caleb has a friend this topic connects to? Is there someone he knows who is experiencing child hunger? I waited for him to say more, but Caleb sat, staring at me. The conversation stalled, I glanced at Oscar, who was now laying on the floor, feet in the air.

“I want you to tell me some of the things we talked about already. Tell me about the game we played.”

“Some people didn't get to eat goldfish and some people did.”

I began to scribe the words Caleb had shared with the group, using think alouds to remind the children about writing conventions such as capitalization and ending punctuation, as well as modeling how to spell basic words phonetically. As I did this I looked out of the corner of my eye. Leo had now begun to move to a different center, leaving our group on the carpeted area and sitting at a small table in housekeeping.

“So some people got goldfish...”

“And some people didn't get goldfish” finished Caleb.

They were off to a good start. I wanted to prompt them to continue to think about the game and make connections to their feelings during the game, what they had learned about the issue and why it was important for them to share.

“Do you remember when we looked at the people. Some of them were green and some of them were yellow? How many were green and how many were yellow?”

“Four were green and one was yellow” said Oscar.

Suddenly Natalie entered the room. Andrea quickly recapped for us what had happened so far during the lesson and how we were writing a letter. As a group, reread the words we had generated thus far, deciding how we wanted to proceed.

“Four were green and one was yellow. What did that represent? What was the big idea we were talking about with the yellow person?”

“The yellow person doesn't have enough food” shouted Andrew, jumping up and moving towards the chart paper.

“Yea, some people didn't have enough food” restated Andrea.

“The yellow person didn't get food. He might only get one piece of food.”

“He was sad” stated Ronald

“Why is it important that we have food?”

“To be strong and healthy” stated Oscar.

“We need it to be alive” replied Liz and Natalie in unison.

“The people who don't have so much goldfish might be sad. I was sad when I did not have goldfish. I was sad too.” Liz dropped her head as her voice trailed off, recalling the sadness she had experienced.

Liz was sharing such an open reaction to the game. She had frequently had less goldfish when playing the game and became upset, being comforted by the other children in the group.

“Let's write about that” I said, adding her words to the letter. She smiled.

I closed the letter, showing the children how I could sign my name and applauding their efforts to communicate the ideas we had focused on. Placing the scented markers on the floor below the easel, I invited them one at a time to come up and sign our letter. Taking their time, they wrote their names below our words, stopping to find the parts they had contributed to our letter.

“What will you do with it now Ms. Jen?” Andrea asked.

“Well, I am going to take a picture and share it with Feeding America and our state Senators.”

“Can we hang it up? I want my mom and dad to see it.”

“Yes Anthony, that would be a great idea. I know the perfect spot.”

After the children had been taken back to their rooms I entered the office of the director. Giving her a recap of the lesson, I asked if I might display the children's work on her office door for families and other children and teachers to see. Thankfully she said yes. I mounted the letter to the door, capturing a photo to upload to the website for Feeding American that evening.

Maybe I should send this to the families too? I have been sending them quick recaps of the lesson and what we are talking about, but maybe sharing with them the information we looked at about child hunger and the letters the children constructed would be a valuable tool to spark conversation at home. Who knows, maybe some of them might visit the food bank or donate food to it. Maybe we could tour it one day or host a food drive here or....

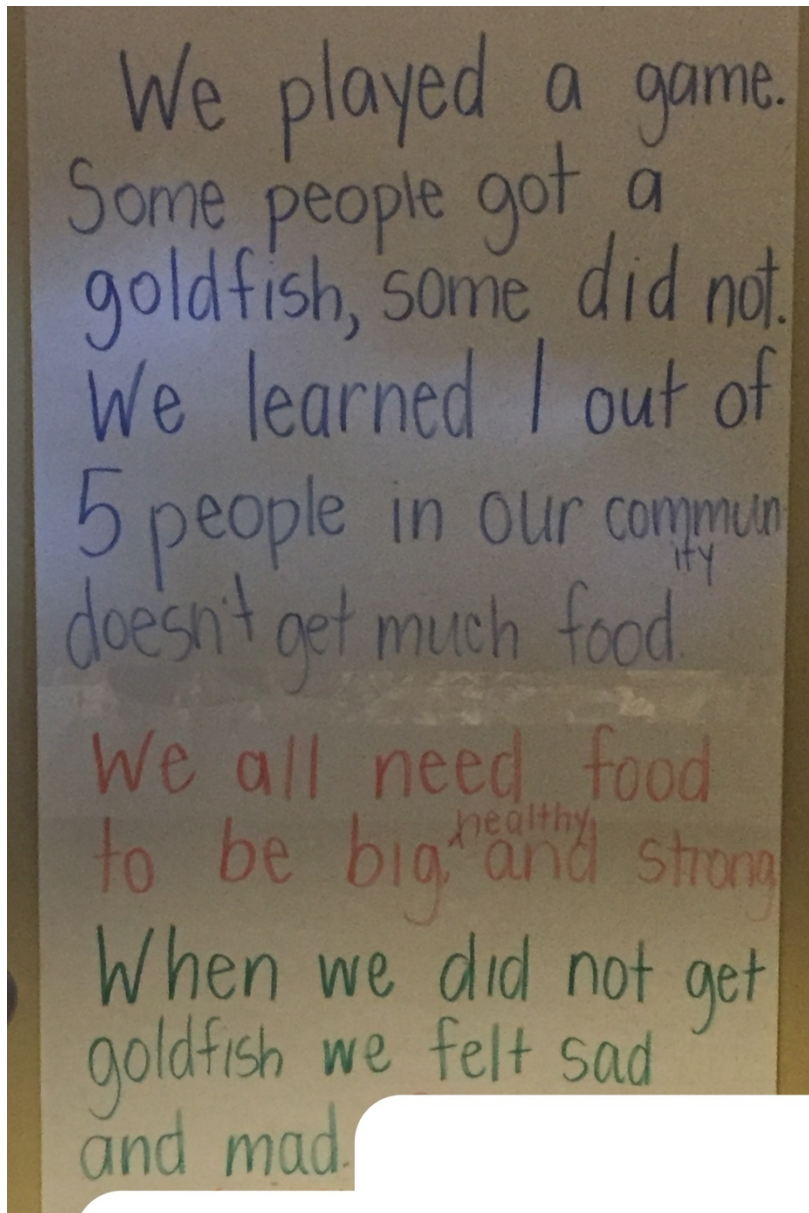


Figure 15: Letter About Child Hunger

My head was spinning with ideas. I paused stopping to collect my thoughts. *Don't get too excited Jen. It's just one lesson.* The voice inside of me was trying to reign in my creative juices, but I was too excited. It had been great. This experience was what I had been looking for when I started this work. This was the kind of lesson I wanted to create and the kind of product I wanted to produce. I grabbed the rest of my supplies, said my goodbyes and almost skipped out the door. Our usual summer afternoon rainstorm in progress, I darted to my car through the soggy, muddy

parking lot. Although clouds loomed overhead, inside I felt like sunshine, emerging following a torrential downpour and brightening up the day. I felt exhilarated. I felt like I could take on the world. I felt like I was making a difference, but more importantly I felt proud of my children for showing that they could, and should, talk about these issues.

Where Do We Go From Here?

Riding on what seemed to be a positive end to the child hunger lesson, I was eager to plan our next set together. I finally felt that I was hitting my stride as a teacher doing this work. Children were able to demonstrate learning about the social justice topics and the mathematics content, management considerations were coming together; it felt like we were truly beginning to be a team of learners. My confidence was growing, a feeling that *maybe* I could be capable of doing this work with fidelity was beginning to creep into my brain. *How can I build on this? I really want to make sure I am continuing to connect to their interests, to what they are doing within their own classroom projects.* Knowing that I wanted to foster a connection between what I was working on with children to their current classroom inquiry projects, I set out to spend time observing in the classrooms where they were spending their summer days.

I walked through the rooms and halls of the school, gazing at the documentation of in progress projects which adorned the walls and hung from the ceiling. It was in one classroom where I stopped to watch some of the children from my group spending time in the housekeeping center. A small table was set up in the middle of the center, some children sitting at it pretending to eat a meal off of red and green plastic plates while others attempting to feed the pretend babies which were located adjacent to the center. A group at the center was busily digging into the pretend refrigerator, pulling some of the empty boxes and spice bottles stored inside from the shelves. As one the children gathered the items in a basket, the other moved towards a shelf

dividing the space between this center and the reading area. On top of that shelf, a cash register sat, which the children began to interact with. Placing their palm on the number buttons, a ding rang through the classroom, simultaneously opening the bottom of the cash register. Andrew, who was at the center, let out a shriek, then moved to the cash register, removing the faux paper money and plastic coins from inside. He turned around and began to distribute the money to others at the center. The children began to participate in the exchange, taking the money, then attempting to move to the cash register themselves. I watched as this interaction continued, and diminished, noting that I wanted to ask the teacher about the children's interest in the cash register and money during our planning session later that day.

As we settled in for our weekly planning meetings I brought up the play situation I had seen earlier in the day to the classroom teachers. They quickly explained that the classroom had newly acquired the cash register at the beginning of summer, when some new materials had been purchased for the school. The money itself had been recently added to the center after being laminated for preservation purposes. They told me children visited the tools on and off, not really having much explicit knowledge of the cash register or money, both cash and coins. They enjoyed making the tool open and close and distributing the money to their friends, acting out scenarios where they were exchanging the money for "goods" within the classroom centers.

