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Critical Early Childhood Mathematics For Children of Color

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CRITICAL EARLY CHILDHOOD MATHEMATICS FOR CHILDREN OF COLOR

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Abstract: Early Childhood mathematics education often focuses only on counting, cardinality, and pattern recognition. Through a university/school partnership, we detail how a veteran prekindergarten teacher of color, working in a school serving a community of color in the United States, utilized democratic and inquiry-based early childhood pedagogical frameworks to mathematically empower her 4 and 5-year-old students. In this project session, we focus on the impact that a critical approach to mathematics education had on this veteran teacher's school and practice, with reflective discussion led by the teacher herself.

INTRODUCTION

Within the United States, the research on critical mathematics teaching practices that humanize and empower children is only just emerging, particularly in the area of early childhood education. Parks (2015) and Wager (2013) have exposed the current obsession with early childhood numeracy, which is heavily pushed onto children of color, as just another mechanism to limit children's creativity and inhibit the development of rich mathematical strategies. Instead, these scholars offer play-based mathematical learning as an antidote to the standards and accountability-focused obsession that has infiltrated U.S. schools. Ward (2017) and Authors (2016; 2017) take this construct of play-based mathematics one step further, connecting it to critical pedagogy. We argue that even the youngest thinkers can utilize mathematics as a critical tool of inquiry, that exposes and confronts oppression.

But how do Prekindergarten teachers actually enact and use critical pedagogy within their practice in conjunction with the development of rich mathematical strategies and creativity? In this session, we outline a three-month professional development partnership with an entire elementary school serving a low-income community of color in the United States of America. We highlight how this Cognitively Guided Instruction (CGI) (Carpenter et al.,1999) based professional development empowered a veteran prekindergarten teacher to try out new practices in her approach to mathematics teaching. And, we reflect on how these practices impacted not only the children's mathematical learning, but also the beliefs and practices of the teacher herself. Further we will present critical units 1 designed to put these beliefs and practices into action during the 2018-2019 school year.

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FRAMEWORK

This session details a professional development university/school partnership in Ohio, a large, midwestern state in the United States, that focused on supporting early childhood and elementary teachers to embrace and enact critical mathematics pedagogy. In general, when it comes to the mathematics learning occurring in early childhood classrooms, there is a tendency to focus on the development of single concepts or skills (eg. counting, identifying coins) rather than building the foundations for deep mathematical thinking and conceptual understanding. This tendency can limit students' development of reasoning and mathematical communication skills (such as argumentation and justification of ideas) that are keys to mathematical achievement (Papic, 2013). The state of Ohio's learning and development standards for Prekindergarten separate mathematics into a general knowledge category and, in fact, consist of a list of single concepts and skills (Ohio Department of Education, 2011)that students are meant to develop on a trajectory towards reaching Kindergarten content standards, but do not include underlying mathematical processes or communication skills . This inherently limits both the quality of instruction and the content students have access to and requires teachers to think beyond mandated standards if they are to promote mathematical thinking that can truly impact students' mathematical trajectories.

This professional development partnership intended to help teachers utilize and innovative research-based mathematics teaching practices. These practices served to mathematically empower students at an elementary school serving a predominantly low-income, Black community. In addition to CGI, we also engaged in teacher education experiences that focused on rehumanizing mathematics (Gutierrez, 2018), connecting mathematics identities to racial identities (Aguirre, Mayfield-Ingram, & Martin, 2014), and play-based early childhood mathematical thinking (Parks, 2015).

METHOD

Background

In this professional development partnership, two teacher educators worked with a group of 22 early childhood and elementary mathematics teachers over three months. The first teacher educator is a veteran Latina bilingual elementary teacher who primarily served Latinx students in whom she hoped to instill pride in themselves, their families, their language and their culture. To that end, the mathematics class centered student thinking and was deliberately structured to be culturally affirming--centering issues of social justice with CGI strategies employed deliberately in order to foment mathematical community (Author, 2018).

The second teacher educator is a veteran elementary mathematics teacher educator who identifies as Asian American and whose research focuses on ways to support and empower teachers of color.

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In this session, we focus on working with one veteran prekindergarten teacher who has worked relentlessly to empower her children of color to recognize racism, confront oppression, and continually love and care for their world and their community. This teacher accomplishes this through allowing children to make decisions about what kinds of mathematics they want to learn and how it connects to their community knowledge (Authors, 2017) and using mathematics for her children to unpack critical details within U.S. Black History (Authors, 2016).

Project Enactment

This partnership involved teachers collecting video from their classrooms for detailed feedback and discussion, the observation of model lessons enacted by the primary teacher educator, and opportunities to co-plan and co-teach with the primary teacher educator. The detailed work between the primary teacher educator and the prekindergarten teacher focused on four goals: (1) Moving from rules and memorization to centering critical thinking and deep understanding; (2) Belief in the tremendous capacity of young children and enacting new strategies that maximize that capacity; (3) Moving from seeing some children as being more capable of problem solving and critical thinking to serving the whole class; and (4) Envisioning mathematics beyond dictated standards and within units that emphasize social justice themes and student interests.

With an understanding of the politics of our curriculum, the veteran educator was searching for a method which will teach all of her students and produce high levels of growth. Since, we believe that students have a high capacity to learn at this age and are excited and eager to learn, the veteran educator in this project consistently added to the prescribed curriculum out of an ethical sense that student's learning opportunities should not be limited due to politics.

This project will follow attempts to add student thinking-centered mathematics and problem-solving within critical and child-interest centered units (e.g., AfroLatinx identity; music, rhythm and movement) throughout the course of a year, documenting both the shift in teacher pedagogy and practice and the outcomes in terms of student learning and engagement.

DISCUSSION

We approach this work as U.S.based early childhood mathematics teachers and educators who would like to learn more about how to enact critical stances from scholars outside the U.S. Our experience has shown us that early childhood mathematics education in the U.S. is heavily skills driven, which does not acknowledge the brilliance and critical capacity of young children, particularly children of color.

We hope that this session will only allow us to share the work and thinking we have engaged in through forming university/school-based partnerships with the expressed purpose of empowering children of color. We also hope this session will allow us to

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engage in deep thinking and discussion around ways to align our work with global constructs, particularly philosophies in early childhood education that come from non-western and non-Eurocentric images of the child.

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