Money, finances. I just read an article in Teaching Children Mathematics about financial literacy with children. Maybe I could do something with these children and social justice. I mean, Chloe (my daughter), is about that age. She is really interested in money, her allowance and how I purchase things. Can I possibly capitalize on the novelty of this new tools for both dramatic play and mathematics to connect children's interests to the idea of financial

inequality? Perhaps. I need to get to work and pull some stats, though. This one might be a bit tough to work through; I am definitely using a game again.

Awakened and revived after a busy morning that left me feeling worn out, I continued to help facilitate our planning session, carefully listening to the dialogue around the classrooms project, silently brainstorming how I might plan by our upcoming lesson. As we wrapped up our meeting, I thanked the teachers and retreated to the upper level loft of the school. Opening up my computer, I conducted a google search for income information from the US census. Quickly I learned what I had already guessed; Black and Hispanic populations earned less than their White and Asian counterparts.

After inputting the averages weekly earnings per year for Asian, Black, Hispanic, and White. I determined the overall average of weekly earnings. From here, I calculated the percentage each ethnicity made of the overall weekly earnings. For any race that was over 100% of the average, both Asian and White, any possible number spin in our game would yield “earnings” of two dollars. For Hispanic and Black populations, they could earn two dollars with a spin of zero to seven, but by spinning an eight or nine, they would earn only one dollar. *Now how to simulate the race of the children?* I knew that my group had representations of each of these backgrounds, but I still wasn’t sure I had built enough of a rapport with the children to put them into the lesson so directly. Within my planning journal I wrote:

I am torn about how to represent the “race aspect” of the lesson. I mean we have a representation of each in our group, but I worry I might do too much harm playing the game with them spinning just the number for “earnings”. They will certainly get the idea of fairness and what is not fair with income if every time we spin Leo

and Liz get \$2, but the rest, on occasion, only get \$1, especially if Leo and someone else spin the same number. I just don't want any of them to feel so defeated with the game. I don't want them to be sad. Am I protecting them too much? (*Reflective Journal Entry, July 20, 2016*).

I put my head down. Suddenly a feeling of exhaustion had set in. The high I had been running on dwindled away, leaving another sense of doubt looming over my head. Cursor blinking on my planning document, I hit save and shut my computer. *Maybe if I avoided planning for a bit, the answer will come to me. Maybe there will be some sort of a sign of what choice I should make.* I gathered my things and descended down the steps from the upper loft area. Andrea and Natalie were getting picked up and rushed over to say goodbye to me. I greeted their families, gave both the girls hugs, reassured them I would see them soon, and slid out the door.

CHAPTER SEVEN

FINANCIAL INEQUALITIES

Entering the school, I began my usually routine. Casual “good mornings” to the office manager and director, dropping my bags in her office. I then moved onto greeting the teachers who were usually busy gathering children for breakfast or transitioning them into the classroom or out to the playground. Today however, one of them stopped me as I glanced at their sign in sheet.

“Hey Jen. Just wanted to let you know that Oscar and Caleb’s last day was Friday.”

“Oh”, I said, pausing to think about the implications for my work. “That's too bad. I was really enjoying working with those two. Oscar was finally starting to come around and really engage in some of our conversations. Caleb was such a strong mathematical thinker too. I wish I had had the chance to say goodbye to them.”

“Yea, we didn’t know until Friday morning. I guess they are going to enjoy the rest of the summer before they start Kindergarten in the Fall.”

“Well, I am glad they will have time with their families then.” I swallowed thinking to myself about the work we had done together thus far in the summer. *I wish they could have been here for the new lessons. Caleb was always my child who appeared to bored. I think he would have been successful in this set with the games and really enjoyed it.* “Thanks again for letting me know. I guess I will just grab any of the others who are hear and wanting to work with me today if that's alright?”

“Sounds good. They have been really excited to go with you. I am sure that they will want to come today.”

Pausing, I changed my mind and I told the teacher I would be back in a moment and exited the classroom. I needed to collect my thoughts. When I stated the work I did not expect it to go so quickly. I wish I had an entire year with this kids, but it was summer, and many of them were taking vacations before they returned back to school for the fall. Deep down I knew this day was coming, but I had grown attached to my children and was disappointed I did not get to say goodbye.

Reentering the room, Andrea approached me.

“Ms. Jen, can we come do some math stuff with you today?”

“Of course.”

“Do you need help getting everyone? I can go and get them for you?”

“Yes thank you hunny. I will meet you guys in the hallway and we can walk over to the other room together.”

Andrea gave me a quick hug, then went about gathering the other children. Smiling, they approached me, running past to head to our workspace. I smiled too. *They are excited. I wonder if they are more excited for the math or the conversations? Does it matter? No, it doesn't. They are happy and exploring. Exploring mathematics, but seeing how it is used in the world. They are talking about issues that, at least I think, are important. They are really going to do great things in the world.*

The Game Begins

Having used the people for the child hunger, I decided to use some counting bears to launch into our lesson on financial inequalities. The children had counting bears in their

classroom, so this manipulative was not quite as novel as the connecting people used before. The bears also afforded me the leeway to use varying colors; a way that I could the springboard into the discussion of varying races.

Placing an orange, blue, green and yellow bear on the floor for the children to see I explained that each bear was going to get some money. The children were doing to be responsible for helping me to count the money each was getting.

“Each of my bear friends is going to get some money depending on what color they are. I like yellow, so he is going to get ten dollars. Will you count with me?”

The children chorally counted to ten as I placed the money in a single pile in front of the yellow bear.

“My mom’s favorite color is orange, so that bear is going to get ten dollars too.”

“The green one and the blue one don't have any money yet,” called Liz, pointing to each of the two respective bears.

“The blue bear, well blue is an okay color, so I am going to give him seven dollars.”

“No, no, no!”

Andrea was adamant that I should not be giving the blue bear seven dollars, but I ignored her, attempting to provide wait time for other children to recognize this is not fair. Proceeding to count out seven dollars, I placed the money in front of the blue bear and moved on. As I was doing this, Anthony reappeared from leaving the group to get a drink.

“Did I miss it; did I miss it?”

“You missed, blue gets some of it” said Andrea, referring to the partial amount of money the blue got in comparison to the yellow and orange bears.

“And I know green is not one of my favorite colors either, so he is going to get seven dollars as well.”

“Well I like the blue and the green ones.”

“I don’t really like those colors though. So they don't get as much. What do you think about that?” I asked, inviting the children to begin to talk about what was fair and not fair during this interaction and money distribution.

“I like them, how about eight dollars” posed Natalie as an idea to get her two favorite bears more money.

“What about if we ask the orange bear or the yellow bear if we can borrow your dollars and then the orange bear and the yellow bear and all the bears”

“So they could all be the same?” *Shoot Jen, You just cut her off. Be quiet and listen.*

“If these bears” she said, pointing to the blue and green ones, “if these don't have some and they take it from these bears (pointing to yellow and orange) and they finish it off then all of these bears they will not have money.”

I stopped to try to and wrap my head around what she was thinking. She must have sensed my confusion because she spoke again.

“So like these bears (blue and green) take some from these (yellow and orange) so they have the same and then, then they finish it and it will be gone, but they all have the same.”

“Let me make sure I understand your thinking correctly. You guys told me the orange and the yellow bear had ten dollars and that was more money than the blue and the green bear and that that was not fair because these two bears are going to run out of money first before these two bears do. You also told me that figuring out, just picking colors, the colors that I liked and giving them more money, that was not a good way to give my bears money.”

“It’s not about your favorite color. It’s about the bears you put out.”

“So Anthony, if all these bears are doing the same job, let’s say they are all teachers at a school. They've had the same job for the same amount of time and went to school for the same amount of time. The only thing different about these bears is their color. Should they get different amounts of money?”

“NOOOOOOOO!” Leo was clearly up to speed on the topic we were addressing.

I was so thankful for Anthony’s contribution at this moment. His idea had truly helped move our conversation along. Now that we had a common understanding amongst us of how the children thought the problem could be solved, I was ready to layer in the game idea, setting us up to connect the idea of race and making money tomorrow. First, however, I wanted to take time to play the game and focus on the counting and comparing aspect. I believed that if we made sure the children could play the game with success, then having a focus on the social justice aspects could take a front seat in playing the game the next day.

Since the children were really interested in the bear counters, I placed the group into teams of two and three, giving each a pile of counters to use and a spinner for each child. We reviewed the spinners, and the numbers which were present on them; zero to nine. I led the children through one round of spinning, each of the taking a turn to spin and then make a line of the number of bears which was spun. From here, I asked the children to compare their lines to see which line had more and less, thereby layering on the idea of comparing to the counting they were engaged in. My hope was, that by having the children compare the bears they would be more able to compare the amount of money they had at the end of our game the next day. This was a skill they had shown some hesitancy with during the child hunger lesson, so having this

time to explore comparing again would hopefully benefit their knowledge of content and maybe our discussion.

A Social Justice Twist. The following day I met with the children again to extend our game and add the component of race as a determining factor to how much money they would be given. I had decided on having the children work in teams, spinning to determine if they would earn one or two dollars for their work (which would depend on bear draw for race), then drawing a bear for race. Due to the flexible attendance schedule for the summer, this way I could ensure a variety of races were represented. Sitting on the carpet, the children got into groups again to play our game as I gave each group a cup with bears, one each of orange, yellow, green and blue, and a spinner. I held the money so that I could pass it out to each time depending on their selection and spin.

“Anthony is going to spin first for his group, Liz you’ll spin for your group.”

“I spun a seven” shouted Liz.

“I spun a nine” Anthony yelled.

“So now Natalie and Andrea, pick a bear from the bucket without looking. Natalie got a yellow bear, and Liz, since Andrea got a blue bear and you spun a seven, your team gets two dollars. Anthony and Natalie, since you had a yellow bear, you get two dollars.”

Each group took the fake money, making a pile in front of them. I facilitated a rotation of the materials for each group, and we proceeded to repeat the process of spinning and drawing again. This time both groups got a green bear so the spin would be critical.

“I got a green, do I get two dollars?”

“So green bears get two dollars if you get a zero, one, two, three, four, five, six, or seven. They get one dollar if you spin eight or nine.

“I got nine.”

“Natalie, you guys spun a three so you get two dollars.”

“I got a nine,” Andrea repeated.

“If you get a green bear and a nine you only get one dollar.”

“Only one dollar? Seriously?” Anthony was upset by this, and oddly enough his team had gotten the full two dollars.

During the next spins and selections, both teams got blue bears, so they all got two dollars. We continued to select and spin, teams getting combinations that equaled two dollars several times in a row by either picking yellow bears, or spinning numbers less than eight. It was on our final selection that there was finally a difference in the amount of money.

“Alright Andrew, what color bear did you get?”

“Yellow!”

“And Liz what number did you spin?”

“Two. So we get two dollars right? Yellow always gets two dollars.”

By now most of the children had caught onto the game. I had seen Anthony several times trying to select bears with his eyes open, slyly placing red and green bears back into his draw cup for their yellow and blue counterparts. When I prompted him, he would draw again, but grunt, as if to warn me of his frustration.

“Okay, Natalie, what color bear did you get?”

“Red.”

I did not even have to stop to ask Anthony which number he had spun before his response told me all I needed to know.

“OH MAN!”

“Anthony, what’s”

“We got an eight. We only get one dollar. ONE DOLLAR!” By now, Anthony was yelling to me and Natalie, visibly upset that his group did not get two dollars for this try. I felt bad, but the point I was trying to make was being made. I hoped we could capitalize on their feelings in the conversation that followed.

“What did you notice about our game?” Silence. More silence. “Did we always make the same amount of money?”

“No.”

“Tell me more Andrea.” *Seriously, this girl is a rock star. I mean she is getting it; always involved in every conversation we have. I am so thankful she is in our group.*

“Um, in the game we already started you showed us what to do first, then we played. Then we got some money. Anthony and Natalie, got two money like us and our team got two money and there team got two money and the last game, we got one money (point to Anthony and Natalie) and we got two money. So um, our team, our team, have much more money than that team.”

Okay, she is starting to engage in some comparing which is good, and she clearly has an understanding of what happened during the game, but what about the fairness aspect. How do I pull that out more?

“How did we figure out how much money we had? How did we figure out how much money Ms. Jen had to give out? You had to do two things.”

“We had to spin the spinner and get which bear for the money its gonna get us.” Natalie perked up as her partner shared the synopsis for us.

“Did all the bears get the same amount of money?”

“NO!”

“I noticed some of you during the game were trying to pick certain color bears. What colors were you trying to get?”

“We were trying to get, to get the blue to get two dollars.”

“What happened if you picked a green or red bear? Did you always get two dollars when you got a green or red bear?”

“No. That don't make sense.” Natalie sat up and looked me in the eyes, extending her arms and shrugging her shoulders as she spoke. “Maybe it don't make sense for them to get one dollar. Someone could get six dollars and someone get no dollars and that isn't fair.”

“So we all were picking bears. They were the same animals, just different colors. Should they get different money based on what color they were?”

“No,” said Andrew solemnly.

“That's what happens sometimes in the real world. If you have different color skin, you might not get as much money for the same job.”

The children fell silent at first, then Andrea glanced at her arm.

“What color am I?” she posed the question to the group with no response. “Would I make money?”

“We should all make the same money if we do the same thing” Liz piped in.

I fell silent for a moment, my own thoughts running through my head. Looking at my group of children I knew many of them would be facing this very battle when they became employed. For some, even, they could potentially make less because they were female. The struggled with leaving them feeling hopeless bubbled up again and I was unsure how to leave the group that day. Fortunately, one of the teachers thrust open the door, signaling they needed the

room back for a group coming in from the playground. I quickly thank my children and we exited. I knew deep down this was a missed opportunity, but did not yet feel comfortable addressing the topic on the spot.

Abrupt Endings

Having wrapped up the final day of our game I prepared myself to begin to work with the children on our culminating task for the financial inequalities. My plan was to work with the children to create a Haiku Deck. The children would generate words and phrases to talk about our lesson and their thoughts on the issues, then the program would locate images on the web that “matched” that word or phrase. I sat in the upstairs loft trying to figure out how I would do this with the group; would we use the touch table or the interactive white board? Maybe I could just bring in my iPad? A set of footsteps coming up the stairs interrupted my thoughts.

“Hey Jen. Just curious when you will be done with your group? I wanted to start a new project.”

This can be my out. I am tired. I feel like we regressed during this lesson-maybe my planning was way off, maybe it's too much in too short of a time.

“Yea, um, no worries. We did some talking about the issue today and that can be our final product. I have the children’s words in the video so I can use those. This way you can get started.”

“Oh great. Thanks. I know they are really enjoying the work. I think it has been really good for both Andrea and Anthony. They both need that enrichment you know?”

She's right, this has been good for those two, but what about the others? Have they gotten anything out of our lessons? How can I be sure? And, although Andrea and Anthony did well this should not be simply just an enrichment tool. Shouldn't all the children have access to

and be able to engage in these conversations? Not just some? Wasn't that one of the impetus' for doing this study?

I sat up there for a while, hiding from the school below. I wasn't sure I had been able to accomplish what I had set out to do in the lessons. I felt like I still needed to know if I had “done the lesson right”. I knew there were things across all the lessons I would have done differently, but I had a whole career to work that out. I truly was able to step into the role of a novice educator doing this work. *I sure do feel like a novice. I think it's time to be done for the summer. It is August after all, their regular class session will be starting next week.*

Closing my computer, I placed it into my bag along with earbuds and pushed in the chair that I had utilized all summer. Turning off the light and fan from the faded tan switch hidden behind a bookshelf, I descended the stairs slowly. As I got to the bottom, I turned and went to say goodbye to the director and teachers for the day. *I'll be here in the fall and I think now I can move onto helping the classroom teachers have some of these conversations in their classroom. I mean, I know it is happening in some and I can tell that from my work with children this summer. I think I can help move it to more classrooms now, and maybe even help the teachers connect it to mathematics.* My emotions were mixed as I walked out the door that day. Sadness at leaving my children, happiness at moving into the next step of work, pride in the work that we had accomplished together in such a short amount of time, and wonder at what the children would take from our time together. The door to the school closed behind me as I stepped outside. I took a deep breath and headed to my car.

CHAPTER EIGHT

EPILOGUE

Shortly after I wrapped up the lessons at the school a new semester began. I took time to prepare my course syllabus and get everything squared away to begin teaching the mathematics course I held so close to my heart. I knew I wanted to infuse many of my experiences from the summer into my work with pre-service teachers in our early childhood program, and to share some of my experiences candidly with the teachers at the school where I had done my lessons. These plans were briefly put on hold as I welcome another daughter into the world, but as soon as I was well, I returned to both classroom and school to continue this journey.

I was greeted on my first day back to the school site with both waves and hugs from those children I had spent the summer with. Andrea instantly asked me when we would be doing some math together, and even Leo recalled our time together.

“Can we do some more math games? I mean with the people and the bears?”

“Maybe another day, Leo.” I was pleased he had remembered our experiences from a little over a month ago, but felt a twinge of sadness that his recall seemed to be limited to using the manipulatives I had brought and playing games. *Did he remember our conversations? Did they remember the issues and concerns we were discussing together?*

While my journey contained many ups and downs, I continue to believe that this work is important and that there is a need to share my story in hopes to reconceptualize the capabilities of young children. While I reflect on this experience and craft the final chapters of my dissertation the rollercoaster of emotions continues. I still question my place in entering the field

of social justice teaching. Looking back, I can see where I could have strengthened the lessons, but am still left questioning my place in doing this work as a white, middle class female. I continue to question if I addressed the needs of my children appropriately; did I get to know them well enough mathematically as well as learn about what they felt were important issues within their lives? What if I had used the game based approach sooner, would they have understood more about the social justice issues and been more apt to take an active stance?

I can remember back to my very first classes as a doctoral student. Sitting in coursework with other students who had at least one classes behind them, some of them being close to graduating. Sure, I had been the top of my cohort during both my undergrad and graduate degrees, but this was a whole different ballgame. I mean, what did I know about doing research? I had my experience to draw upon, but these people were citing educational philosophers that I had never heard of, nor could I pronounce. *I am a fraud. There is no way I can do this. It is impossible. Balancing all this reading, which is taking hours since I need to look up almost every other word, with my new role as a PRT and a mom. How am I going to survive? I don't belong here.*

Flash forward to the end of my coursework and qualifying exams. The same doubts set in as I read and reread the literature within my field. This was it. Surely my professors were going to now realize that I did not belong in doctoral studies. They were going to get the responses to my questions and either laugh or cry, coming to the stark realization that I had now wasted four years of their time. I shared my fears with my husband, who shrugged it off as nervous stress before exams, and with some friends closest to me who had undergone the same process. They reassured me these feelings were normal, that they had felt the same way. It gave me a sense of comfort I was not alone, but in the back of my mind I remembered. That was them- they had

passed exams and since graduated. Their place in academia had been proven. Mine was still under question. *Surely this is the time. I am going to be revealed. I knew deep down I did not belong here. Now everyone will know it too.*

The sense of “I can do this work” came and went during planning and implementation, just as it did during my time as a doctoral student. Current events related to topics of race repeatedly made headlines and flashed across my phone as news alerts throughout the day. During the first planning session I struggled to figure out if and how I could address these current events happening in the country. These included two widely publicized police shootings of African American men and other shootings of police officers at protest rallies resulting from the initial casualties. Within my planning notes, I recorded

Tension with current events (police shootings of African Americans, shooting of police at protests/rallies) and wanting to pull in this information but tentativeness due to working with families, children’s understanding (*Reflective Journal Entry, July 10, 2016*)

The next day following the implementation of day within my lesson plan, I wrote:

I feel stuck as to what to do next. I want these lessons to go well and it’s frustrating as I feel I am not focusing enough on content or social justice elements. Do I really know enough to be doing this? Am I capable? Are my own conceptions of issues and concerns within the community skewed because I am an older female with higher education and income? Maybe my own understanding of the mathematics capabilities of young learners are warped from

both my own experiences teaching and as a mom. I think that Chloe would be capable to these tasks and conversations but maybe I am wrong (this is another project to be done later....).

Have I lost touch within being able to work with young children?

(Reflective Journal Entry, July 11, 2016)

Sheepishly, I ducked away from talking about these issues. Looking back, I was afraid. I still grappled with wanting to protect the children I was working with. I was afraid that families would pull their children from the study. How could I possibly complete my work with no children to work with? It was one thing to talk about what was occurring in the world with my own child; to watch the nightly and morning news and be able to help unpack the images she was seeing on the screen. It was a different story to talk about these things with somebody else's child. *What if they were trying to shield their children from this at home? Would they even want me speaking about it?* The dissonance I felt in addressing these issues continued to plague me. *I certainly don't want the children to feel hopeless or scared about the world, but at the same time I don't believe I can shelter them. Where is the balance between protecting their innocence and developing their awareness? Who draws that line? Is it up to me to determine that as an educator? Is it up to the families to express their desires to me? How could I accommodate the wishes of so many different families with different views?* These questions rolled around in my head as I continued to talk to my support network. It was finally my husband who offered advice to me in the form of a single question.

“What if you don't talk about these things?” he asked, as I rambled on about my inner struggle over dinner at one of our favorite restaurants. I paused, contemplating his question in between bites. *He can tell this is really bothering me.* My husband has this weird way of being in

tune to my feelings and inner thinking around work, using this knowledge to talk me down when I am either stressed out or so stuck in thinking about something work or school related.

I continued to reflect on our conversation through the ride home, and in the coming days. The more I thought about the issues, the more I began to question myself in doing this work. I am a white, middle class woman. When I drive down the road, I don't stop to worry about being pulled over and possibly met with force. I don't worry that my husband will make it home from work safely, other than the looming threat of bumper to bumper traffic that might insight a minor accident. Reading the social media posts of some of my friends at the time, waves of emotion washed over me. Many of them expressed these fears. People whom I assumed would never have to experience these fears, wrote them in plain text. *I can't even relate to this. What business do I have speaking about issues of social justice? I live a life that is privileged within the dominant norms and discourses of society.*

These tensions continue to swirl around in my head even now after I have completed the lessons and move into writing and thinking about the next stage of my work in TMfSJ. Do I belong in the community of educators working to engage children in TMfSJ? I believe that I do, but recognize the need to continue my own professional development. A critical component of this work rests in reflecting on my own views and beliefs centered around issues of social justice, and I need to continue to explore where I come from, what I believe in.

CHAPTER NINE

DISCUSSION

This autoethnography explored the experience of an early childhood educator engaging in teaching mathematics for social justice with four and five-year-old children. The question guiding this study was, *what are the experiences of an early childhood educator working towards teaching mathematics for social justice?* As discussed in chapter three, data for this study included researcher reflective journals, lesson plans, videotaped lesson implementation and student work samples. In chapter four, I presented my narrative account of the summer sessions; my experiences in both planning and implementing the lessons centered around TMfSJ. It is my hope that the narrative was able to draw you into the work so that you feel as if you were a part of the journey.

Writing this piece has allowed me to examine what I did during the dissertation process, leaving me with head full of ideas as to how I would do things differently the next time around. Just as my learning during doctoral coursework served as an impetus for this project, this project has served as an impetus for my next journey, whether it be working with pre-service teachers or young children. As autoethnographic methods allow the author / researcher to critically examine their own experiences (Duncan, 2004; Spry, 2001), I use my narrative account as a point of departure for conversation related to endeavor of TMfSJ and why this experience has been challenging, yet transformative in nature (Adams, Holman Jones & Ellis, 2014).

Seeking to maintain coherence with critical perspective taking, I drew from Brookfield's (1998b) definition of critical reflection which states that "critically reflective practices is a

process of inquiry involving practitioners in trying to discover, and research, the assumptions that frame how they work” (p. 197). While I did use my own interpretive lens to make meaning of this work, I attempted to move beyond affirmations (Brookfield, 1998a) and self-blame to examine issues of power and control, which are evident in all aspects of society and schooling (Brookfield, 2009).

In writing this piece I attempted to compose the narrative as authentically as I can remember it. While some conversations and occurrences were compressed from multiple days to smaller episodes, most conversations reflect the actual words of my children, taken from our video accounts. Based upon my interpretation of my reflective journals and narrative, I espouse several points for consideration by those who connect with this work. These points include: power and control in the classroom, perpetuating deficit views, the need for relationships, and finding a balance between content and social justice.

Power and Control in the Classroom

Management - A Disguise. Congruent with Sleeter’s (2008) assertions, that new teachers progress through stages of focusing on themselves to a focus on the children and learning within classrooms, my beginning reflections centered around care for myself. I felt much like the pre-service teachers I work with on a regular basis, very focused on how to get the children to “behave”. Line after line I filled my journal with a discourse centered around the behavior of my children, lowering my expectations and an overall focus on what they were unable to do within our time together. I wanted to make sure the classroom was being “managed” in the sense that children were behaving “appropriately” and using the mathematics tools how I had envisioned they be used. Very little did I stop to examine that ways in which the children were making sense of the lessons and tools we were using to enact mathematics. I was

stuck in what Brookfield (1998a) references as a dichotomy of professional beliefs; either the children were behaving or they were not. I also was falling back on a common narrative within education; that children *need* to behave during lessons.

Ironically enough it never dawned on me until after I completed my work that as we were talking about issues of power and control in our lessons, I was perseverating on having power over the children in the classroom. I wanted to make sure they were behaving how *I* wanted them to. I was designing the lessons based on what *I* thought they would want to talk about (or even just what *I* wanted to talk about). Who was holding the power? *Me*. I felt the need for them to listen and be controlled so that I could help them learn, so that I could bestow the knowledge I had upon them. In my focus to shield and protect them from topics that might cause discomfort, I was doing harm by depriving them of their voice and thinking.

My hesitancy continued as I move forward in the work. Even with a wealth of knowledge about the pedagogy and content of early childhood mathematics, I continued to focus on the overall behavior of the children with whom I was working. This sustained emphasis on overall behavior of children offers some insight into why teachers may be hesitant to engage in this work. Ideas, such as the behavior indicating something is too hard, too boring or unengaging to children, may bubble up, and therefore idea of TMfSJ abandoned. As I rooted the issues with behavior to the length and presentation of my lessons, as well as my relationships with the children in my group, I turned to my experiences as a Kindergarten teacher to guide my work. What did I believe about teaching young children? What did I hold true about this work?

Somewhere in the planning and the focus on controlling the children, I lost recollection of how I had worked with young children in the past. Were they bored? *Yes*. Was the topic too advanced? *No*. Swirling in my head, these questions provided me with the prompts to then

question the instructional practices I was using during our meetings, which helped me find the work of another. For me, the child hunger lesson marked a return to a practice I held true as a classroom teacher so long ago- using games to reinforce mathematics content. In my prior experiences as a classroom teacher I frequently used game structures to reinforce and differentiate mathematics content. Adding the social justice element to this idea seemed not only worked to infuse ideas of fairness, but also to support the children in developing the beginnings of an empathetic stance on the topic we were discussing, allow them to make sense of the social justice issue and construct meaning about the topic, rather than me telling them what to think.

Capable Beings - As Long as You Think How I Want. It wasn't until the children began to take an action orientation or give the ideas I wanted them to that I felt they were capable. Looking back, I question what constitutes an action orientation? Did they need to brainstorm a way to address the social justice issue? Was engaging in conversations talking about it enough.

One such example of the profound aptitudes my children had during this study was their enactment of action against injustices. Kuby (2010) calls upon early childhood educators to reconceptualize their notion of what it means for children to engage in “social action” against injustices. While for many, including myself at the onset of this work, this idea meant that there must be some artifact for children to display. For example, when I was planning the lessons I had a culminating project in which the children would construct some sort of artifact to demonstrate what they learned in the lesson set and how they were working to talk about or address the issue. The final lesson served to rethink the notion of taking action against an injustice needing to be something tangible. It showed that taking action may also be a conversation in which children are engaging in dialogue with each other about the issue(s). Additionally, the child hunger

lesson, while it did have a written letter that was produced and sent to our state officials, had rich conversations that were started and continued by the children surrounding why one in five children not having access to food was a problem, and how we might work to address that issue in our community.

Pacini-Ketchabaw and Viruru (2006) state that “Children are increasingly being perceived as highly capable beings who are more able to participate as citizen than ever before” (p.266). In the case of Anthony, he began to demonstrate a questioning of words he had heard uttered at home around people needing to work hard to have food. Within our lesson, Anthony began to wonder if having access to food was always a reflection of this work. His words showed his own mind grappling with whether there were other reasons why people might not have food and how he could help support them. It was this example that resonated the idea that Kuby (2010) espouses: perhaps conversations with peers and with educators can be a form of social action. These events, these conversations, after all, do serve to shape the lives and subsequent experiences of these children.

I spent time during planning and implementation frequently worrying that I might, inadvertently, present the message to the children that something in their lives is hopeless; that the world is full of negatives. I wanted to protect the children. The idea of protecting the children and keeping them safe was working against me in this instance, as it potentially stifled the thinking and expression of the children. Ultimately, this resulted in there being little child voice within our lessons and our conversations. Lessons were therefore largely teacher centered, failing to capitalize in the out of school experiences of children, nor did they promote child agency as well as they might have. While elements of sharing and debate were embedded into the conversations we had, finding ways to involve children in the design of lessons would be

beneficial so that the issues we explored had a direct impact on them. Beyond this, finding ways to infuse real world learning experiences into the lessons such that they matched the real world experiences of children would allow for increased dialogue around social justice issues.

Perpetuating Deficit Views

Talking Badly About Children. The most upsetting moment throughout this work has been my revelation that I actively contributed to the deficit discourse around my children and their work. At moments during my study, I found myself frustrated with the way lessons were going, the conversations we were having, and my overall plans. It was during these times that I felt myself slipping back into a pattern of deficit discourse. As I reviewed my journal entries throughout the study I was pained at the number of times I focused on what was going wrong in the lessons, but more so the number of times I placed blame on the children or the practices of the classroom teachers they had. The toxicity of the words within my journal ate away at me and made it hard to find what had gone right during my lessons.

Valencia (2002) used the term deficit discourse to define a means by which teachers speak about the perceived underachievement of children, families, and communities. Using a deficit discourse can permeate through the school community, thereby impacting the academic position, opportunities and overall identities of young children (Ladson-Billings, 2006; Nieto, 2004; Villegas & Lucas, 2002). Although the words I scribed were not uttered out loud, they no doubt impacted my perception of what the learners were capable of. More than likely, these ideas seeped into casual conversations I was having with other educators at the school on a daily basis.

The deficit language used to talk about the children I was working with began during our very first interaction, one that had been largely designed to pre-assess and get an idea of what they could do. In the entry focused on our initial lesson counting and comparing numbers I began

to question the expectations I had for the children, indicating that they may have been too lofty. My words highlighted what the children were unable to do during lessons, rather than spending time identifying what they were able to do and how we could make the lessons better. developing a plan of action from that point.

The Classrooms as Victim. The deficit discourse did not only exist in discussion centered around the children, but also in my attempt to connect to their prior learning experiences within classrooms during the school year. When there seemed to be student conceptions around mathematics content that were incorrect, my blame shifted to the classroom teachers. *Surely they did not teach this content. I can't believe they did not introduce this tool.* Instead of taking this opportune moment to identify the children's background and experiences in their classroom and use those as a springboard to new learning, I attributed the confusion directly back to what the classroom team had not done. These deficit ideas connect back to issues of power and control within the school site, as I was perceived as an expert in mathematics and believed that there were certain ideas that should have been introduced.

In both instances, I failed to see my children as capable and rather dismissed them as being unable to engage in these lessons because of a lack of experience with tools and content. This should have been my time to uplift and remind them of their potential and the great things they would certainly work to accomplish during our summer together. A large concern with the return to a deficit way of speaking about children and classrooms rests in the fact that these utterances signified my attitude towards the children I was working with at the time. In emphasizing weaknesses, rather than strengths, I was failing to act as an agent of change for my children. Villegas and Lucas (2002) note a myriad of factors that can work against educators in becoming change agents, but articulate that this is not an excuse to become a change agent. I

believe that my engagement in this dialogue, while not intended to be hurtful, was an attempt at venting frustrations. Reading the reflections as I continued the study struck me to cease the discourse and focus on more of the capabilities and strengths my children were exhibiting.

If I, as someone who has a strong desire to see children as capable and refrain from engaging in talk which places children in a lens which focuses on any shortcomings, fell back into this pattern of discourse during planning and teaching, what would be different for someone who readily engages in these conversations? Having this happen to me showed that as a teacher educator I need to recognize when those I am working with fall back into these patterns and actively seek to support them in seeing the positive things that are happening. Maintaining a focus on what the children *are* able to do led my planning down a path that took more care to infuse the experiences and interests of children, rather than “remediate” what they did not know, or could not yet do well.

Needing Relationships

With Children. Although I had been working at this particular site for over a year, both mentoring teachers and engaging in classroom life, I felt as if I did not know the children well. Given, I had been privy to discussions on their current classroom projects, state assessments and overall dispositions, my knowledge of these children and their experiences outside of the school were limited. Furthermore, the children had only seen me in their classrooms as someone visiting their teachers or coming to observe and interact briefly at a center. I questioned if they viewed me as a visitor, or someone who wanted to genuinely get to know them and their capabilities. I noted the difficulty in this work, wondering often if things would be different if I had been with the children as their teacher longer. No doubt this would have impacted elements of power and

control I was focused on, but I would have also had a deeper knowledge of the children, their experiences and lives outside of the classroom.

During my prior work as a classroom teacher, the concept of building relationships and connecting with children in various ways was pivotal to my instruction. Collecting informal information from authentic conversations with both children and families helped to lay this groundwork. This was an essential step I failed to engage in at the onset of my study, and therefore felt disconnected from the children during the beginning lessons. While I knew them within the context of the school and as part of a bigger classroom community, their unique views and nuances had not yet been examined.

With Peers. Before transitioning to the PRT role and being more immersed at the university, I worked almost in isolation as a Kindergarten teacher. I did not like planning alone, but by the sheer nature of scheduling often times had to. There were no specials in Kindergarten and after school was a blur of checking email, meetings for varying committees and heading off to train. Planning along worked for me then. Our teaching team was only two teachers and I did a lot of things differently from my partner. We would share ideas with one another, but our instructional approaches were at different ends of the teaching spectrum. At this point in my career I was content to be an island. I had things figured out. I knew my standards, set high expectations for children, kept up-to-date with the latest pedagogies for instruction and overall had a handle on teaching.

These feelings all changed when I began this work. Although I was surrounded by teachers and children during my study and collection of data, I felt isolated and uncomfortable. Even as I compiled the literature for this study finding examples of TMfSJ done in early childhood settings was virtually non-existent. I had believed that I might be able to do this work

with little support seeing as I had pre-existing expertise in early childhood mathematics and social justice conversations separately. I quickly found this work was hard and had limited support networks to turn to. Within my journal I wrote of my feelings of loneliness in doing this work. These feelings turned to frustrations that I did not know who to turn to for support, and that there wasn't a guidebook to help me through the process of planning.

While I often felt alone on my journey in TMfSJ, I recognized that there are resources out there for support. My resilience led me to continue searching for ideas which I could build upon. While I found some ideas, locating them was tiresome and difficult. In a field that places strong emphasis on collaboration and refining the ideas of others, access to information for early childhood educators trying to TMfSJ should be common. Conversations around social justice topics should permeate conversations and planning, such that the ideas are not foreign and hard to come by. I often felt frustrated in my journey with the time and self-induced pressures to make this great for the benefit of others trying to do this work. *If it is so hard for me... if I feel so isolated and am used to working alone, what will this be like for other teachers?*

A Supporting Team. Feelings of isolation and solitude accompanied the work I did around TMfSJ with young children, in the sense that I am just becoming connected to the network of educators embarking on this journey. In addition, many of these people understand TMfSJ as it relates to other grade level bands and populations, whereas my expertise lies within the youngest learners. Consistent with Luna, Botelho, Fontaine, French, Iverson and Matos (2004), I felt the need to be listened to and validated and then pushed forward during my journey. Having a space in which collaboration could occur would have proved beneficial to my endeavor. Wenger (1998) asserts that communities of practice centered around social justice concerns have become no longer a lone educator working tirelessly, but rather a collaborative

space in which teams of people share their ideas and activities. Grant and Agosto (2008) go on to espouse that these communities share a way of speaking and thinking about issues such that a common knowledge is developed. Merely knowing of someone else doing this work provided the means for me to rethink my approach, but what if I had known that sooner? How can the network of early childhood educators even contemplating TMfSJ within their classrooms become connected? How can teacher educators working with early childhood pre-service teachers connect to share stories of social justice practices, as suggested by Gillette and Schultz (2008).

As is the case in ethnographic research I encountered those who had similar perspectives, divergent perspectives and strongly opposing or challenging ideas of if and how these conversations might be addressed with young children. Within the school itself I was able to find someone with a share set of ideas in the director, as she shared a common belief that these conversations should occur with young children. She afforded me the space to talk about my work in generalities, as the mathematics components were not something she was as familiar with. I found the some of the teachers voiced divergent perspectives, sharing the belief that children were capable of these conversations, but unsure what role we as educators have in their facilitation. To these people, I shared my experiences in passing as they asked how my experiences were going.

Still, there were those that opposed the idea of addressing social justice issues with young children outright. One such example came during our discussion of child hunger when Anthony shared the words of his father. Although I did not have any direct interaction with his father, the words echoed from Anthony demonstrated that the beliefs of his father might be in contrast to

my own. These were the beliefs that “those people who did not have access to food should work harder to get access” of which I did, and still do not agree.

Finding a Balance

The idea of only a focus on mathematics during initial iterations TMfSJ is well documented within the research literature. Gregson (2013) posits her struggle with ensuring that lessons were both mathematically rich, but also drew upon the pre-requisite knowledge of young children. This idea emanated in my work as I tried to differentiate the mathematics content I was addressing while simultaneously embedding social justice issues. As this dissonance occurred, I found myself often times feeling like someone entirely new to the teaching profession, resorting back to the content I knew best: mathematics. Part of this dissonance rested in the fact that I was challenged in my own knowledge of the community. I was (and still am) privileged and do not face many of the challenges we were discussing within our group time. Grant and Agosto (2008) acknowledge that educators working in the areas of social justice must have the knowledge, skills and dispositions to engage in conversations centered around critical topics involving identity and power. In my instance, I possessed varying components of both content and pedagogical content knowledge (Ball, Thames & Phelps, 2008). The specialized knowledge I held of early childhood mathematics, both content and pedagogy, although helpful in planning, proved to be lacking necessary elements of the community.

Situating lessons within game based simulations offered my young children a vessel which could be used to engage with the social justice and mathematics content, but I still favored the mathematics in these lessons over the social justice components. When teachers use play as a means to support mathematics content in the classroom, students begin to flourish in their conceptualization of the ideas being presented (National Association for the Education of Young

Children & National Council for Teachers of Mathematics, 2010). NAEYC and NCTM suggest that play experiences often include embedded mathematics, which support students in beginning to “mathematize”, or draw connections amongst mathematics topics, as well as to the natural world. Play consists of three main components: children creating an imaginary situation, children taking on and acting out roles, and children following a set of rules determined by specific roles (Bordova & Leong, 2007). Utilizing play to help facilitate students' exploration of the connections within their world and academic content can facilitate discourse amongst students, setting up situations in which students can communicate ideas to their peers centered around these topics.

Working to embed mathematics and social justice was by no means an easy task. I feel like none of the plans I crafted did this integration seamlessly. As the lessons shifted to focus more on learning through play, the children began to actively engage in conversations centered around the issues. They were beginning to identify the social justice issue as problematic, as evidenced by their conversations and dialogue within the group setting. Maybe if the children had been more involved, these feelings would be different. The lack of relationship between myself and the children, the lack of their voice in the planning process trickled over into our lessons. My own lack of community and contextual knowledge impacted the lessons- I simply did not experience the world as the children did, nor was I sure if these children had ever experienced any of these issues themselves. As such, the issues and concerns I planned for a focus did not align with the FoK children were bringing to the lessons. As early childhood educators take a social justice approach within their teachings, the critical nature of building both community and cultural knowledge increases (Fennimore, 2016). Brownlee and Berthelsen

(2006) remind us that children bring personal factors with them into schooling and that the role of a teacher is to use those factors when facilitating instruction.

Expansion of TMfSJ into Early Childhood Settings

This study presents my work as an early childhood educator TMfSJ with four to six-year-old children. While work has been done in this area centered around high school and college students (e.g. Brantlinger, 2013; Gonzalez, 2009), the presentation of someone engaged in this work with young children is limited (i.e. Murphy, 2009), especially from the perspective of the educator. Although relatively novel, this study reminds us that young children are capable of engaging in conversation centered around issues of access, equity, power and identity. Furthermore, they have, and are more than capable of sharing, ideas on these topics which can move them towards social action.

NAEYC and NCTM (2010) advocate for an integrated approach to mathematics learning with young children, and TMfSJ serves to provide such an approach. Children were not only involved in construction knowledge of mathematics, but through the lessons were developing knowledge related to other areas such as social studies and literacy. Children enter into school varying levels of mathematics understanding, and the mathematics knowledge they work to develop prior to the entrance of the elementary grades supports later achievement in areas such as literacy (Schoenfeld & Stipek, 2011). The children I worked with were no different; coming to our school with a variety of mathematical experiences. TMfSJ served as a way that I could support children in making connections between mathematics and their lives. For those who had less content knowledge, they could build upon what they already had by working through the mathematics evident in our lessons. Those who had a multitude of experiences could enrich and deepen their understanding by applying their knowledge to issues in their community.

In looking forward to my next steps TMfSJ in early childhood settings, I recognize the need to include the children's voice more prominently in my research. Finding ways that I can not only build off of projects children are engaged in, as was the case with the splash parks, gardens and playground lesson, but also cultivate connections to the diverse home lives of the children by working with them to bring their outside of school experiences into our study and conversations

I have seen, firsthand, that young children *can* thoughtfully engage in the conversation centered around both mathematics and social justice. They have been able to use their knowledge of mathematics to discuss social issues and advocate for change. These children developed empathy during our simulation games so that they could better understand the issues being explored and how to communicate about them. While deep down I knew this could be accomplished, I continue to be surprised as they met and even at times surpassed my expectations.

From this experience I believe that the children have built upon their existing capabilities to speak and understand the world around them. While I continue to believe they were capable to this before our time together, I see these lesson as presenting an opportunity for the children to use their understanding of mathematics to see and interpret the world. It is my hope that they have taken from our time together an understanding of why mathematics is important and how it can be useful to them in their lives. I also hope that they were able to begin to acknowledge differences which exist in the world and talk about them with others, such that a dialogue across perspectives might occur.

Mathematically, I see the progression of these learners as being something that the linear development often accepted within early childhood mathematics settings. In our

state the concept of ratios is not addressed until middle school (approximately 6th grade), however children within my lessons were able to demonstrate their understanding of ratios, through a carefully planned experience which presented the concept in a real world context (child hunger) and with concrete tools (people counters in two colors). Building pre-requisite knowledge of the mathematics being referenced in social justice issues remains vital so that children can see how the mathematics helps to frame the issues being presented. As teachers we need to reflect upon the mathematics we feel children are capable of understanding, but be willing to look beyond what we find in our standards or commonly used linear pathways of mathematical learning which may leave off concepts that can be understood within context.

These ideas circle back to knowing the children within our care. Working to gain insight from families about the FoK and outside of school experience children bring with them as well as providing children a voice in the identification of issues and concerns they feel are relevant to them, their families and communities is critical in moving forward with this work. Furthermore, children's assistance in planning learning experiences which blend their inquiries, our collective community knowledge and content learning can position children to hold a place of power in their education and afford the opportunity for educators to learn from and alongside them.

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APPENDIX A

IRB CONSENT- CHILDREN

Study ID:Pro00026848 Date Approved: 6/20/2016 Expiration Date: 6/20/2017



Parental Permission for Children to Participate in Research Involving Minimal Risk Information for parents to consider before allowing your child to take part in this research study

Pro # 26848

The following information is being presented to help you and your child decide whether or not your child wishes to be a part of a research study. Please read this information carefully. If you have any questions or if you do not understand the information, we encourage you to ask a member of the research team.

We are asking you to allow your child to take part in a research study called:

Early Childhood Mathematics Through a Social Justice Lens: An Autoethnography

The person who is in charge of this research study is Jennifer Ward, this person is called the Principal Investigator. However, other research staff may be involved and can act on behalf of the person in charge. She is being guided in this research by Dr. Sophia Han

The research will be conducted at the USF Preschool for Creative Learning.

Purpose of study:

The purpose of this study is to explore the experiences of an early childhood educator teaching mathematics with a social justice lens. This means that children will be engaged in mathematics learning that simultaneously addresses elements of fairness and equity within society. Although the purpose of the study is focused on the experiences of the Principal Investigator, the project will include video recordings of your child working on classroom tasks, as well as samples of children's work. In the course of taping, with your permission, your child may appear on the video recordings.

The video recordings will be used for the purposes of the research and for improving training of in-service teachers and pre-service teachers. The video recordings also may be shared at national or international professional conferences. The recordings will not appear on the Internet or in other public settings. Any samples of student work that are collected for this study will not contain the student's last name.

Why is your child being asked to take part?

We are asking your child to take part in this research study because he/she is attending the summer enrichment camp at the USF Preschool for Creative Learning.

Study Procedures:

If your child takes part in this study, s/he will be asked to:

Work with the Principal Investigator to simultaneously explore mathematics content while engaging in discussions and advocacy projects around social justice issues. These discussions may include such topics as fairness and equality versus equity, access to fresh food within the community, and/or location and size of public play areas. In doing so, appropriate mathematics concepts will be interwoven such that children are using mathematics understanding to make sense of these topics. The details of the discussion will ultimately be determined by the children within the study. Data collection will take between 4 to 8 weeks and have children engaging in 10-12 lessons connecting mathematics and social justice. Although the focus of the study is on the Principal Investigator's experiences, children will engage in learning mathematics content related to their age level learning standards.

- All documents containing identifying information will be kept in separate locked filing cabinets at all times when not in active use.
- Electronic data containing identifying information will be saved to a password protected file with access restricted to the research team.

Research records will be retained for at least 5 years after the completion of the research.

Total Number of Participants

About 40 children and 4 other teachers may take part in this study at the USF Preschool for Creative Learning.

Alternatives / Voluntary Participation / Withdrawal

If you decide not to let your child take part in this study, that is okay. Instead of being in this research study your child can choose not to participate. You should only let your child take part in this study if both of you want to. You or child should not feel that there is any pressure to take part in the study to please the study investigator or the research staff.

If you decide not to let your child take part:

If you choose not to give your permission, then your child will still participate in the classroom instruction as usual. S/He will just be seated out of camera range, and we will not collect your child's classwork for the study. Children will still participate in other classroom activities as usual.

You can decide after signing this informed consent form that you no longer want your child to take part in this study. We will keep you informed of any new developments which might affect your willingness to allow your child to continue to participate in the study. However, you can decide you want your child to stop taking part in the study for any reason at any time. If you decide you want your child to stop taking part in the study, tell the study staff as soon as you can.

Benefits

We do not know if your child will gain any benefits by taking part in this study.

Children will have the opportunity to demonstrate knowledge and understanding, create artifacts, collaborate with peers and engage in mathematics to understand the world and advocate for social equity.

Risks or Discomfort

There are no known risks to those who take part in this study.

Compensation

Your child will receive no payment or other compensation for taking part in this study.

Costs

It will not cost you anything to let your child take part in the study.

Privacy and Confidentiality

We will keep your child's study records private and confidential. Certain people may need to see your child's study records. Anyone who looks at your child's records must keep them confidential. These individuals include:

- The research team, including the Principal Investigator, study coordinator, research nurses, and all other research staff.
- Certain government and university people who need to know more about the study, and individuals who provide oversight to ensure that we are doing the study in the right way.
- Any agency of the federal, state, or local government that regulates this research. This includes the Office for Human Research Protection (OHRP).
- The USF Institutional Review Board (IRB) and related staff who have oversight responsibilities for this study, including staff in USF Research Integrity and Compliance.
- The sponsors of this study and contract research organization

We may publish what we learn from this study. If we do, we will not include your child's name. We will not publish anything that would let people know who your child is.

You can get the answers to your questions, concerns, or complaints.

If you have any questions, concerns or complaints about this study, call Jennifer Ward at 585-506-2370

If you have questions about your child's rights, or have complaints, concerns or issues you want to discuss with someone outside the research, call the USF IRB at (813) 974-5638 or contact by email at RSCH-IRB@usf.edu.

Consent for My Child to Participate in this Research Study

I freely give my consent to let my child take part in this study I understand that by signing this form I am agreeing to let my child take part in research. I have received a copy of this form to take with me.

Signature of Parent of the Child Taking Part in Study

Date

Printed Name of Parent of the Child Taking Part in Study

Statement of Person Obtaining Informed Consent

I have carefully explained to the person taking part in the study what he or she can expect from their child's participation. I confirm that this research subject speaks the language that was used to explain this research and is receiving an informed consent form in their primary language. This research subject has provided legally effective informed consent.

Signature of Person Obtaining Informed Consent

Date

Printed Name of Person Obtaining Informed Consent

APPENDIX B

IRB CERTIFICATION COMPLETION

Office of Research & Innovation : SOURCE



APPENDIX C

IRB APPROVAL



RESEARCH INTEGRITY AND COMPLIANCE
Institutional Review Boards, FWA No. 00001669
12901 Bruce B. Downs Blvd., MDC035 • Tampa, FL 33612-4799
(813) 974-5638 • FAX (813) 974-7091

June 21, 2016

Jennifer Ward, MA
Teaching and Learning
Tampa, FL 33612

RE: Expedited Approval for Initial Review

IRB#: Pro00026848

Title: Early Childhood Mathematics Through a Social Justice Lens: An Autoethnography

Study Approval Period: 6/20/2016 to 6/20/2017

Dear Ms. Ward:

On 6/20/2016, the Institutional Review Board (IRB) reviewed and **APPROVED** the above application and all documents contained within, including those outlined below.

Approved Item(s):

Protocol Document(s):

[IRB- Dissertation 5.11.16 v 1.docx](#)

Consent/Assent Document(s)*:

[Ward Parent Permission 6.20.16 v1.docx.pdf](#)

[IRB Verbal Assent.docx](#)

*Please use only the official IRB stamped informed consent/assent document(s) found under the "Attachments" tab. Please note, these consent/assent document(s) are only valid during the approval period indicated at the top of the form(s). Verbal assent is not stamped.

It was the determination of the IRB that your study qualified for expedited review which includes activities that (1) present no more than minimal risk to human subjects, and (2) involve only procedures listed in one or more of the categories outlined below. The IRB may review research through the expedited review procedure authorized by 45CFR46.110. The research proposed in this study is categorized under the following expedited review category:

(6) Collection of data from voice, video, digital, or image recordings made for research purposes.

(7) Research on individual or group characteristics or behavior (including, but not limited to, research on perception, cognition, motivation, identity, language, communication, cultural beliefs or practices, and social behavior) or research employing survey, interview, oral history, focus group, program evaluation, human factors evaluation, or quality assurance methodologies.

Study involves children and falls under 45 CFR 46.404: Research not involving more than minimal risk.

As the principal investigator of this study, it is your responsibility to conduct this study in accordance with IRB policies and procedures and as approved by the IRB. Any changes to the approved research must be submitted to the IRB for review and approval via an amendment. Additionally, all unanticipated problems must be reported to the USF IRB within five (5) calendar days.

We appreciate your dedication to the ethical conduct of human subject research at the University of South Florida and your continued commitment to human research protections. If you have any questions regarding this matter, please call 813-974-5638.

Sincerely,

A handwritten signature in black ink, appearing to read 'Kristen Salomon', followed by a horizontal line.

Kristen Salomon, Ph.D., Vice Chairperson
USF Institutional Review Board

APPENDIX D

LESSON PLANNING TEMPLATE

Essential Question:			Vocabulary:
Social Justice Focus:			Mathematic Focus:
<u>Opening (Engage):</u> <u>Framing social justice issues:</u>			<u>Pair/Share HOT Questions:</u>
<u>*Building Understanding (Whole Group Exploration-Core):</u> <u>Unpacking social justice issues:</u>			<u>Pair/Share HOT Questions:</u>
<u>Independent /Small Group Practice (Differentiation):</u>			<u>Lesson Closure:</u> (10 mins)
<u>Reteach:</u>	<u>Core:</u>	<u>Enrich:</u>	
<u>Application of mathematics:</u> <u>Applying learning about social justice issues:</u>			
<u>Evidence of Learning:</u>			

APPENDIX E

INFORMAL LESSON

7.6.16

EQ: How can we represent data to compare it? (Pre-assessment of counting and comparing 10-15)

Students roll dice and build number with tools, compare to peers
Use terms- greater than, less than, fewer than, more than, and/or equal to

Discuss how many more/less/fewer/greater

V. Cognitive Development and General Knowledge

A. Mathematical Thinking

a. Number Sense

1. Demonstrates understanding of one-to-one correspondence **Benchmark**

a: Child demonstrates one-to-one correspondence when counting.

Benchmark b: Child demonstrates one-to-one correspondence to determine if two sets are equal.

2. Shows understanding of how to count and construct sets **Benchmark a:**

Child counts sets in the range of 10 to 15 objects. **Benchmark b:** Child constructs sets in the range of 10 to 15 objects.

3. Shows understanding by participating in the comparison of quantities

Benchmark a: Child compares two sets to determine if they are equal.

Benchmark b: Child compares two sets to determine if one set has more.

Benchmark c: Child compares two sets to determine if one set has less.

Benchmark d: Child determines one set of objects is a lot more than another set of objects.

4. Assigns and relates numerical representations among numerals (written), sets of objects, and number names (spoken) from zero to 10

APPENDIX F

EQUAL VS. EQUALITY LESSON

7.7.16

Social Justice launch

Show image of baseball game with three children watching to unpack equity vs. equality. Only show first 2 images.

EQUALITY VERSUS EQUITY



In the first image, it is assumed that everyone will benefit from the same supports. They are being treated equally.



In the second image, individuals are given different supports to make it possible for them to have equal access to the game. They are being treated equitably.



In the third image, all three can see the game without any supports or accommodations because the cause of the inequity was addressed. The systemic barrier has been removed.

Only focus on first two images-

Image	Guiding questions
1	<p>What do you notice about the people? The boxes?</p> <ul style="list-style-type: none"> • None in the number of boxes is equal- equality everyone is getting the same amount. <p>How does each person feel in the photo- crop to focus in on each person? Which person would you want to be and why? Why do you think it is a problem that everyone got one box? How could we make it so everyone could see the game? (launch into students demonstrating with play-doh, blocks, drawing or legos)</p>
2	<p>What do you notice about boxes and people here?</p> <p>How do the people feel here- especially the smallest person. Largest person</p> <ul style="list-style-type: none"> • Everyone can see now- is this better or worse than the first image? Why do you think that?

APPENDIX G

CONSTRUCTIONS OF EQUITY/JUSTICE



APPENDIX H

SPLASH PARKS, GARDENS, AND PLAYGROUNDS LESSON

<p>Essential Question: Does your race impact the amount of money you can make?</p>	<p>Vocabulary: more/ less, # 0-9</p>
<p>Social Justice Focus: Income Variance by Race</p>	<p>Mathematic Focus: number ID, proportional reasoning,</p>
<p><u>Opening (Engage):</u></p> <p>Ask students to examine spinner Examine piles of money- which has more? less?</p> <p><u>Framing social justice issues:</u></p> <p>Review food insecurity from last meeting- highlight children's hypothesis that some people can't afford food.</p> <p>Present graphic to students to illustrate the number of people that make below, at or above average amount of pay by race.</p>	<p><u>Pair/Share HOT Questions:</u> What do you notice about spinners? (#s, frequency of each #, size of each # area).</p> <p>If you spun the spinner would you have an equal chance of getting each number?</p> <p>Which pile of money would you want to make and why?</p>
<p><u>*Building Understanding (Whole Group Exploration- Core):</u></p> <p>Day 1: Play game for practice- only spinning and getting that amount of money.</p> <p>Spin spinner- make that amount of money. Use cubes to compare the quantity obtained.</p> <p>Day 2: add social justice element of race Frame jobs- all have same job</p> <p>Students will draw a person to represent their race (W- yellow, B-blue, H-red, A-green) Spin spinner to determine a number- number spun will impact how much you make (\$1 vs. \$2)</p> <p>W/ A: Always make \$2 B/ H: 0-7 makes \$2, 8-9 makes \$1</p>	<p><u>Pair/Share HOT Questions:</u></p> <p>Questions centered around the comparison of numbers</p> <p>How did it feel to make less than your peers?</p>

<p><u>Unpacking social justice issues:</u></p> <p>Unpack the idea of making less money than peers because of the "color/ race".</p>	
<p><u>Application of mathematics:</u></p> <p>Game play</p> <p><u>Applying learning about social justice issues:</u></p> <p>Children produce a haiku deck about experience and income vs. race</p>	
<p><u>Evidence of Learning:</u></p> <p>Observation of game play, photo documentation, student verbalization of understanding</p>	

APPENDIX I

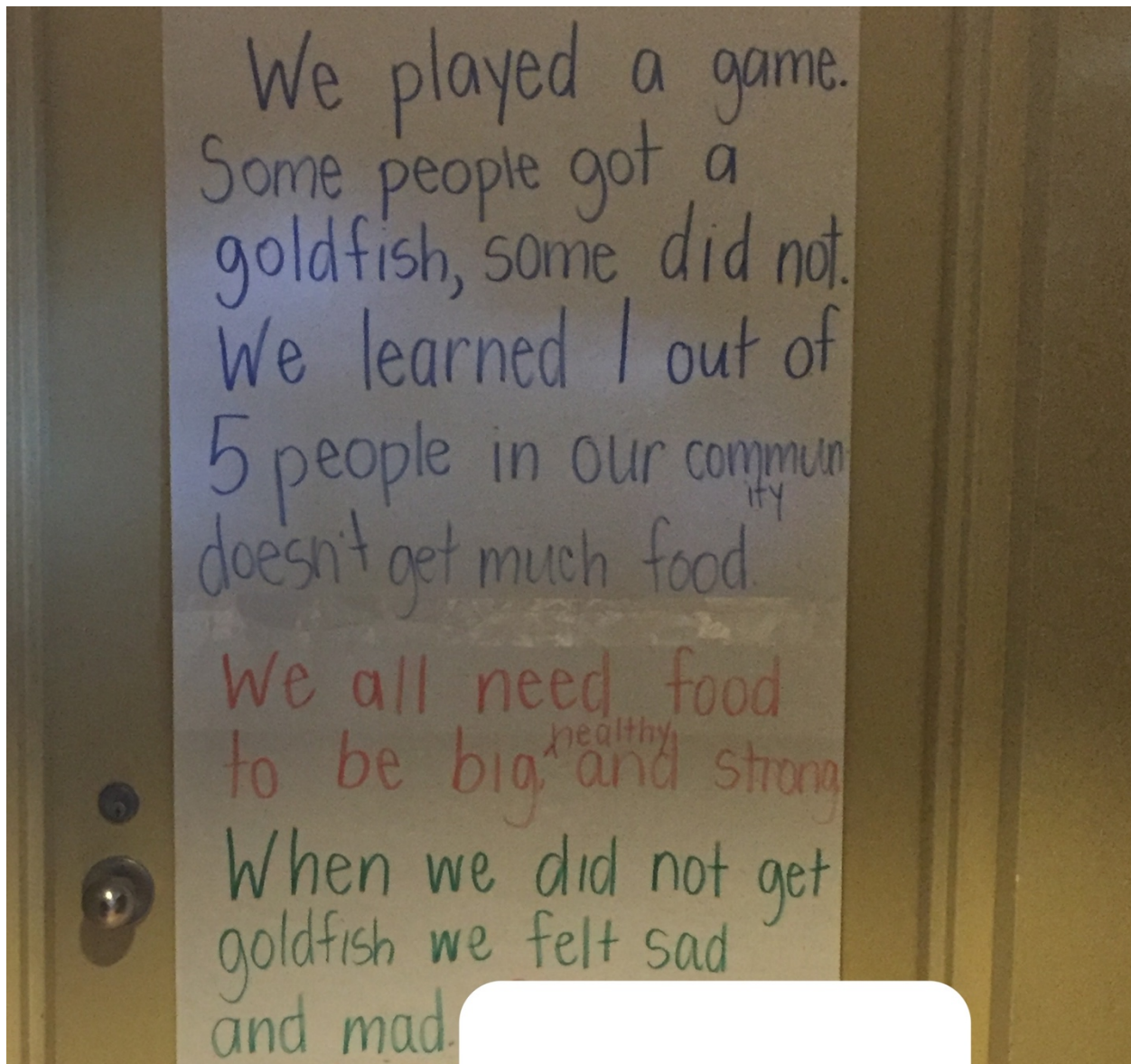
CHILD HUNGER LESSON

<p>Essential Question: How does it feel when you lack access to food?</p>	<p>Vocabulary: add, join, in all, compare, more, less, greater, fewer</p>						
<p>Social Justice Focus: Food Desserts in Our Area</p>	<p>Mathematic Focus: +1, comparing</p>						
<p><u>Opening (Engage):</u></p> <p>Show children game board (simulated plate with meal sections) or bowls/ cups to simulate stomach.</p> <p><u>Framing social justice issues:</u></p> <p>In our community 1 in 5 kids do not have access to food. Create a model with the people counters to demonstrate the statistic.</p>	<p><u>Pair/Share HOT Questions:</u></p> <p>Where do you typically eat every day? Where does your food come from?</p> <p>How many times a day do you usually eat?</p>						
<p><u>*Building Understanding (Whole Group Exploration-Core):</u></p> <p>review the numbers represented in the bags (1-15) depending on the student. (varying representations- ten frame, tally, dot, digit)</p> <p>Children will pull a number from bag and add to their mat/bowl/jar depending on the following scheme:</p> <ul style="list-style-type: none"> • Spin a 1, 6, 11: cannot add anything • Spin 2-5, 7-10, 12-15: can add a gem <p><u>Unpacking social justice issues:</u></p> <p>Ask questions during game play regarding how children feel when they are unable to get food.</p> <p>(Repeat DAY 2 Briefly)</p>	<p><u>Pair/Share HOT Questions:</u></p> <p>What number did you get? How do you know?</p> <p>How do you feel when you get to eat? When others do not? When you do not?</p> <p>How might it feel if you had multiple times you were unable to eat?</p>						
<p style="text-align: center;">Independent /Small Group Practice (Differentiation):</p>	<p><u>Lesson Closure:</u> (10 mins)</p>						
<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 33%; border-right: 1px dashed black; padding: 5px;"><u>Reteach:</u></td> <td style="width: 33%; border-right: 1px dashed black; padding: 5px;"><u>Core:</u></td> <td style="width: 33%; padding: 5px;"><u>Enrich:</u></td> </tr> <tr> <td style="border-right: 1px dashed black; padding: 5px;">Focus on numbers 1-10 (R, N)</td> <td style="border-right: 1px dashed black; padding: 5px;">1-15 (O, C, L, A, A)</td> <td style="padding: 5px;"></td> </tr> </table>	<u>Reteach:</u>	<u>Core:</u>	<u>Enrich:</u>	Focus on numbers 1-10 (R, N)	1-15 (O, C, L, A, A)		<p>Identify who was able to eat the most- who had less? Why?</p> <p>Review social justice issues</p>
<u>Reteach:</u>	<u>Core:</u>	<u>Enrich:</u>					
Focus on numbers 1-10 (R, N)	1-15 (O, C, L, A, A)						

<p>Application of mathematics: Number ID during game, counting final number of "food" items obtained.</p> <p><u>Applying learning about social justice issues: (DAY 2)</u> Work as a group to craft Letter to feeding American Tampa Bay/ Families on chart paper to display. Send letter to congressmen on FATB website.</p>		
<p>Evidence of Learning: Observation, social justice letters to Feeding America Tampa Bay</p>		

APPENDIX J

CHILD HUNGER WRITING



APPENDIX K

FINANCIAL INEQUALITIES LESSON

<p>Essential Question: Does your race impact the amount of money you can make?</p>	<p>Vocabulary: more/ less, # 0-9</p>
<p>Social Justice Focus: Income Variance by Race</p>	<p>Mathematic Focus: number ID, proportional reasoning,</p>
<p><u>Opening (Engage):</u></p> <p>Ask students to examine spinner Examine piles of money- which has more? less?</p> <p><u>Framing social justice issues:</u></p> <p>Review food insecurity from last meeting- highlight children's hypothesis that some people can't afford food.</p> <p>Present graphic to students to illustrate the number of people that make below, at or above average amount of pay by race.</p>	<p><u>Pair/Share HOT Questions:</u> What do you notice about spinners? (#s, frequency of each #, size of each # area).</p> <p>If you spun the spinner would you have an equal chance of getting each number?</p> <p>Which pile of money would you want to make and why?</p>
<p><u>*Building Understanding (Whole Group Exploration-Core):</u></p> <p>Day 1: Play game for practice- only spinning and getting that amount of money.</p> <p>Spin spinner- make that amount of money. Use cubes to compare the quantity obtained.</p> <p>Day 2: add social justice element of race Frame jobs- all have same job</p> <p>Students will draw a person to represent their race (W-yellow, B-blue, H-red, A-green) Spin spinner to determine a number- number spun will impact how much you make (\$1 vs. \$2)</p> <p>W/ A: Always make \$2 B/ H: 0-7 makes \$2, 8-9 makes \$1</p> <p><u>Unpacking social justice issues:</u> Unpack the idea of making less money than peers because of the "color/ race".</p>	<p><u>Pair/Share HOT Questions:</u></p> <p>Questions centered around the comparison of numbers</p> <p>How did it feel to make less than your peers?</p>

<u>Application of mathematics:</u> Game play	
<u>Applying learning about social justice issues:</u> Children produce a haiku deck about experience and income vs race	
<u>Evidence of Learning:</u> Observation of game play, photo documentation, student verbalization of understanding	